UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 5

Record of Decision

for

Amcast Industrial Corporation

Cedarburg, WI

EPA ID No. WIN000510210

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ACRONYMS

µg/L	microgram per liter
amsl	above mean sea level
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirement
AST	Above-ground Storage Tank
BFPP	Bona Fide Prospective Purchaser
bgs	below ground surface
CDI	Chronic Daily Intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm	Centimeter
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CSM	Conceptual Site Model
ELCR	Excess Lifetime Cancer Risk
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
ES	Enforcement Standard
ESV	Ecological Screening Value
FS	Feasibility Study
GAC	Granular Activated Carbon
HI	Hazard Index
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
IC	Institutional Control
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
NCP	National Contingency Plan
ng/L	nanogram per liter
O&M	Operation and Maintenance
OSR	Off-Site Rule
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCP	Pentachlorophenol
PFAS	Per- and Poly-fluoroalkyl Substances
ppm	parts per million
PRB	Permeable Reactive Barrier
PRG	Preliminary Remediation Goal

RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act
SF	Slope Factor
Site	Amcast Industrial Corporation Superfund Site
SVOC	Semi-Volatile Organic Compound
SWAC	Surface-Weighted Average Concentration
TBC	To Be Considered
TSCA	Toxic Substances Control Act
UCL	Upper Confidence Limit
USC	United States Code
USGS	United States Geological Survey
UST	Underground Storage Tank
UU/UE	Unlimited Use/Unrestricted Exposure
VI	Vapor Intrusion
VOC	Volatile Organic Compound
WDNR	Wisconsin Department of Natural Resources
WGNHS	Wisconsin Geological and Natural History Survey

PART 1: DECLARATION

This part summarizes the information presented in this Record of Decision (ROD) and includes the authorizing signature of the United States Environmental Protection Agency (EPA) Region 5 Superfund and Emergency Management Division Director.

A. Site Name and Location

Site Name: Amcast Industrial Corporation Superfund Site
Site Location: Cedarburg, Ozaukee County, Wisconsin

Superfund Identification Number: WIN000510210

B. Statement of Basis and Purpose

This ROD presents the Selected Remedy for Operable Unit 1 (OU1) for the Amcast Industrial Corporation Superfund Site (the Site), which was chosen by the United States Environmental Protection Agency (EPA) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §§ 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document addresses contaminated soils, sewers, and sediments (OU1), as well as an interim remedy for Sitewide groundwater (OU2). EPA will propose and select a final remedy for OU2 in a future decision document. EPA intends to implement and assess the effectiveness of the OU1 remedy and collect additional groundwater data before implementing the OU2 remedy.

This decision is based on the Administrative Record (AR) file for the Site, which has been developed in accordance with Section 113(k) of CERCLA, 42 U.S.C. § 9613(k). The AR Index (Attachment 3) identifies each of the items comprising the AR upon which the Selected Remedy is based. The AR is available for review at the following informational repositories:

Cedarburg Public Library
W63N589 Hanover Ave, Cedarburg, WI

Cedarburg City Hall
W63N645 Washington Ave, Cedarburg, WI

EPA Region 5, 7th Floor Records Center
77 W. Jackson Blvd, Chicago, IL

Information on the Site can also be accessed on-line through EPA's website at www.epa.gov/superfund/amcastindustrial.

The Wisconsin Department of Natural Resources (WDNR) has indicated concurrence with the Selected Remedy on August 17, 2023. The state's concurrence letter is included in Attachment 4.

C. Assessment of Site

EPA has determined that the response actions selected in this ROD are necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants into the environment.

D. Description of Selected Remedy

The Selected Remedy is broken into eight components based on Site sub-areas, and includes the following major remedy components:

Amcast North – AMN-2 (modified): Sampling of concrete and pressure washing or excavation of contaminated concrete, excavation of contaminated soil, with off-site disposal and site restoration;

Residential Yards – RY-3: Excavation of contaminated soil, with off-site disposal and backfilling with clean fill and yard restoration;

Amcast South – AMS-4: Excavation of contaminated soil, with off-site disposal and backfilling with clean fill;

Quarry Pond – QP-4: Contaminated sediment dredging, bank soil excavation, with off-site disposal, followed by placement of a residual management layer and site restoration;

Wilshire Pond – WP 2/3: Berm sampling, contaminated sediment dredging and bank soil excavation, with offsite disposal and backfilling of banks and berms as needed with clean fill, followed by site restoration;

Amcast North Storm Sewers – SSN-3: Pressure washing sewers, removal, or abandonment of sections of sewer piping, with off-site disposal and backfill with site restoration;

Amcast South Storm Sewers – SSS-4: Pressure washing sewers, removal of storm sewer piping, excavation of contaminated backfill, with off-site disposal and backfill with site restoration;

Groundwater (interim remedy) – GW-2: Institutional controls and groundwater monitoring.

The Selected Remedy is expected to achieve substantial risk and mass reduction through the actions described above by sub-area. The total cost for all components of the Selected Remedy is $39,571,597.

E. Statutory Determinations

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, but it will take more than five years to attain remedial action objectives for fish consumption and all cleanup levels, a statutory review will be conducted within five years after initiation of the on-Site construction work to ensure that the remedy is, or will be, protective of human health and the environment.

F. Data Certification Checklist

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for this site. See Attachment 3 for the Administrative Record Index.

- Chemicals of concern (COCs) and their respective concentrations. (Page 14)
- Baseline risk represented by the COCs. (Page 16)
- Cleanup levels established for COCs and the basis for these levels. (Page 20)
- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and ROD. (Page 13)
- Potential land use that will be available at the Site as a result of the Selected Remedy. (Page 13)
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected. (Page 57)
- Key factor(s) that led to selecting the remedy. (Page 51)

G. Support Agency Acceptance

The WDNR, as the state support agency, concurs with the Selected Remedy. The State's concurrence letter is included in Attachment 4.

H. Authorizing Signature

DOUGLAS BALLOTTI

Digitally signed by DOUGLAS BALLOTTI
Date: 2023.09.25 10:01:36 -05'00'

Douglas Ballotti
Director, Superfund & Emergency Management Division
EPA Region 5

PART 2: DECISION SUMMARY

A. Site Name, Location, and Description

The Site is located in the City of Cedarburg, Ozaukee County, Wisconsin. The Site is located on the south side of Cedarburg at N39 W5789 Hamilton Road, with portions of the property located on the north and south sides of Hamilton Road and west of Cedar Creek (Figure 1). The Amcast Site includes the Amcast North and South properties, the residential properties adjacent to Amcast North, Wilshire Pond (a stormwater retention basin), Quarry Pond at Zeunert Park, groundwater, and storm sewers.

National Superfund Identification Number: WIN000510210

Source of cleanup monies: Superfund Trust Fund

B. Site History and Enforcement Activities

1. Amcast North

A detailed history of operations at the Site prior to 2001 is not available. While the exact ownership dates are unknown, historical photography shows a portion of a manufacturing facility having been constructed in 1963 that is assumed to have been owned by Meta-Mold, who owned Amcast South in 1963. In 2001, the aluminum die-casting process observed at Amcast North included temporary storage of aluminum ingots, prior to melting in one of several heating furnaces. After melting, the aluminum was transferred into a holding furnace that metered aluminum into individual dies for casting parts. Once the die casting was complete, the material was cooled by air and/or water and transferred into an oven to be heat treated. The part was then inspected and shipped offsite for distribution to customers. Dies were reused by entering a blast booth that used plastic media to remove old coatings from the die. The die was then heated and re-coated.

Three above-ground storage tanks (ASTs) were present on the Amcast North property during a 2001 Site inspection conducted by Sigma Environmental. A propane AST was located adjacent to the railroad on the northwestern portion of Amcast North, and an AST containing liquid nitrogen was located near the partial basement. A 10,000-gallon AST was also reported at the southwestern portion of the northern facility that was used to collect and process oily wastes. Wastewater was pumped from the facility and stored in the AST for disposal; some of the drains and sumps in the manufacturing plant were also reportedly routed to this AST. No ASTs were present at Amcast North during subsequent site visits. Two bermed areas were also noted in the basement for storage of drummed liquid products. Glycol and water tanks associated with the aluminum casting process were stored in one bermed area, while petroleum and other liquid products were stored in a separate bermed area. The following chemicals were stored in secondary containment on the property in 2001: glycol- and petroleum-based hydraulic fluids, petroleum-based

die inspection fluid, oil- and vegetable-based cutting fluids, Stoddard Solvent, mineral spirits, and naphtha.

The Amcast North property was purchased by Oliver Fiontar LLC in late 2018. Demolition of Amcast North manufacturing buildings was completed in December of 2020. The developer plans to redevelop the Site for residential and commercial use.

2. Amcast South

The Amcast South property is the location of the former Meta-Mold Aluminum Company, an aluminum die-cast facility that began operating as early as 1937. Dayton Malleable Iron, Inc. acquired shares of the Meta-Mold Aluminum Company in 1955, which, in turn, became a division of Dayton Malleable in 1973. In 1993, Dayton Malleable changed its name to Amcast Industrial Corporation. Amcast Industrial Corporation was a former manufacturer of aluminum castings, primarily for the automotive industry.

The original foundry facility was located east of the present-day office building on the Amcast South property and was demolished sometime between 1975 and 1980. There were ASTs located south-southeast of the former Quonset hut on Amcast South. The ASTs were reportedly used for the storage and distribution of fuel oil for heating the aluminum casting facilities on the Amcast South and North properties and were removed from the Site between April 1980 and April 1985. A 14,000-gallon underground storage tank (UST) was also present on Amcast South, in an unspecified location, and reportedly abandoned in place by filling with an inert material (sand/gravel/slurry).

An area on the southern half of the property was depressed in elevation by at least 5 to 10 feet from the surrounding land, based on a 1959 topographic map. During the 1970s, the low-lying area, herein referred to as the former disposal area, received material from foundry casting operations and the City of Cedarburg. The fill materials encountered during previous investigations included silt and sand with variable amounts of gravel and other debris such as brick, metal, wood, concrete, slag, asphalt, a “white powdery substance,” and visible staining and odors. Interviews with former facility personnel report fill materials included debris from previous Site structures, general office and/or factory refuse (such as paper and wood), scrap metals, and possibly spent oils such as hydraulic fluids. While the “white powdery substance” was not conclusively identified, a sample was analyzed for the presence of asbestos, and no asbestos was identified in the sample. Spent hydraulic fluids were also reportedly applied to the former gravel parking lot for dust control; the parking lot is now paved with asphalt.

The Amcast South property was purchased by Oliver Fiontar LLC in late 2018. Demolition of the Amcast South Quonset hut was completed in December of 2020. The developer plans to redevelop the Site for residential and commercial use.

3. Polychlorinated Biphenyl Use at Site

Several processes at Amcast North and South used oils and other fluids containing polychlorinated biphenyls (PCBs). Previous reports from 1990 summarizing WDNR records indicated that specific products used onsite included Pydraul 312, Pydraul 312A, Pydraul 312C, and Amitron cutting fluid. A letter from Monsanto Company to Amcast Industrial Corporation's former legal counsel, dated July 13, 1990, indicates sales of 23,000 pounds of PCB-containing Pydraul 312 to the facility between 1966 and 1971. Pydraul 312 contained 47-48% Aroclor 1242 (a mixture of PCBs). No sale of the material was documented after 1971. PCB-based cutting fluids were historically used onsite, and some of the material was used to oil the roads on the property to reduce dust.

The summary of WDNR's project files regarding the PCB detections and the elimination of PCBs from the facility reported that in 1974, WDNR notified Amcast (Dayton Malleable, Inc. at the time) that Aroclor 1248 was found in a storm sewer manhole (location not specified) on the Amcast Site. WDNR requested that Amcast discontinue use of PCB-containing oils and determine the path of hydraulic fluid to the storm sewer. Correspondence files indicated that efforts to remove PCB-containing oils from the machine system were completed by 1976, and installation of an oil/water separator and modifications to floor drains were completed by 1978. Discharges to the storm sewer were eliminated by 1980; cooling water from the oil/water separator was rerouted to discharge to the sanitary sewer by 1986. Effluent was within permitted limits per a 1986 compliance report. A more detailed summary of WDNR project files reviewed by Foth & Van Dyke is presented in the Preliminary Site Characterization Summary (Foth & Van Dyke 2004). Despite efforts to eliminate the presence and use of PCBs onsite, sample results from previous investigations indicate significant levels of PCBs in storm sewers on the Amcast North and South properties. Two releases to surface waters and/or the storm sewer were reported to WDNR in 1998.

4. Site Investigation and Remedy Evaluation

A Remedial Investigation (RI) was initiated at the Site by Amcast Corporation in 2003. Amcast went bankrupt after conducting some of the investigation work, and EPA took over the RI in 2009, concluding with a final RI Report in 2015. The RI included:

- Soil sampling in Amcast North, Amcast South, and the residential yards east of Amcast North;
- Sediment sampling in Quarry Pond, Wilshire Pond, and the sewer system connecting the ponds and Cedar Creek to Amcast North and South;
- Surface water and fish tissue sampling in Quarry Pond and Wilshire Pond; and
- Groundwater sampling at various locations throughout the Site.

The RI conclusions and site characterization information are summarized later in this ROD in Section E (Site Characteristics). For more detail about Site investigations, see the 2015 Final RI Report. After conclusion of the RI, EPA developed a Feasibility Study (FS) in 2020 to evaluate alternatives for the Site remedy. A Proposed Plan was then developed in 2022 and 2023 to summarize alternatives, identify EPA's preferred alternative, and request input from the public.

C. Community Participation

EPA conducted community interviews in 2011 and 2022 to better understand the community and its needs regarding the Site. These interviews were conducted with residents and local officials. EPA completed a Community Involvement Plan for the Site in April 2012 and revised the plan in December 2022.

EPA developed a Proposed Plan summarizing site history and presenting remedial alternatives between 2022 and 2023. The RI Report, Proposed Plan, and other supporting documents were made available to the public in May 2023 (see Attachment 3 for a complete list of documents in the AR Index). The notice of availability of these documents was published in the Ozaukee County News Graphic on May 11 and May 18, 2023. A public comment period was held from May 12 to June 12, 2023.

In addition, a public meeting was held in Cedarburg on May 31, 2023, to present the Proposed Plan to the local community. At this meeting, EPA gave a presentation to the community about the Site and Proposed Plan, and representatives of the EPA, the WDNR, and the Wisconsin Department of Health Services answered questions about the Site and remedial alternatives. No formal public comments were made during this meeting.

EPA's responses to the comments received from the public during the public comment period are included in the Responsiveness Summary, which is provided in Part 3 of this ROD.

D. Scope and Role of Operable Units

EPA has organized the work at this Site into two OUs:

OU1: Site soils, sediments, and sewers
OU2: Sitewide groundwater

The final remedial action for OU1 is described in this ROD, and addresses contamination present in Site soils, sediments, and sewers. Contact with these contaminated media poses a current and potential future risk to human health because EPA's acceptable risk range is exceeded.

In addition, an interim remedial action for OU2 is described in this ROD. There is no known current complete exposure pathway to contaminated Site groundwater causing unacceptable

risk, and shallow groundwater at the Site is not used for drinking water. EPA will propose and select a final remedy for OU2 in a future decision document. EPA intends to implement and assess the effectiveness of the OU1 remedy and collect additional groundwater data before implementing the OU2 remedy. It is anticipated that OU1 remedial action will mitigate current groundwater contamination in OU2.

E. Site Characteristics

1. Physical Characteristics and Demography

The Amcast Site is located along the southeastern portion of the City of Cedarburg, which is located in southeastern Wisconsin approximately 4.5 miles west of the western shore of Lake Michigan and 20 miles north of the City of Milwaukee. Cedarburg consists of a 4.3-square-mile area and has a population of 11,412 people according to 2010 U.S. Census Bureau data, with a 4.6 percent increase in population since 2000.

2. Topography

The land surface elevations range from a high of approximately 770 feet above mean sea level (amsl) near the northwestern portion of Amcast South to a low at the edge of Quarry Pond (approximately 730 feet amsl) based on the 1994 USGS Cedarburg topographic quadrangle. The Amcast South property elevation decreases to approximately 760 feet amsl along its southern boundary. The elevation range across Amcast North is approximately 760 to 750 feet amsl, and the downward slope continues across the residential area to the south and east, to a general elevation of approximately 730 feet amsl. The ground surface elevation near Wilshire Pond is at the approximate elevation of 740 feet amsl. Farther south and east, the base elevation of Cedar Creek (not its water elevation) is approximately 700 to 710 feet amsl.

3. Geology

Regional geology in Ozaukee County consists of unconsolidated deposits ranging from 0 to 600 feet thick overlying eastward dipping, Silurian-aged dolomite bedrock (Niagara formation) that is approximately 500 feet thick in the Cedarburg area (Wisconsin Geological and Natural History Survey [WGNHS] 2005). The surface elevation of Niagara dolomite in Ozaukee County ranges from approximately 600 to 900 feet, and outcrops locally at the ground surface. Underlying the dolomite in the Cedarburg area is approximately 150 feet of Maquoketa Group Shale that acts as a confining layer to deeper bedrock units.

The unconsolidated deposits consist of glacial sediments, alluvium (east of the Amcast Site along Cedar Creek), and surface marsh deposits (WGNHS 1997; 2005). Glacial material deposited in Ozaukee County includes diamicton (unsorted or poorly sorted sediment with a wide range of grain size and a fine-grained matrix deposited directly beneath glacial ice or on ice margins by mudflows and landslides that collapse off of

glacial ice slopes), and landforms from interglacial and glacial periods, including end moraines, ground moraines, outwash plains, and ice-walled lake plains (WGNHS 1997). Gravel outwash or lake deposits are found between end moraine diamicton deposits.

The subsurface materials immediately beneath the Site include a compact and uniform glacial clayey silt with some sand lenses and other discontinuities. In addition, in the Amcast South disposal area fill materials extend to depths of about 21 feet and contain soil material (silt, sand, and gravel), brick, metal filings, wood, concrete, and asphalt. A thin layer of organic-rich clayey silt up to 5 feet thick is also encountered beneath the fill or clay/silt layer(s) in some locations. Beneath the uppermost clayey silt or fill materials (and the organic layer, where present) is a fine-grained diamicton consisting of clayey silts and silty clays with some sand and/or gravel lenses. A sand unit reportedly composed of glacial outwash deposits is present beneath the diamicton and noted to be 15 feet thick at one location on Amcast North, where it is bounded below by a silt layer of unknown thickness. Below the unconsolidated units lies dolomite bedrock that outcrops on the northwestern shoreline of Quarry Pond. The RI report (2015) contains additional details on the Site geology.

4. Hydrogeology

There are three major aquifer systems within Ozaukee County in descending elevation: the unconsolidated materials that are capable of yielding water under pumping stress, the Niagara dolomite aquifer, and the sandstone aquifer (WGNHS 1980). The Maquoketa shale aquifer serves as an aquitard beneath the unconfined Niagara aquifer and the confined, deeper sandstone aquifer (WGNHS 1980). The deeper confined aquifer historically has a horizontal flow towards Lake Michigan to the east, but localized variations are possible due to pumping of high-capacity wells. Where the unconsolidated aquifer exists, it consists of the sand and gravel deposits such as outwash, alluvium, and glacial lake deposits and features within diamicton deposits that yield enough water to a residential or other relatively low-use well. Groundwater flow directions within unconsolidated deposits are expected to be toward local rivers and streams (e.g., Cedar Creek) that likely act as groundwater discharge areas.

Groundwater is encountered at the Site at depths ranging between 8 and 34 feet bgs, depending on the ground surface elevation. Monitoring wells that are screened in the shallow clay/silt are considered to be within a perched groundwater zone that is not able to yield sufficient water for residential or other use (logarithmic-average hydraulic conductivity of 4.31×10^{-4} centimeters per second). The potential direction of groundwater flow within the shallow clay/silt unit roughly coincides with the topography of the land surface, sloping toward the southeast and Quarry Pond at a relatively slow rate. Monitoring wells screened in the deeper, sandy outwash material (hydraulic conductivity of 2.08×10^{-2} centimeters per second) are considered to be part of a shallow

unconsolidated groundwater aquifer with an apparent eastern flow direction at a relatively higher estimated flow rate.

5. Surface Water Hydrology and Ecology

Surface water drains in the general direction that follows northwest to southeast topography. Quarry Pond (a former rock quarry) is situated southeast of Amcast South in Zeunert Park, with a surface water elevation of approximately 730 feet. In addition to overland flow, the pond receives storm sewer discharge from adjacent commercial areas, including the City of Cedarburg Department of Public Works and the Amcast South property. Sediment thickness in the pond ranges from 1 to 5 feet thick. A 2011 biological survey noted green sunfish and black bullhead as the dominant fish species in Quarry Pond, which has been used in the past for recreation. Currently, signs are posted around Quarry Pond advising the community not to fish, swim, or wade in the pond.

Wilshire Pond is a stormwater retention basin, not known to be used for recreation. The stormwater retention basin receives stormwater from the neighborhood to the north and west of its location including Amcast North and surrounding areas. A stormwater discharge pipe extends in a northeast direction out of Wilshire Pond, continuing toward Cedar Creek. Sediment thickness in Wilshire Pond ranges from between 0.5 and 2.9 feet. Based on the small size of the pond, its shallow water depth, periodic dry periods, and its irregular flooding regime, the pond does not appear to support much of a fish population. However, snails, other invertebrates, and thick emergent vegetation are present. Small numbers of green sunfish and golden shiner were noted during a 2011 biological survey, along with frogs/tadpoles of unknown species.

Cedar Creek flows north to south approximately 1,000 feet east of the Site and receives stormwater from Wilshire Pond in addition to the typical surface runoff from zones immediately adjacent to the Creek.

6. Nature and Extent of Contamination

Figure 2 depicts the conceptual site model (CSM) for the Amcast Site. In general, contaminants at the Amcast Site, primarily PCBs from oils used at the former die-casting facilities, were released to the offsite environment via inlets to storm sewers, wind-blown dust, and by overland flow during rain events. PCB contamination has affected soil and sediment that has accumulated in the storm sewers and in Wilshire and Quarry Ponds.

Figure 3 shows the storm sewer system associated with the Amcast Site. Storm sewers from the Amcast North property are connected to the Wilshire Pond stormwater retention basin, which drains to Cedar Creek, located east of the Site. Storm sewers from the Amcast South property connect to Quarry Pond at Zeunert Park and to Wilshire Pond. The storm sewers transported contaminated sediment from the former manufacturing areas to the Quarry and Wilshire Ponds. The storm sewer inlets on the manufacturing

areas have been closed so that contamination cannot continue to enter the sewers. However, the storm sewers currently contain contaminated sediments that will continue to spread to Quarry and Wilshire Ponds if they are not remediated.

Pollutants from the manufacturing areas of Amcast North have been found in residential yards adjacent to Amcast North. This is believed to be attributed to overland flow during rain events. A former disposal area on Amcast South also received contaminated materials (PCBs, volatile organic compounds [VOCs], and polycyclic aromatic hydrocarbons [PAHs]) that have affected surrounding subsurface soil and groundwater. Table 1 shows the summary of maximum concentrations of the contaminants detected in the soils and sediments at each area of the Site. Table 2 shows the summary of maximum concentrations of the contaminants detected in groundwater at the Site.

The nature and extent of contamination at Amcast North is described in more detail in the RI Report and is summarized below:

- The highest PCB concentrations are generally limited to the top 5 feet of soil on the grounds surrounding the location of the former building.
- PCB concentrations in soil beneath the former building foundation slab are generally lower than those present in surficial soils.
- Wipe samples collected by Amcast in 2007 from the concrete foundation of the former building, during a Phase II site assessment for the bankruptcy sale of the Amcast North property, are generally below the Toxic Substances Control Act (TSCA) unrestricted use level of 10 micrograms (µg) per 100 square centimeters (cm^2), with some locations exhibiting higher concentrations up to 940 µg/100 cm^2.
- Arsenic concentrations in surface and subsurface soil range from 0.61 to 5.3 milligrams per kilogram (mg/kg), which is lower than natural background concentrations according to the United States Geological Survey (USGS) and WDNR.[1]
- The highest concentrations of total PAHs are generally limited to the top 6 feet of soil.
- None of the individual VOC compounds were detected above their respective EPA Regional Screening Levels (RSLs) in surface or subsurface soil.

As indicated in the CSM, some PCB-laden soils were transported overland from the Amcast North Site to nearby residential yards from stormwater flow.

[1] Although the arsenic concentrations in site soils exceed regional screening levels (RSLs), the detected concentrations fall within the range of baseline values (less than 1.1 mg/kg to 8.0 mg/kg) established by the USGS for glacially deposited soil within the Lake Michigan Lobe (Stensvold 2012). WDNR has also concluded that the USGS data set is of sufficient scope and quality to establish a statewide soil background threshold value for arsenic that can be categorically accepted as "not exceeding background." The WDNR background threshold value for arsenic is 8 parts per million (ppm); equivalent to 8 mg/kg (WDNR 2013).

Contaminants were also transported by the Cedarburg storm sewer system to Wilshire Pond, which is part of the City of Cedarburg's stormwater management system, designed to settle soils and sediments before stormwater is discharged to Cedar Creek. Sediments in Wilshire Pond were sampled during the RI, and the following is a summary of the contamination that was found:

- Total PCB concentrations ranged from 1.3 mg/kg to 520 mg/kg in the 17 sediment samples collected.
- PCBs were not detected in surface water samples.
- Only aluminum (2 samples) and manganese (1 sample) exceeded WDNR Enforcement Standards (ES) for surface water of 200 and 300 micrograms per liter (µg/L), respectively.
- Total PCB concentrations in fish and tadpole tissues ranged from 3.83 to 30 mg/kg.

The nature and extent of contamination at Amcast South is described in more detail in the RI Report and is summarized below:

- The highest concentrations of PCBs in soil at Amcast South generally occur within the limits of the former disposal area. Concentrations increase with depth, with maximum concentrations between 11 and 21 feet.
- The distribution of PAHs in surface soil (between 0 and 2 feet below ground surface [bgs]) and subsurface soil (deeper than 2 feet bgs) roughly correlates with PCB distribution, except that the highest PAH concentrations are found in surface soils.
- VOCs were not detected in soil samples.
- Arsenic concentrations in surface and subsurface soil (1.2 mg/kg to 8.2 mg/kg) are not related to site contaminants and are likely naturally occuring according to USGS and WDNR (see footnote on previous page).
- Lead concentrations in soil at one location (FVSS-06: 1200 mg/kg from 1 to 3 feet, 430 mg/kg from 5 to 7 feet) exceeded the residential RSL of 400 mg/kg; FVSS-06 is located outside of the former disposal area boundary, on the eastern boundary of Amcast South and west of the railroad tracks.

As indicated in the CSM, contaminants traveled from Amcast South and Amcast North to the Quarry Pond in Zeunert Park and Wilshire Pond via the storm sewer system. A brief description of the contamination found in the Quarry Pond and Wilshire Pond is presented below:

- Total PCB concentrations in Quarry Pond range from 1.3 mg/kg to 11,000 mg/kg in 31 sediment samples, with the highest concentrations located in the portion of the pond where the storm sewer discharges stormwater that originates at Amcast South.
- PCB contamination on the banks of Quarry Pond and in Zeunert Park soil is coincident with park areas that are more prone to flooding (areas of relatively low ground surface elevations), suggesting that pond sediment is the likely source of the on-land PCB contamination, and that sediment was deposited during events of high water in the Quarry Pond.

- The highest total PCB concentration in surface soil was detected in the northern portion of the park (2.0 mg/kg) and is thought to be due to sediment deposition from the pond.
- PCBs were not detected in Quarry Pond surface water samples.
- Pentachlorophenol (PCP), an organochlorine compound used as a pesticide and a disinfectant, was detected in 5 of 8 surface water samples at concentrations above the WDNR ES of 1 µg/L. However, based on the limited detections of PCP in Site soil and groundwater, the concentrations of PCP detected in Quarry Pond surface water do not appear to be related to the former Amcast operations.
- PCBs were detected in tissues of 13 of 24 aquatic organisms (including fish, frogs, and tadpoles) collected in Quarry Pond, ranging in concentration from 2.5 to 25 mg/kg.
- Total PCB contamination in Wilshire Pond range from 1.3 mg/kg to 520 mg/kg in 17 sediment samples, with the highest concentrations occurring nearest to the stormwater sewer outfall (Basin A). There was no discernable trend in vertical distribution of PCBs; pond sediments are likely disturbed frequently during larger stormwater flows.
- PCBs were detected in tissues of two fish and six tadpoles collected in Wilshire Pond, ranging from 3.83 to 30 mg/kg.

The storm sewers that conveyed contaminants from Amcast North and Amcast South to the other sub-areas described above have the potential to act as source areas that could re-contaminate downgradient areas in the future. A summary of the results of the RI pertaining to the storm sewers is presented below:

- Total PCB sample concentrations in storm sewer sediment collected upslope from Wilshire Pond range in concentration from 0.65 mg/kg to 19 mg/kg, with the highest concentration detected immediately adjacent to the Amcast North building.
- Storm sewer sediment samples collected from sewers that connect Amcast South and Quarry Pond have total PCB concentrations ranging from 1.35 mg/kg to 23,000 mg/kg. The highest concentrations were detected from sewer sediment samples on-Site in Amcast South, with concentrations decreasing in the downslope directions within the sewers.
- Storm sewers located in Zeunert Park have total PCB sediment sample concentrations ranging from 2.0 mg/kg to 250 mg/kg.

Groundwater near the Site source areas was sampled during the RI. A summary of the groundwater results is presented below:

- Monitoring well AMS-MW01, immediately east of the former disposal area on Amcast South, was the only Site well where PCBs (Aroclor 1260) were detected at 1.5 µg/L, above the WDNR ES of 0.03 µg/L during the most recent (2011) monitoring event.
- PCBs were detected in another well during the 2003/2004 sampling events on Amcast North (FVMW-27) and 3 additional Amcast South wells (FVMW-21, GMMW-3, and

GMMW-7), all of which are shallow wells screened in the upper clay/silt, and all of which had no PCB detections in 2011.

- Bromodichloromethane at well GMMW-1 (1.1 µg/L) was the only VOC detected above its EPA Maximum Contaminant Level (MCL)/WDNR ES (0.6 µg/L) in 2011. GMMW-1 is located at the farthest northern corner of Amcast South, upgradient of former operations at Amcast South and cross-gradient of former operations at Amcast North. Bromodichloromethane is not thought to be related to former Amcast operations and no surrounding facilities have been identified that are a likely source.
- There were no semi-volatile organic compounds (SVOCs), including PAHs, detected above their individual MCL/ES in 2011 groundwater data.
- Arsenic and manganese were the only metals exceeding an MCL/ES (10 µg/L and 300 µg/L, respectively) in the 2011 data. The exceedances occurred at the following locations and concentrations:

  Amcast South: AMS-MW01 manganese: 1,120 µg/L; GMMW-3 arsenic: 16.6 µg/L; GMMW-4 arsenic: 13.3 µg/L, manganese 485 µg/L;
  Zeunert Park: FVMW-23 manganese: 722 µg/L; FVMW-24 manganese: 754 µg/L.

  The arsenic concentrations in groundwater are likely a result of the naturally elevated (background) concentrations in soil established by the USGS for glacially deposited soil within the Lake Michigan Lobe (Stensvold 2012) and the WDNR soil background threshold value for arsenic (WDNR 2013).
- Lead was not detected in the 2011 data, but was detected in several wells exceeding the MCL/ES (15 µg/L for both) in 2003 and 2004 monitoring events.

F. Current and Potential Future Site and Resource Use

Land use for the Amcast North and South properties and surrounding area consists of multiple zoning districts. The Amcast North property is zoned residential and is bounded on the northeast, southeast, and northwest by existing residences. A Canadian National Railroad line runs along the east side of Amcast South and along the west side of Amcast North and Zeunert Park/Quarry Pond. Farther east is an "I-1" zone (Institutional and Public Service District) that includes the Wilshire Pond and a municipal water treatment plant, and east of that parcel is Cedar Creek. Along the Creek's western boundary, between the Amcast Site and Cedar Creek, zoning is I1, B2 (Community Business), or C1 (Conservancy District).

The Amcast South property is located in a "mixed-use infill district" that is "intended to provide for a mixture of limited business and higher-density residential uses that are located adjacent to or within a primary residential area in a manner that is consistent with the City of Cedarburg Comprehensive Plan" (City of Cedarburg 2012). The Amcast South property is bounded on the west by existing residences, on the south by the City of Cedarburg's Department of Public Works offices and garages (I-1), and on the east by the railroad and a small manufacturer zoned as a "M-1" (Limited Manufacturing District). East of Amcast

South across the railroad tracks is Zeunert Park and Quarry Pond, which are zoned as a park and recreation district (P-1). The P-1 area is surrounded by both residential-zoned and industrial-zoned parcels.

The Amcast North and South properties were purchased by a developer in late 2018. Demolition of Amcast North manufacturing buildings and the Amcast South Quonset hut were completed in December of 2020. The developer plans to redevelop the Site for residential and commercial use.

The land use in Zeunert Park around Quarry Pond consists of park parcels on the north (baseball diamond), northeast, and southwest sides; private residences around the southeast; and a fenced private property around the northwest side. The southwest portion of the park includes a ballpark and play structures, and the northeast part of the park is green space. The park is located within city limits in a residential neighborhood. Quarry Pond basin is located within Zeunert Park with no restrictions to access. Currently, signs are posted around Quarry Pond advising the community not to fish, swim, or wade in the pond.

There is no known current use of groundwater near the Site for drinking water; drinking water is supplied by the City of Cedarburg from wells located elsewhere within the city.

G. Summary of Site Risks

1. Summary of Human Health Risk Assessment

The baseline human health risk assessment (HHRA) estimates what risks the site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for this site. To estimate the baseline risk at a Superfund site, EPA undertakes a four-step process:

Step 1: Identification of Chemicals of Potential Concern
Step 2: Exposure Assessment
Step 3: Toxicity Assessment
Step 4: Risk Characterization

In Step 1 (Identification of Chemicals of Potential Concern), EPA looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help EPA determine which contaminants are most likely to pose the greatest threat to human health and define chemicals of potential concern (COPCs).

In Step 2 (Exposure Assessment), EPA considers the different ways that people might be exposed to the COPCs identified in Step 1, the concentrations that people might be

exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a "reasonable maximum exposure" scenario which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3 (Toxicity Assessment), EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. EPA considers two types of risk: cancer risk and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability – for example, a "1 in 10,000 chance" – and is described in terms of an excess lifetime cancer risk (ELCR). In other words, for every 10,000 people that could be exposed, one extra cancer case may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected from all other causes. For noncancer health effects, EPA calculates a "hazard index" (HI). The key concept here is that a "threshold level" (measured usually as an HI of less than 1) exists below which non-cancer health effects are not predicted.

In Step 4 (Risk Characterization), EPA determines whether site risks are great enough to cause health problems for people at or near the Superfund site. The results of the three previous steps are then combined, evaluated, and summarized, and COPCs are identified as COCs needing to be addressed in the remedy.

EPA conducted a HHRA as part of the RI, issuing a report in 2015 which is included in the AR. The process and conclusions from the HHRA are summarized below.

a) <u>Identification of Chemicals of Potential Concern</u>

To identify COPCs for the Site, EPA evaluated data collected from numerous investigations ranging from 1992 to 2011, both inside and outside of the scope of EPA's RI. Prior to Amcast declaring bankruptcy in 2005, several investigations were conducted by Amcast's contractors (see the AR Index [Attachment 3] for a list of relevant documents). Data was collected in several environmental media including soil (surface and subsurface), groundwater, surface water, sediment, and fish tissue.

Sample results were compared to EPA RSLs for residential, industrial worker, and recreational use scenarios, adjusted for a HI of 0.1 and an ELCR of 1×10^{-6}, under current and future land-use scenarios. COPCs were screened based on exceeding RSLs for each sub-area of the Site (Amcast North, Amcast South, Quarry Pond/Zeunert Park, Wilshire Pond, and Sitewide groundwater), with the exception of the residential yards and sewers. The residential yards adjacent to Amcast North were not evaluated in detail in the HHRA, as PCBs were the only COPC identified, and it was determined that any residential property with PCB contamination above the residential screening level presented an unacceptable risk requiring remediation.

Sewers were not evaluated as they were determined not to pose a direct contact risk for any of the exposure scenarios evaluated.

Soil samples were further sub-divided by depth as surface soil (0-2 feet) and total soil (0-10 feet). Samples were evaluated for current residential, recreational, and trespassing exposure scenarios, as well as future residential use and industrial or construction worker exposures. Fish tissue samples were further sub-divided to bottom feeders and suspended feeders. Groundwater samples were screened both for future drinking water use and exposure to vapors volatilizing to groundwater for future residential land-use scenarios. Shallow impacted groundwater is not currently used in the area for drinking water and is supplied by the City of Cedarburg from wells located elsewhere in the city.

Tables 3.1 through 3.16 list COPCs for the Site by area and exposure pathway that were evaluated in the HHRA, including maximum and minimum concentrations and locations of maximum concentrations. COPCs were screened by comparing to RSLs; chemicals which were not present above their respective RSLs were not carried through for further risk assessment.

b) Exposure Assessment

EPA identified several complete exposure pathways against which to screen COPCs for each of the eight sub-areas of the Site.

Table 4 includes a list of complete exposure pathways at the Site divided by each sub-area. In general soil and sediment exposure pathways evaluated included ingestion or inhalation of particles or dermal contact with Site soils/sediments by trespassers, future residential occupants, and future industrial/construction workers. Fish tissue samples were evaluated for consumption by adults and children. Groundwater was evaluated for future ingestion of and dermal contact with Site groundwater, as well as inhalation of sub-surface vapors volatilizing from groundwater into a future residential development or through use of contaminated groundwater in plumbing.

c) Toxicity Assessment

For each COPC identified, and each complete exposure pathway in which COPCs are present, HIs and ELCRs can be calculated. Tables 5.1 and 5.2 summarize carcinogenic (cancer-causing) toxicity information used for each COPC, and Tables 6.1 and 6.2 summarize non-carcinogenic toxicity data used for each COPC.

d) Risk Characterization

The HIs and ELCRs calculated from the toxicity data in Tables 5.1-2 and 6.1-2 are used to calculate the total risks caused to people via the identified complete exposure

pathways and identify COCs. Tables 7.1 through 7.16 list a summary of total risk for each pathway for COCs with unacceptable risks.

For carcinogens, risks are generally expressed as the incremental probability of an individual's developing cancer over a lifetime as a result of exposure to the carcinogen. ELCR is calculated from the following equation:

$$ELCR = CDI \times SF$$

where: ELCR = a unitless probability (e.g., 2×10^{-6}) of an individual's developing cancer
CDI = chronic daily intake averaged over 70 years (mg/kg-day)
SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$

These risks are probabilities that usually are expressed in scientific notation (e.g., $1x10^{-6}$). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of Site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an individual's developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 10^{-4} to 10^{-6}.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ< 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The HI is generated by adding the HQs for all COCs that affect the same target organ (*e.g.*, liver) or that act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI< 1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI> 1 indicates that site-related exposures may present a risk to human health.

The HQ is calculated as follows:

$$HQ = CDI/RfD$$

where: CDI = Chronic daily intake
RfD = reference dose

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

Based on the results of this evaluation, the COCs identified with unacceptable risk for soil, sediment, and fish tissues are listed in the below table.

Amcast North Soils	Residential Yards Soils	Amcast South Soils	Pond Sediments and Bank Soils	Quarry Pond Fish Tissue
PCBs	PCBs	PCBs	PCBs	PCBs
Benzo(a)anthracene		Benzo(a)anthracene		
Benzo(a)pyrene		Benzo(a)pyrene		
Benzo(b)fluoranthene		Benzo(b)fluoranthene		
Benzo(k)fluoranthene		Benzo(k)fluoranthene		
Dibenzo(a,h)anthracene		Chrysene		
		Dibenzo(a,h)anthracene		
		Indeno(1,2,3-cd)pyrene		

It should be noted that benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene are chemicals that are part of the PAH group, and are referred to elsewhere in this ROD as PAHs collectively. It should also be noted that arsenic was identified as having an excess cancer risk above acceptable limits, but due to its nature as a background constituent in Wisconsin soils, it was not identified as a COC for the Site (see Section E.6 for more information).

The HHRA also identified several COCs in groundwater, summarized in the below table. These COCs will be monitored for in the interim remedy described in this ROD, and will be re-evaluated as potential COCs in a future ROD for OU2 (groundwater).

VOCs/SVOCs	PAHs	Metals	Other
1,1'-Biphenyl	Benzo(a)anthracene	Arsenic	PCBs
1,2,4-Trimethylbenzene	Benzo(a)pyrene	Chromium	

Benzene	Benzo(b)fluoranthene	Iron	
bis(2-ethylhexyl)phthalate	Benzo(k)fluoranthene	Manganese	
Bromodichloromethane	Chrysene		
Chloroform	Dibenzo(a,h)anthracene		
Ethylbenzene	Indeno(1,2,3-cd)pyrene		
Hexachloroethane			
Naphthalene			
Pentachlorophenol			

Table 8 includes a summary of all COCs identified in the HHRA, and the exposure pathways for which the COCs pose an unacceptable risk.

e) <u>Uncertainty Analysis</u>

The assumptions used in the HHRA have inherent uncertainty. While it is theoretically possible that this could lead to underestimates of potential risk, the use of numerous upper-bound assumptions most likely results in conservative estimates of potential risk. A receptor group's potential exposure and subsequent potential risk are influenced by the exposure scenario and dose/response; the exposure and risk vary on a case-by-case basis. The key assumptions in the HHRA and their influence on the numerical risk estimates are discussed below.

PCB analysis: PCB samples collected in various phases of the investigations were analyzed as either "total PCBs" or Aroclor mixtures. Where Aroclors were collected, the sum of each Aroclor mixture analyzed was used to report total PCBs. However, Aroclors are themselves a mixture of various PCB congeners, and it is likely that using the sum of each Aroclor analyzed would essentially 'double-count' PCB congeners, resulting in an overestimate of risk for that sample.

Upper Confidence Limits: The exposure point concentrations used in the HHRA were the 95 percent upper confidence limit (UCL) on the mean concentrations. The use of 95 percent UCLs on the mean concentrations likely leads to an overestimation of actual exposure because receptors are assumed to be exposed to the 95 percent UCL for the entire exposure duration. The assumption that all potential exposures are to the 95 percent UCL likely results in an overestimation of actual exposures and estimates of potential risk.

Industrial Exposure Duration: Potential future industrial workers are assumed to be exposed to site-related COCs for 250 days per year for an exposure duration of 25 years. Given the expected future residential use of the Site, actual exposures are likely to be less than the frequency and duration of exposures assumed in this HHRA for a hypothetical future industrial worker.

Groundwater Use Scenarios: Groundwater exposures were quantified for hypothetical future residential use. Although potable use of groundwater was quantified, the Site is currently served by the public water supply, and it is expected that the Site will continue to be served in the future. It is unlikely that groundwater at the Site would be used as drinking water in the future.

2. Summary of the Ecological Risk Assessment

The objective of the ecological risk assessment (ERA) was to evaluate whether Site-related contaminants, present on the Site and in surrounding areas connected to the Site through complete transport pathways, represent a potential unacceptable risk to exposed ecological receptors. The ERA was performed as part of the RI and in accordance with the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA 1997).

Conservative assumptions were generally used in the exposure and effects assessments, so uncertainties related to the limitations of the available data (requiring that certain assumptions and extrapolations be made), along with uptake and food web exposure model assumptions, are more likely to result in an overestimation rather than an underestimation of the likelihood and magnitude of risks to ecological receptors. Potential COCs were identified for each of the terrestrial and aquatic areas evaluated in the ERA (Amcast North, Amcast South, Residential Area, Zeunert Park, Quarry Pond, and Wilshire Pond). PCBs are the ERA COCs identified in aquatic habitats associated with the Site (Quarry Pond basin sediment, fish tissue, and aquatic food webs; Wilshire Pond basin and bank sediment, fish tissue, and aquatic food webs). The fish tissue and aquatic food web exposures in Wilshire Pond constitute the highest potential ecological risks of those evaluated in the ERA. PCBs are also the primary ERA COCs in terrestrial habitats on and adjacent to the Site. Table 9 summarizes ecological receptors and exposure pathways that were evaluated in the ERA. Table 10 lists the COCs identified in the ERA for each location and complete exposure pathway.

The COCs identified posing an unacceptable ecological risk are copper, manganese, PAHs, and PCBs (specified in the ERA tables as either Aroclor 1248, Aroclor 1254, or Total PCBs). COCs were identified for all terrestrial and aquatic areas evaluated in the ERA, as summarized below.

a) Amcast North

Manganese and PCBs were identified as potential surface soil COCs for direct exposures of lower trophic level receptors. The results of the terrestrial food web evaluation identified PCBs as potential COCs. These potential risks were driven largely by short-tailed shrew exposures. Given the relatively poor habitat quality present in this area, the identified potential risks were likely of low ecological significance.

b) Residential Yards

PCBs were identified as COCs in surface soil for direct exposures of lower trophic level receptors. However, potential risks to these receptors were relatively low. Based on a soil ecological screening value (ESV) for terrestrial plants of 8 mg/kg (including an uncertainty factor of 5), the maximum HQ in this area was 1.6. Given the relatively low habitat quality present in this area, it is likely that exposures and potential risks are low. The results of the terrestrial food web evaluation identified PCBs as COCs. Potential risks were driven largely by short-tailed shrew exposures.

c) Amcast South

Copper, manganese, PCBs, and high molecular-weight PAHs were identified as potential surface soil COCs for direct exposures of lower trophic level receptors. Copper exceeded soil ESVs in just one site surface soil sample but at a relatively high ratio (14.4), suggesting that there are relatively high, but spatially isolated, areas of copper contamination in this area of the Site. Similarly, high molecular weight PAHs exceed ESVs in just 2 of 15 surface soil samples (but at maximum ratios exceeding 5), although mean HQs are less than one. Thus, PAH contamination at ecologically relevant levels is likely to be spatially limited. The results of the terrestrial food web evaluation identified PCBs as COCs. Potential risks were driven largely by short-tailed shrew exposures. However, mean HQs for this receptor were exceeded only for the maximum acceptable toxicant concentration (HQs = 1.50) and for the lowest observed adverse effect level. Thus, potential risks were marginal for these two chemicals.

d) Zeunert Park

No chemicals were identified as surface soil COCs for direct exposures of lower trophic level receptors, and risks were considered acceptable for this pathway. The results of the terrestrial food web evaluation identified PCBs as COCs. Potential risks were driven by short-tailed shrew exposures. However, mean HQs for this receptor did not exceed 1.0. Thus, potential risks were marginal for these COCs.

e) Quarry Pond

There were no COCs identified for Quarry Pond surface water. PCBs were identified as COCs in pond basin surface sediment. However, bank surface sediment samples did not exceed acceptable risk levels. Thus, potential risks related to bank soils were relatively low and are not likely to be ecologically significant. No COCs were identified for bank surface sediments.

The concentrations of PCBs in pond basin surface sediment samples exceed risk levels, and the elevated concentrations extended into the subsurface sediments where most samples also exceed the site-specific ESV of 1.9 mg/kg. Thus, risks related to pond surface sediments for PCBs (the COCs for this media) were relatively high and are likely to be ecologically significant.

PCBs were identified as potential COCs in Quarry Pond fish tissue. However, HQs based on mean concentrations did not exceed 1.0 so potential risks on a population level were marginal. The limited food supply in the pond (based on the limited littoral zone and minimal benthic invertebrate community) and the seasonally low bottom dissolved oxygen concentrations in the deeper portions of the pond may have been more limiting factors for fish populations than PCB contamination.

Similarly, PCBs were identified as potential COCs for food web exposures in Quarry Pond. However, only the tree swallow has a lowest observed adverse effect level-based mean HQ exceeding 1.0. Based on the qualitative benthic invertebrate sampling, there appears to be a limited food base for this receptor, which eats emergent flying insects. Thus, risks from food web exposures in Quarry Pond were marginal. Potential risks for species utilizing the pond banks (such as Canada geese) did not exceed acceptable risk thresholds. Thus, fish and aquatic food web pathway risks from PCB exposures were marginal and may not be ecologically significant given the relatively poor habitat conditions that currently exist.

f) Wilshire Pond

While there is some uncertainty due to the lack of dissolved metals data and the potential turbidity of some samples, potential risks from surface water exposures were relatively low and no COCs were identified for this media.

PCBs were identified as COCs in surface sediment. The concentrations of these chemicals in combined pond and bank samples exceeded risk values. The elevated concentrations extended into the subsurface sediments of the basins where the majority of samples also exceeded risk-based values. Thus, potential risks related to pond and bank surface sediment samples were relatively high and likely to be ecologically significant.

PCBs were identified as COCs in fish tissue and for food web exposures. Exceedances were of high enough magnitude to warrant the retention of these chemicals for these pathways, which constitute the highest potential ecological risks of those evaluated.

3. Basis for Taking Action

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants, or contaminants into the environment.

H. Remedial Action Objectives

Remedial action objectives (RAOs) are goals specific to media or OUs for protecting human health and the environment. They are based on unacceptable risks, anticipated current and future land use, objectives and expectations of the action, and statutory requirements. RAOs were developed for the Site based on the COC levels and exposure pathways estimated to pose an unacceptable risk to human health and the environment, as determined during the RI.

1. Human Health and Ecological Risk based RAOs

Unacceptable risks or hazards were identified in surface soil (0 to 2 feet), total soil (0 to 10 feet), groundwater, sediment, and fish. No RAOs are proposed for Zeunert Park soils as they currently pose no unacceptable human health or ecological risks. The corresponding RAOs have been developed to address these risks under this proposed action:

- Soil
    - Reduce or eliminate human exposure through dermal contact, ingestion, and inhalation of COCs in soil to levels protective of current and reasonably anticipated future (residential) land uses at the Site.
- Groundwater (Interim RAOs)
    - Prevent human exposure via dermal contact with, and ingestion of, contaminated groundwater at the Site.
    - Reduce or eliminate human exposure from vapor intrusion (VI) of COCs found in the groundwater for hypothetical future residents and/or future industrial workers at the Site.
- Quarry Pond and Wilshire Pond Sediment
    - Reduce or eliminate human exposure through dermal contact with and ingestion of COCs for recreational users.
- Quarry Pond Fish
    - Reduce fish tissue COC concentrations to acceptable levels for human consumption.

The ecological RAOs for surface soil (0 to 2 feet), surface sediment, fish/frog tissue, and wildlife are as follows:

- Surface soil
    - Reduce or eliminate direct contact, direct ingestion, and/or food web exposures to COC concentrations that are above acceptable levels at the Site.
- Pond Basin and Bank Sediment
    - Reduce or eliminate direct contact, direct ingestion, and/or food web exposures to COC concentrations that are above acceptable levels at the Site.
- Wildlife
    - Reduce the potential for bioaccumulation of PCBs into fish/frog tissues above acceptable levels at the Site.
    - Minimize the potential for adverse effects resulting from the ingestion of water and aquatic prey taken from surface waters containing PCBs.

2. Cleanup Levels

To meet the RAOs, preliminary remediation goals (PRGs) were developed in the Proposed Plan to define the extent of contaminated media (soil, sediment, and groundwater) requiring remedial action. PRGs are risk-based or Applicable or Relevant and Appropriate Requirement (ARAR)-based chemical-specific concentration levels. These PRGs were used to develop cleanup levels used in this ROD.

EPA developed the cleanup levels for the Site based both on protective risk-based concentrations associated with current and reasonably anticipated future land uses and a review of federal and state ARARs. The ARARs identified for this ROD are provided in Table 11.

It is expected that once achieved, the cleanup levels in this ROD will be protective of human health and the environment. The remedial action will address hazards associated with exposure to contaminated soils, concrete, sediments, and fish.

Potential exposures to sediment and water in the stormwater sewers would be very infrequent and are considered negligible, and as such were not evaluated in the HHRA. However, cleanup levels are proposed for storm sewer sediments because of the potential for PCB contamination associated with sewer sediment or backfill to continue to act as source material for water traveling toward Wilshire and/or Quarry Ponds, either within the pipes or along the backfill. These cleanup levels are also consistent with PCB cleanup limits under TSCA.

A surface-weighted average concentration (SWAC) is used as a cleanup goal for sediments in Quarry Pond. A SWAC is a method of spatially calculating the mean (average) concentration of a constituent in the sediment surface. Samples are collected throughout the area of concern, representative sub-areas are generated for each sample location, and a sub-area-weighted average concentration is calculated to produce the SWAC for the entire surface, instead of comparing individual samples to applicable criteria as done for soil samples at the Amcast Site. SWACs account for the natural

variability of impacts in sediment and provide an estimated average exposure to organisms who live within Quarry Pond.

Cleanup levels are summarized in the following table; cleanup levels for groundwater are not established in this ROD and will be established in the future in a separate ROD for OU2.

Cleanup Levels for OU1

Media/Biota	PCB Cleanup Level	PAH and Metal Cleanup Levels
Fish Tissue	0.025 mg/kg (achieved via a long-term SWAC of 0.25 mg/kg in sediment)	N/A
Sediment (Quarry Pond)	Long-term SWAC of 0.25 mg/kg	N/A
Sediment (Wilshire Pond, Storm Sewers)	1 mg/kg	N/A
Non-Residential Soils (pond banks)	1 mg/kg	N/A
Residential Soils (including Amcast North and South)	0.22 mg/kg	Benzo(a)anthracene: 0.15 mg/kg Benzo(a)pyrene: 0.015 mg/kg Benzo(b)fluoranthene: 0.15 mg/kg Benzo(k)fluoranthene: 0.15 mg/kg Chrysene: 0.52 mg/kg Dibenzo(a,h)anthracene: 0.015 mg/kg Indeno (1,2,3-cd)pyrene: 0.15 mg/kg High Molecular Weight PAHs: 18 mg/kg Copper: 80 mg/kg Lead: 400 mg/kg Manganese: 450 mg/kg
Concrete (Amcast North)	0.22 mg/kg	N/A

I. Description of Alternatives

EPA developed and evaluated several different remedial alternatives for the Site, which are presented below. For each of the eight sub-areas a "no action" alternative was evaluated. The NCP requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. This alternative was rejected in each case because it would not achieve

the RAOs for the Site. After the FS was completed, EPA further evaluated several of the soil and sediment alternatives to be consistent with 1 x 10^{-6} risk levels in a Technical Memorandum dated March 13, 2023. EPA also updated the estimated costs for all the remedial alternatives in the Technical Memorandum, which is included in the AR. All of the proposed remedial alternatives and their associated cost estimates are presented below. Estimated costs include both capital (i.e., costs to construct a remedial alternative) and operation and maintenance costs (i.e., post-construction costs), where applicable. Alternatives are numbered to correspond with the numbers in the March 13, 2023, Technical Memorandum and are further explained in the FS report, Technical Memorandum, and Proposed Plan.

1. ***Amcast North (Figure 4)***

   a) <u>AMN-1: No Action</u>

   Estimated Capital cost: $0
   Estimated Annual Operation and Maintenance (O&M) cost: $0
   Estimated Construction Timeframe: N/A
   Estimated Time to Achieve RAOs: N/A
   Estimated Total Present Worth cost: $0

   Alternative AMN-1 consists of taking no action. The no-action alternative would leave affected soil in place at the Site. There are no capital or O&M costs associated with Alternative AMN-1. However, Superfund regulations require five-year site reviews as long as hazardous substances remain at the site at concentrations that do not allow unlimited use and unrestricted exposure (UU/UE).

   b) <u>AMN-2: Concrete Sampling and Pressure Washing/Removal, Excavation, Offsite Disposal, Backfill and Site Restoration (EPA's Selected Alternative)</u>

   Estimated Capital cost: $3,080,493
   Estimated Annual O&M cost: $0
   Estimated Construction Timeframe: 4 months
   Estimated Time to Achieve RAOs: 4 months
   Estimated Total Present Worth cost: $3,080,493

   Alternative AMN-2 consists of excavating the soil with COCs exceeding cleanup levels, followed by offsite disposal at a Resource Conservation and Recovery Act (RCRA) Subtitle D landfill for soils containing less than 50 mg/kg PCBs or TSCA-permitted and Offsite Rule (OSR)-approved facility for soils containing greater than 50 mg/kg PCBs. Sampling will be conducted during the design phase to better define the extent of soils requiring disposal at a TSCA facility, and to assess what portions of the extant concrete slab foundation need to be either removed or power-washed to reduce PCB concentrations. Soil verification samples would be required to document

that soil with concentrations exceeding cleanup levels has been removed. The excavation would then be filled with clean soil and restored to existing conditions. The alternative was originally developed with the assumption that the Amcast North building would remain intact. The building was demolished by the current owner (Oliver Fiontar LLC) in 2020, and so any design developed for remediation based on this alternative will be modified based on current Site conditions.

This alternative was modified from the preferred alternative presented in the Proposed Plan based on comments received from the public during the public comment period and is discussed in further detail in the Documentation of Significant Changes section (Section 2.N below). Approximately 4,981 cubic yards (yd^3) of non-TSCA and 56 yd^3 of TSCA soil would be removed (to be confirmed with sampling during design). There are no O&M costs associated with Alternative AMN-2 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $3,080,493, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 4 months.

c) AMN-3: Excavation, Backfill, Isolation Cover, and Site Restoration

Estimated Capital cost: $1,442,786
Estimated Annual O&M cost: $773,323
Estimated Construction Timeframe: 3 months
Estimated Time to Achieve RAOs: 3 months
Estimated Total Present Worth cost: $2,216,109

AMN-3 consists of excavating PCB soils greater than 10 mg/kg (the TSCA high-occupancy limit for capped PCB-impacted soil) and constructing an isolation cover over the soil with COCs exceeding cleanup levels. The Amcast North building was demolished by a third party outside of EPA's control and so any design developed for remediation based on this alternative will be modified based on current Site conditions. Excavated soils would be disposed of at a RCRA or TSCA-permitted and OSR-approved facility. Sampling will be conducted during the design phase to better define to the extent of soils requiring disposal at a TSCA facility. Soil verification samples would be taken to document that soil with concentrations exceeding cleanup levels has been removed.

The unique components of AMN-3 are as follows:

- Excavating contaminated soils with PCB concentrations greater than 10 mg/kg to a depth of 3 feet below grade, as depicted in Figure 14;
- Constructing a low-permeability isolation cover over the soil remaining with COCs exceeding cleanup levels; and

- Removing approximately 56 yd^3 of TSCA soil.

Annual inspections and maintenance of the isolation cover would be required into perpetuity after construction is complete; a cost estimate for 30 years of maintenance was generated. Institutional controls (ICs) in the form of deed restrictions to define areas of remaining contamination and associated restrictions would be required for this alternative. The total estimated present worth cost to implement this alternative is $1,442,786, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 3 months.

2. Residential Yards (Figure 4)

a) RY-1: No Action

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative RY-1 consists of taking no action. The no-action alternative leaves affected soil in place at the Site. There are no capital or O&M costs associated with Alternative RY-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) RY-2: Soil Excavation, Offsite Disposal, Backfill, and Site Restoration (PCB Cleanup Level of 1 mg/kg)

Estimated Capital cost: $3,137,495
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 4 months
Estimated Time to Achieve RAOs: 4 months
Estimated Total Present Worth cost: $3,137,495

Alternative RY-2 consists of excavating soil with COC concentrations exceeding cleanup levels, and offsite disposal at RCRA or TSCA-permitted and OSR-approved facility. This alternative was evaluated in the FS as excavating PCB soils greater than 1 mg/kg based on TSCA high-occupancy requirements, prior to the development of the lower 0.22 mg/kg site-specific residential cleanup level for PCBs. Sampling will be conducted during the design phase to better define the extent of soils requiring disposal at a TSCA facility. Soil verification samples will be required to verify that soil with concentrations exceeding cleanup levels has been removed. The excavation will then be filled with clean soil and restored to its existing condition. Approximately 3,015 yd^3 of non-TSCA and 267 yd^3 of TSCA soil will be removed. The total estimated present worth cost to implement this alternative is $3,137,495,

and it is anticipated that implementing this alternative to achieve RAOs will take a total of 4 months.

c) <u>RY-3: Soil Excavation, Offsite Disposal, Backfill, and Site Restoration (PCB Cleanup Level of 0.22 mg/kg) (EPA's Selected Alternative)</u>

Estimated Capital cost: $3,793,290
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 4 months
Estimated Time to Achieve RAOs: 4 months
Estimated Total Present Worth cost: $3,793,290

Alternative RY-3 consists of excavating soil with COC concentrations exceeding cleanup levels, and offsite disposal at RCRA or TSCA-permitted and OSR-approved facility. Sampling will be conducted during the design phase to better define to extent of soils requiring disposal at a TSCA facility. This alternative was evaluated in the March 13, 2023, Technical Memorandum as excavating PCB soils greater than the 0.22 mg/kg site-specific cleanup level for PCBs for a residential use scenario. Soil verification samples will be required to verify that soil with concentrations exceeding cleanup levels has been removed. The excavation would be backfilled with clean soil and restored to its existing condition. Approximately 4,782 yd^3 of non-TSCA and 267 yd^3 of TSCA soil would be removed. There are no O&M costs associated with Alternative RY-3 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $3,793,290, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 4 months.

3. Amcast South (Figure 5)

a) <u>AMS-1: No Action</u>

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative AMS-1 consists of taking no action. The no-action alternative leaves affected soil in place at the Site. There are no capital or O&M costs associated with Alternative AMS-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) AMS-2: Excavation, Offsite Disposal, Backfill, and Site Restoration (Total PCB Cleanup Level of 1 mg/kg)

Estimated Capital cost: $8,822,056
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 4 months
Estimated Time to Achieve RAOs: 4 months
Estimated Total Present Worth cost: $8,822,056

AMS-2 consists of excavating the soil with COCs exceeding cleanup levels, followed by offsite disposal at a RCRA- and/or TSCA-permitted and OSR-approved facility. Sampling will be conducted during the design phase to better define to extent of soils requiring disposal at a TSCA facility. This alternative was evaluated in the FS as excavating PCB soils greater than 1 mg/kg based on TSCA high-occupancy requirements, prior to the development of the lower 0.22 mg/kg site-specific residential cleanup level for PCBs. Verification samples would be required to document that soil concentrations exceeding the TSCA threshold have been removed. The excavation would then be backfilled with clean soil and restored to its existing condition. The alternative is based on the assumption that soils with concentrations exceeding human health and/or the ecological risk levels would be excavated to various depths up to 21 feet below grade. Approximately 11,979 yd^3 of non-TSCA and 1,385 yd^3 of TSCA soil would be removed. The total estimated present worth cost to implement this alternative is $8,822,056, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 4 months.

c) AMS-3: Excavation, Backfill, Isolation Cover and Site Restoration

Estimated Capital cost: $4,460,672
Estimated Annual O&M cost: $1,076,204
Estimated Construction Timeframe: 3 months
Estimated Time to Achieve RAOs: 3 months
Estimated Total Present Worth cost: $5,536,876

AMS-3 consists of excavating PCB soils greater than 10 mg/kg (the TSCA high-occupancy limit for capped PCB-impacted soil) and constructing an isolation cover over the remaining soil with COC concentrations exceeding the site-specific residential use scenario cleanup levels. Excavated soils would be disposed of at a RCRA or TSCA-permitted and OSR-approved facility. Sampling will be conducted during the design phase to better define the extent of soils requiring disposal at a TSCA facility. Soil verification samples would be taken to document that soil with concentrations exceeding risk levels has been removed.

The unique components of AMS-3 are as follows:

- Constructing a low-permeability isolation cover over the soil with COCs exceeding human health and ecological risk levels; and
- Removing approximately 1,385 yd^3 of TSCA soil.

Annual inspections of the isolation cover would be required into perpetuity and a maintenance cost for 30 years after construction is complete was generated. ICs in the form of deed restrictions to define areas of remaining contamination and associated restrictions would be required for this alternative. The total estimated present worth cost to implement this alternative is $5,536,876, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 3 months.

d) <u>AMS-4: Excavation, Offsite Disposal, Backfill, and Site Restoration (Total PCB Cleanup Level of 0.22 mg/kg) (EPA's Selected Alternative)</u>

Estimated Capital cost: $7,933,312
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 4 months
Estimated Time to Achieve RAOs: 4 months
Estimated Total Present Worth cost: $7,933,312

AMS-4 consists of excavating the soil with COCs exceeding cleanup levels followed by offsite disposal at a RCRA- and/or TSCA-permitted and OSR-approved facility. This alternative was evaluated in the March 13, 2023, Technical Memorandum as excavating PCB soils greater than 0.22 mg/kg. Verification samples would be required to document that soil concentrations exceeding cleanup levels have been removed. The excavation would then be filled with clean soil and restored to its existing condition. The alternative is based on the assumption that soils with concentrations exceeding cleanup levels would be excavated to various depths up to 21 feet below grade. Approximately 12,129 yd^3 of non-TSCA and 1,385 yd^3 of TSCA soil would be removed. There are no O&M costs associated with Alternative AMS-4 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $7,933,312, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 4 months.

4. Quarry Pond (Figure 6)

a) <u>QP-1: No Action</u>

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative QP-1 consists of taking no action. The no-action alternative would leave affected sediment in place at the Site. There are no capital or O&M costs associated with Alternative QP-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) <u>QP-2: Sediment Dredging, Bank Soil Excavation, Offsite Disposal, and Site Restoration</u>

Estimated Capital cost: $8,398,937
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 3 months
Estimated Time to Achieve RAOs: 3 months
Estimated Total Present Worth cost: $8,398,937

Alternative QP-2 consists of dredging the sediment and excavating bank soil with COC concentrations exceeding 1.9 mg/kg (the ecological risk level developed in the ERA), followed by offsite disposal of materials at a RCRA- and/or TSCA-permitted and OSR-approved facility. Verification samples would be required to document that sediment concentrations exceeding the ecological risk level have been removed. The pond bank soil would then be backfilled with clean soil and restored.

An estimated 656 yd^3 of bank soil and 14,907 yd^3 of Quarry Pond sediment would be removed under this alternative. The total estimated present worth cost to implement this alternative is $8,398,937, and it is anticipated that implementing this alternative to achieve short-term RAOs will take a total of 3 months. Fish tissue monitoring and sediment sampling would be required until long-term RAOs for fish tissue and sediments are achieved.

c) <u>QP-3: Construct Permeable Reactive Barrier, Excavate Bank Soil, Offsite Disposal, and Site Restoration</u>

Estimated Capital cost: $5,905,381
Estimated Annual O&M cost: $2,366,415
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $8,271,796

QP-3 consists of constructing a permeable reactive barrier (PRB) to isolate sediment with PCB concentrations exceeding cleanup levels, excavating bank soils, and offsite disposal at a TSCA-permitted and OSR-approved facility. Soil verification samples would be required to document that soil with concentrations exceeding cleanup levels has been removed from the bank, and periodic fish tissue verification sampling would be required to monitor long-term reduction of PCB bioaccumulation in fish. The pond

bank areas would then be backfilled with clean soil and restored. An estimated 656 yd^3 of bank soil would be removed under this alternative.

The unique components of QP-3 are as follows:

- Constructing a PRB to isolate the contaminated sediments with concentrations exceeding the 1 mg/kg PCB sediment cleanup level;
- Performing monitoring and maintenance of the PRB and fish tissue sampling every 5 years for a period of 30 years; and
- Implementing ICs (e.g., deed restrictions and signage) to define areas of remaining concern and the associated restrictions that would limit exposure.

The total estimated present worth cost to implement this alternative is $8,271,796, and it is anticipated that implementing this alternative to achieve short-term RAOs will take a total of 2 months. Fish tissue monitoring and sediment sampling would be required until long-term RAOs for fish tissue and sediments are achieved.

d) <u>QP-4: Sediment Dredging to 1 mg/kg PCBs, Bank Soil Excavation, Offsite Disposal, Residual Management Layer and Site Restoration (EPA's Selected Alternative)</u>

Estimated Capital cost: $12,140,519
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 4 months
Estimated Time to Achieve RAOs: 4 months
Estimated Total Present Worth cost: $12,140,519

QP-4 consists of dredging the sediment with PCB concentrations above a 1 mg/kg action level to achieve a post-construction PCB SWAC of 0.5 mg/kg and a long-term PCB SWAC cleanup level of 0.25 mg/kg, and excavating bank soils above the cleanup level for PCBs of 1 mg/kg. The 0.25 mg/kg sediment SWAC cleanup level is intended to hasten the recovery of fish tissues to their respective cleanup level. Dredging will be followed by offsite disposal of materials at a RCRA- and/or TSCA-permitted and OSR-approved facility. Verification samples would be required to document that sediment with concentrations exceeding the post-construction SWAC goal of 0.5 mg/kg has been removed, and periodic fish tissue verification sampling would be required to monitor long-term reduction of PCB bioaccumulation in fish. The pond bank soil would then be backfilled with clean soil and restored after verification sampling. A residual management layer consisting of 3-6 inches of clean sand may also be applied if necessary to reduce post-dredging residual PCB concentrations. An estimated 656 yd^3 of bank soil and 19,573 yd^3 of Quarry Pond sediment would be removed under this alternative. The total estimated present worth cost to implement this alternative is $12,140,519, and it is anticipated that

implementing this alternative to achieve short-term RAOs will take a total of 4 months. Fish tissue monitoring and sediment sampling would be required until long-term RAOs for fish tissue and sediments are achieved.

5. Wilshire Pond (Figure 7)

a) <u>WP-1: No Action</u>

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative WP-1 consists of taking no action. The no-action alternative would leave affected soil in place at the Site. There are no capital or O&M costs associated with Alternative WP-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) <u>WP-2: Sediment and Bank Soil Excavation, Offsite Disposal, Backfill, and Site Restoration (EPA's Selected Alternative)</u>

Estimated Capital cost: $1,861,895
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $1,861,895

Alternative WP-2 consists of excavating the sediment and/or bank soil with PCB concentrations exceeding cleanup levels from each sub-basin composing Wilshire Pond, followed by offsite disposal at a RCRA and/or TSCA-permitted and OSR-approved facility. This alternative assumes that the berms are not contaminated and, therefore, does not include removal and replacement of the berms separating each basin. Verification samples would be required to document that soil with concentrations exceeding cleanup levels has been removed. The slopes of the basins would then be restored to stable conditions. Approximately 1,348 yd^3 of non-TSCA sediment and soil and 89 yd^3 of TSCA sediment would be removed under this alternative. There are no O&M costs associated with Alternative WP-2 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $1,861,895, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

c) <u>WP-3: Sediment and Bank Soil Excavation, Structural Excavation, Offsite Disposal, Backfill, and Site Restoration (EPA's Selected Alternative)</u>

Estimated Capital cost: $2,252,332
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $2,252,332

Alternative WP-3 consists of the same components as Alternative WP-2, except that the berms separating the basins are assumed to be contaminated. Under this alternative, the berms separating the sub-basins would be removed and replaced. The stormwater retention basin would also be restored in consultation with the City of Cedarburg. Approximately 1,859 yd^3 of non-TSCA sediment and soil and 89 yd^3 of TSCA sediment would be removed under this alternative. There are no O&M costs associated with Alternative WP-3 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $2,252,332, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

6. Amcast North Storm Sewers (Figure 8)

a) <u>SSN-1: No Action</u>

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative SSN-1 consists of taking no action. The no-action alternative would leave affected soil and sediment in place at the Site. There are no capital or O&M costs associated with Alternative SSN-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) <u>SSN-2: Abandon Amcast North Building Storm Sewers, Excavation and Backfill, Pressure Wash Non-Building Storm Sewers, Off-Site Disposal, and Site Restoration</u>

Estimated Capital cost: $3,007,513
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $3,007,513

Alternative SSN-2 consists of abandoning the Amcast North building storm sewers at the perimeter and plugging the pipe ends with concrete after pressure washing storm sewers to the extent possible. Soils and sediments with COC concentrations exceeding the 1 mg/kg PCB cleanup level would be excavated in the area outside of the building, excavating the sewer trench fill footprint to access the sewer piping for abandonment. Further, alternative SSN-2 consists of removing sediment and associated water in storm sewers connecting Cedar Creek to Wilshire Pond, and storm sewers from outside of the Amcast North property building footprint and downgradient until the storm sewers discharge into Wilshire Pond, by pressure washing. After pressure washing the pipes, the interior of the pipes would be sealed with epoxy to prevent potential recontamination of the pipes from outside material. All removed soil and sediment would be sent for offsite disposal at a TSCA-permitted and OSR-approved facility. The alternative assumes that the contaminant concentrations in the excavated soil and sewer backfill at the building perimeter would not be RCRA-regulated hazardous waste or exceed the TSCA disposal threshold of 50 mg/kg. Verification samples would be required to determine if soils with concentrations exceeding cleanup levels have been removed. The excavation would then be backfilled with clean soil and restored to its existing condition. There are no O&M costs associated with Alternative SSN-2 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $3,007,513, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

c) <u>SSN-3: Abandon Amcast North Building Storm Sewers, Remove Non-Building Storm Sewer Piping, Excavation and Backfill, Pressure Wash Non-Building Storm Sewers, Off-site Disposal, and Site Restoration (EPA's Selected Alternative)</u>

Estimated Capital cost: $3,122,871
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $3,122,871

Alternative SSN-3 consists of abandoning the Amcast North building storm sewers at the perimeter and removing the estimated 20 feet of non-building storm sewer piping emanating from the Amcast North building after pressure washing storm sewers to the extent possible. Soils and sediments with COC concentrations exceeding the 1 mg/kg PCB cleanup level would be excavated in the area outside of the building after excavating the sewer trench fill footprint to access the sewer piping for abandonment. Further, alternative SSN-3 consists of removing sediment and associated water in storm sewers from outside of the Amcast North property building footprint,

downgradient until the storm sewers discharge into Wilshire Pond, and the sewers connecting Wilshire Pond to Cedar Creek by pressure washing. After pressure washing the pipes, the interior of the pipes would be sealed with epoxy to prevent potential recontamination of the pipes from outside material. All removed soil and sediment would be sent for offsite disposal at a TSCA-permitted and OSR-approved facility. The alternative assumes that the contaminant concentrations in the excavated soil and sewer backfill at the building perimeter would not be RCRA-regulated hazardous waste or exceed the TSCA disposal threshold of 50 mg/kg. Verification samples would be required to determine if soils with concentrations exceeding cleanup levels have been removed. The excavation would then be backfilled with clean soil and restored to its existing condition. There are no O&M costs associated with Alternative SSN-3 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $3,122,871, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

*7. **Amcast South Storm Sewers (Figure 9)***

a) <u>SSS-1: No Action</u>

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative SSS-1 consists of taking no action. The no-action alternative would leave affected soil and sediment in place at the Site. There are no capital or O&M costs associated with Alternative SSS-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) <u>SSS-2: Pressure Wash Storm Sewers, Excavation, Offsite Disposal, Backfill, and Site Restoration</u>

Estimated Capital cost: $2,463,136
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $2,463,136

Alternative SSS-2 consists of pressure washing non-building storm sewers on the Amcast South property and downgradient from the Amcast South Property until the storm sewers discharge into Quarry or Wilshire Pond, removing sediment and

associated water, excavating the soil surrounding impacted sewers with COC concentrations exceeding the 1 mg/kg PCB cleanup level, followed by offsite disposal at a RCRA and/or TSCA-permitted and OSR-approved facility. After pressure washing the storm sewers, the interior of the pipes would be sealed with epoxy to prevent potential recontamination from outside material. The alternative assumes the Amcast South building remains intact, and no work is conducted inside the building. The alternative also assumes that any excavated soil surrounding the storm sewers would not be RCRA-regulated hazardous waste or exceed the TSCA disposal threshold of 50 mg/kg. Soil verification samples would be required to determine if soil with concentrations exceeding cleanup levels has been removed. The excavation would then be backfilled with clean soil and restored to its existing condition. There are no O&M costs associated with Alternative SSS-2 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $2,463,136, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

c) <u>SSS-3: Abandon Amcast South Storm Sewers, Excavation, Offsite Disposal, Backfill, and Site Restoration</u>

Estimated Capital cost: $2,218,400
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $2,218,400

Alternative SSS-3 consists of abandoning the Amcast South storm sewer system on the property by pumping a flowable concrete grout into the sewers and installing plugs at the extents of pipe abandonment. Alternative SSS-3 also consists of removing sediment and associated water in storm sewers downgradient of the Amcast South until the storm sewers discharge into Quarry or Wilshire Pond by pressure washing, excavating the soil surrounding impacted sewers with COC concentrations exceeding cleanup levels, followed by offsite disposal at RCRA and/or TSCA-permitted and OSR-approved facility. After pressure washing the storm sewers, the interior of the pipes would be sealed with epoxy to prevent potential recontamination from outside material. The alternative assumes the Amcast South building remains intact, and no work is conducted inside the building. The alternative also assumes that the excavated soil surrounding the storm sewers would not be RCRA-regulated hazardous waste or exceed the TSCA disposal threshold of 50 mg/kg. Soil verification samples would be required to determine if soil concentrations exceeding cleanup levels has been removed. The excavation would then be backfilled with clean soil and restored to its existing condition. There are no O&M costs associated with Alternative SSS-3 as no contamination will be left behind that would require long-

term maintenance. The total estimated present worth cost to implement this alternative is $2,218,400, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

d) SSS-4: Remove Storm Sewer Piping, Excavation, Offsite Disposal, Backfill, and Site Restoration (EPA's Selected Alternative)

Estimated Capital cost: $4,303,213
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: 2 months
Estimated Time to Achieve RAOs: 2 months
Estimated Total Present Worth cost: $4,303,213

Alternative SSS-4 consists of excavating and removing the onsite storm sewer piping outside of the building footprint. Alternative SSS-4 also consists of removing sediment and associated water in storm sewers downgradient of the Amcast South until the storm sewers discharge into Quarry or Wilshire Pond by pressure washing, excavating the soil surrounding impacted sewers with COC concentrations exceeding cleanup levels, followed by offsite disposal at RCRA and/or TSCA-permitted and OSR approved facility. After pressure washing the storm sewers, the interior of the pipes would be sealed with epoxy to prevent potential recontamination from outside material. The alternative assumes the Amcast South building remains intact. The alternative assumes that the excavated soil surrounding the storm sewers would not be RCRA-regulated hazardous waste or exceed the TSCA disposal threshold of 50 mg/kg. Soil verification samples would be required to determine if soil concentrations exceeding cleanup levels has been removed. The excavation would then be backfilled with clean soil and restored to its existing condition. There are no O&M costs associated with Alternative SSS-4 as no contamination will be left behind that would require long-term maintenance. The total estimated present worth cost to implement this alternative is $4,303,213, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 2 months.

8. Groundwater (Interim – Figure 10)

a) GW-1: No Action

Estimated Capital cost: $0
Estimated Annual O&M cost: $0
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: N/A
Estimated Total Present Worth cost: $0

Alternative GW-1 consists of taking no action. The no-action alternative would leave impacted groundwater in place at the Site. There are no capital or O&M costs

associated with Alternative GW-1. However, five-year site reviews would be required as long as hazardous substances remain at the site at concentrations that do not allow UU/UE.

b) GW-2: Institutional Controls and Groundwater Monitoring (EPA's Selected Alternative)

Estimated Capital cost: $636,551
Estimated Annual O&M cost: $170,037
Estimated Construction Timeframe: N/A
Estimated Time to Achieve RAOs: 30 years
Estimated Total Present Worth cost: $3,139,701

This alternative involves monitoring groundwater COCs with concentrations exceeding EPA MCLs and WDNR ESs and implementing ICs to restrict groundwater use and/or require engineering controls for VI, if necessary. The exposure risk at the Site related to groundwater is to a future resident on the Amcast North and Amcast South parcels Site via the inhalation pathway from VI. Monitoring would be conducted after the OU1 remedial actions are complete to monitor the effectiveness of the OU1 remedy at reducing COC concentrations in groundwater. ICs to require engineering controls such as a VI mitigation system would be implemented, if necessary. The ICs would prevent inhalation exposures to COCs for future residents and industrial workers. Although it is unlikely that Site groundwater will be used as a drinking water source in the future, there is currently no deed restriction in place or local regulations preventing use of Site groundwater. The groundwater use restriction ICs, if necessary, are anticipated to include deed restrictions and/or use of a local groundwater management zone for the site area and downgradient. There are no potable water wells in the area (drinking water is supplied by the City of Cedarburg from wells located elsewhere in the city), and the aquifer in which most of the elevated concentrations of Site contaminants were found is not anticipated to yield sufficient water for that use. However, adding groundwater use restrictions will layer additional protections to potential groundwater exposures in the future. EPA anticipates selecting a final groundwater remedy after further Site evaluation as part of OU2. The total estimated present worth cost to implement this alternative is $3,139,701, and it is anticipated that implementing this alternative to achieve RAOs will take a total of 30 years.

J. Comparative Analysis of Alternatives

1. Evaluation Criteria

Section 121(b)(l) of CERCLA presents several factors that EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial

alternatives. The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with federal and state ARARs (threshold criteria), consider technical or economic merits (primary balancing criteria), or involve the evaluation of non-EPA reviewers that may influence an EPA decision (modifying criteria). In order to be selected, an alternative has to meet the threshold criteria. These nine criteria are described below, followed by a discussion of how each alternative meets or does not meet each criterion.

Explanation of the Nine Evaluation Criteria

Threshold Criteria

(1) **Overall Protection of Human Health and the Environment** determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through ICs, engineering controls, or treatment.

(2) **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Primary Balancing Criteria

(3) **Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time once cleanup levels have been met. This criterion also incorporates an evaluation of climate resilience.

(4) **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of hazardous substances as a principal element.

(5) **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation until cleanup levels are achieved.

(6) **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services, and coordination with other governmental entities.

(7) **Cost** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth costs are the total costs of an alternative over time in terms of today's dollar value and incorporates a 7% discount factor. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Modifying Criteria

(8) **State/Support Agency Acceptance** considers whether the state support agency concurs with the selected remedy.

(9) **Community Acceptance** considers whether the public supports the selected remedy.

2. Comparative Analysis of Alternatives

In this section, the remedial alternatives are compared to each other in terms of how well they meet the specified evaluation criteria. Threshold and primary balancing criteria are presented and evaluated for each remedial alternative.

a) Overall Protection of Human Health and the Environment

EPA is required to select remedies that will protect human health and the environment. Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or ICs. For each sub-area of the Site, all of the retained alternatives – with the exception of each area's "No Action" alternative – would protect human health and the environment. Because the "No Action" alternative for each area would not protect human health and the environment, all of the "No Action" alternatives were eliminated from consideration and will not be discussed further in this ROD.

Amcast North Alternatives (Soil)

Alternative AMN-2 would provide the greatest degree of protection since this alternative would remove and dispose of contaminated media. Alternative AMN-3, which leaves contaminated material in place but beneath an isolation cover, only reduces overall risk but would provide adequate protection from exposure. Additionally, perpetual cap maintenance would be required to ensure total protectiveness and any breach in the cap would potentially expose individuals to unacceptable levels of contamination.

Residential Yards Alternatives (Soil)

Alternatives RY-2 and RY-3 provide a degree of protection as they both involve removing contaminated media above the corresponding cleanup levels. However, RY-3 would provide the greatest degree of protection since this alternative would remove and dispose of contaminated media down to a lower cleanup level.

Amcast South Alternatives (Soil)

Alternative AMS-4 would provide the greatest degree of protection since this alternative would remove and dispose of contaminated media, providing the highest level of protection based on the lowest clean up value. Alternative AMS-3, which leaves contaminated material in place but beneath an isolation cover, reduces overall risk and, if properly maintained, would provide adequate protection from exposure. Additionally, perpetual cap maintenance would be required to ensure long-term protectiveness. Any breach in the cap would potentially expose individuals to unacceptable levels of contamination. AMS-2 would provide less protection than AMS-4 given its higher cleanup level.

Quarry Pond Alternatives (Sediment)

Alternative QP-4 would provide the greatest degree of protection since this alternative would remove and dispose of contaminated media. Alternative QP-3, which leaves contaminated material in place covered with a reactive barrier reduces overall risk and properly maintained, would provide adequate protection from exposure. However, perpetual maintenance of the barrier would be required to ensure long-term protectiveness. Any breach in the barrier would potentially expose individuals to unacceptable levels of contamination. Alternative QP-2 would provide adequate protection for ecological receptors within the pond, but would require controls (e.g., signage) in perpetuity to mitigate human exposures above human health-based risk levels in sediments and fish tissues.

Wilshire Pond Alternatives (Sediment/Bank Soil)

Alternatives WP-2 and WP-3 would provide equivalent degrees of protection as they both propose to remove contaminated material. WP-3 accounts for removal of more contaminated material, if encountered, but the overall protection achieved by both alternatives is similar. However, WP-3 would only be triggered if the berms are found to be contaminated in the pre-design investigation.

Amcast North Storm Sewer Alternatives

All of the remaining alternatives presented achieve protection of human health and the environment. However, Alternative SSN-3 would provide the greatest degree of protection, since this alternative removes and disposes of sections of sewer pipes and

contaminated sediment versus sealing and leaving contaminated sewer piping in-place as proposed in SSN-2.

Amcast South Storm Sewer Alternatives

Alternative SSS-4 would provide the greatest degree of protection since this alternative removes and disposes of the contaminated sediment and pipes. Alternative SSS-3 abandons the storm sewers preventing exposure or transport of contaminated sediment and would be the next most protective alternative. Alternative SSS-2 would achieve protection of human health and the environment and would remove contaminated sediment from storm sewers.

Groundwater Alternatives (Interim)

Alternative GW-2 is the only remaining alternative and is protective, as ICs will restrict water use. This interim action will require a subsequent final cleanup decision.

b) Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP § 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as ARARs, unless such ARARs are waived under CERCLA § 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

In addition to ARARs, under 40 CFR § 300.400(g)(3) EPA may, as appropriate, identify other advisories, criteria, or guidance "to be considered" (TBC) when evaluating remedial alternatives.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver. EPA has identified ARARs and TBCs for this ROD in Table 11.

The key federal and state requirements identified as ARARs include the following:

- Wisconsin's water quality standards [WAC NR 102.04(1)(a) and (d) and WAC NR 105.06], as well as federal 40 CFR Part 132, are applicable to Wilshire and Quarry Ponds; WAC NR 140 is applicable to groundwater quality;
-WAC NR 207 Wisconsin Pollutant Discharge Elimination System regulations may be applicable or relevant and appropriate to groundwater treatment, sediment dewatering, or pond water removal;
- TSCA 40 CFR § 761.61(c) risk-based disposal approval for PCB remediation waste and soil and 40 CFR § 761.65(c) for PCB waste storage are the main federal action-specific regulations that are applicable to remedial actions at the Amcast Site.
- Although not an ARAR by definition, 40 CFR § 300.440 (the CERCLA Offsite Rule or OSR) is a regulation that must be complied with if waste is disposed offsite.

Other ARARs originating at the state level that may be/are applicable or relevant depending on alternatives chosen include:

- WAC NR 415 (fugitive dust emission standards);
- WAC NR 216 Subchapter III (WAC NR 216.46 and 216.47) for stormwater management;
- WAC NR 662 (management requirements for hazardous waste, if encountered);
- WAC NR 718 (storage, transportation, treatment, and disposal standards for excavated soil and other solid wastes);
- WAC NR 292.12 for maintenance of a sediment cap; and
- WAC NR 350-353 (wetland compensatory mitigation projects) if such a project is required for Wilshire or Quarry Ponds.

Amcast North Alternatives (Soil)

All remaining alternatives for this sub-area will comply with Federal and State ARARs and TBCs.

Residential Yards Alternatives (Soil)

Alternatives RY-2 and RY-3 will comply with Federal and State ARARs and TBCs.

Amcast South Alternatives (Soil)

Alternatives AMS-2, AMS-3 and AMS-4 will comply with ARARs and TBCs.

Quarry Pond Alternatives (Sediment)

Alternatives QP-2, QP-3 and QP-4 will comply with ARARs and TBCs.

Wilshire Pond Alternatives (Sediment/Bank Soil)

All remaining alternatives will comply with ARARs and TBCs.

Amcast North Storm Sewer Alternatives

All remaining alternatives will comply with ARARs and TBCs.

Amcast South Storm Sewer Alternatives

All remaining alternatives will comply with ARARs and TBCs.

Groundwater Alternatives (Interim)

Alternative GW-2 is an interim remedy and thus is not required to comply with all ARARs. The final OU2 Groundwater remedy will be required to comply with all ARARs or invoke an ARARs waiver. A further detailed analysis is not needed for the Groundwater Alternatives because there is only one alternative that meets the threshold criteria.

c) Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refer to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

Residential Yards Alternatives (Soil)

Alternative RY-3 is more protective than RY-2 as it addresses soils to a lower cleanup level at 0.22 mg/kg PCBs.

Amcast North Alternatives (Soil)

Alternative AMN-2 would result in the lowest residual risk after implementation. Alternative AMN-2 would not require maintenance and is more effective in assuring protection against potential exposures. The installation of an isolation cover for subsurface soils in Alternative AMN-3 will reduce exposure to residual contamination in surface soil but will not reduce residual risk at depth. Alternative AMN-3 requires long-term maintenance and inspection to monitor the integrity and

thickness of the isolation cover. There is the potential for the cover to be removed or disturbed depending on future site usage and activities. Thus, the adequacy and reliability of controls to prevent disturbance of the cover depend on maintenance and inspection and may be less effective in assuring protection against potential exposures in the long term. Additionally, this area is vulnerable to increased risk from tornadoes, severe thunderstorms, and flooding. As such, Alternative AMN-2 is more effective in the long term with no isolation cover that could be impacted by increased incidence of severe weather.

Amcast South Alternatives (Soil)

Alternative AMS-4 would result in the lowest residual risk after implementation than AMS-2, which addresses soils to a higher cleanup level (1 mg/kg PCBs), and AMS-3 which involves containment. Alternative AMS-4 would not require maintenance and is more effective in assuring protection against potential exposures. The installation of an isolation cover for subsurface soils in Alternative AMS-3 will reduce exposure to residual contamination in surface soil but will not reduce residual risk at depth. Alternative AMS-3 requires long-term maintenance and inspection to monitor the integrity and thickness of the isolation cover. There is the potential for the cover to be removed or disturbed depending on future site usage and activities. Thus, the adequacy and reliability of controls to prevent disturbance of the cover depend on maintenance and inspection and may be less effective in assuring protection against potential exposures. Additionally, this area is vulnerable to increased risk from tornadoes, severe thunderstorms, and flooding. As such, Alternative AMS-4 is more effective in the long term with no isolation cover that could be impacted by increased incidence of severe weather.

Quarry Pond Alternatives (Sediment)

Alternative QP-4 would result in the lowest residual risk after implementation for the Quarry Pond and less residual risk than QP-2 which addresses soils to a higher cleanup level (1.9 mg/kg PCBs), and QP-3 which relies on containment. Alternative QP-4 would not require maintenance and is more effective than QP-3 in assuring protection against potential exposures. The installation of a reactive barrier in Quarry Pond Alternative QP-3 will reduce exposure to residual contamination in surface sediment by absorbing the contaminants but will not reduce residual risk at depth. There is limited potential for the reactive barrier in Alternative QP-3 to be removed or disturbed by humans or the environment because the depth of water is up to 20 feet and other potential disturbances from tributary inlets/outlets or large wave action that could produce scouring velocities at depth are not present. In addition, placement of a 6-inch protective layer of 0.5-inch aggregate further minimizes the potential for disturbances. However, pond water levels are linked to groundwater levels and

precipitation. Thus, there may be an increased risk of cover disturbance during low groundwater level times. The adequacy and reliability of controls to prevent disturbance of the cover depend on long-term maintenance and monitoring to verify performance and thickness and, as such, are required.

Wilshire Pond Alternatives (Sediment/Bank Soil)

Alternatives WP-2 and WP-3 will result in low residual risk as a result of the excavation and offsite disposal of contaminated sediment and soil. Alternatives WP-2 and WP-3 would not require long-term maintenance and are effective in assuring protection against potential exposures.

Amcast North Storm Sewer Alternatives

In both Alternatives SSN-2 and SSN-3, contaminated sediment within storm sewer pipes would be removed from the Site, resulting in a very low residual risk from sewer sediment. The least amount of residual risk would occur as a result of excavation, removal, and offsite disposal of storm sewer pipes in Alternative SSN-3 as opposed to abandoning or pressure washing these pipes and leaving them in place in Alternative SSN-2. Both alternatives would not require long-term maintenance or controls and would protect human health and the environment once the remedial action is complete.

Amcast South Storm Sewer Alternatives

For all the remaining alternatives presented for this sub-area, contaminated sediment within storm sewer pipes would be removed from the site, resulting in a very low residual risk. The least amount of residual risk would occur as a result of excavation, removal, and offsite disposal of storm sewer pipes in Alternative SSS-4 as opposed to pressure washing or abandoning the pipes, then leaving them in place as proposed in Alternatives SSS-2 and SSS-3, respectively. Alternatives SSS-3 and SSS-4 would not require long-term maintenance or controls and protect human health and the environment once the remedial action is complete. Alternative SSS-2 may require periodic maintenance since the onsite storm sewers would remain in place.

d) Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. There are several components that compose evaluation of the reduction of toxicity, mobility, and volume.

Residential Yards Alternatives (Soil)

There is no treatment associated with Alternative RY-2 and RY-3.

Amcast North Alternatives (Soil)

There are no treatment processes associated with the implementation of Alternatives AMN-2 and AMN-3 as no material is being treated, and therefore there are no reductions in toxicity or volume (through treatment) for either of the alternatives. However, both alternatives reduce mobility of contaminated material. AMN-2 achieves mobility reduction by removing material from the Site and containing it at a disposal facility and AMN-3 achieves reduction by isolating material below a cover. Alternative AMN-2 is irreversible as contaminated material is being removed from the Site and would not be allowed to be brought back as fill. Likewise, for Alternative AMN-3, contaminated material would be removed from the Site and would not be allowed back onsite. However, Alternative AMN-3 is slightly more reversible than Alternative AMN-2 as the cover is removable. The amount of contaminated material after implementation of Alternative AMN-2 would be minimal. Contaminated material would remain onsite after the implementation of Alternative AMN-3 under an isolation cover. Treatment would not be performed in any of the alternatives for this sub-area.

Amcast South Alternatives (Soil)

No treatment processes are proposed in Alternatives AMS-4, AMS-2, and AMS-3, thus there are no reductions in toxicity or volume (through treatment) for each of the alternatives. However, all alternatives reduce mobility of contaminated material. AMS-4 and AMS-2 reduce mobility by removing material from the site and containing it at a disposal facility while AMS-3 reduces mobility by isolating it below a cover. Alternative AMS-2 and AMS-4 are irreversible as contaminated material is being removed from the site and would not be allowed to be brought back as fill. Likewise, for Alternative AMS-3, contaminated material would be removed from the Site and would not be allowed back onsite. However, Alternative AMS-3 is slightly more reversible than Alternatives AMS-2 and AMS-4 as the cover is removable. The amount of contaminated material left after implementation of Alternatives AMS-2 and AMS-4 would be minimal. Contaminated material would remain onsite after the implementation of Alternative AMS-3 under an isolation cover.

Quarry Pond Alternatives (Sediment)

There would be no treatment processes associated with the implementation of Alternatives QP-2 and QP-4 and therefore no hazardous materials would be destroyed, and there are no reductions in toxicity or volume through treatment. In Alternative QP-3, PCB-contaminated sediment would be covered with a PRB composed of 1 percent granular activated carbon (GAC) mixed with 99 percent sand,

and an organophilic clay layer. This is expected to reduce toxicity and mobility by absorbing PCBs into the GAC.

Alternatives QP-2 and QP-4 are irreversible as contaminated material would be removed from the Site and would not be allowed to be brought back as fill. Alternative QP-3 is slightly reversible as the PRB can be removed. However, due to the nature of the PRB, PCBs would be absorbed into the GAC and would be removed along with the barrier.

The amount of contaminated material left after implementation of Alternatives QP-2 and QP-4 would be minimal. Treatment is not performed in Alternative QP-2 or QP-4. Contaminated material would remain onsite after the implementation of Alternative QP-3 under a PRB.

Wilshire Pond Alternatives (Sediment/Bank Soil)

There are no treatment processes associated with the implementation of Alternatives WP-2 and WP-3 and therefore no hazardous materials would be destroyed and there would be no reductions in toxicity or volume through treatment. Alternatives WP-2 and WP-3 are irreversible as all contaminated material, above the cleanup level, would be excavated, disposed of offsite and would not be allowed to be brought back as fill.

Amcast North Storm Sewer Alternatives

There are no treatment processes with Alternatives SSN-2 and SSN-3, as no material would be treated, and no hazardous materials would be destroyed. Furthermore, the alternatives would not reduce the toxicity or the volume of contamination. Both alternatives would reduce mobility of contaminated material by removing it from the Site and containing it at a disposal facility and are irreversible.

Amcast South Storm Sewer Alternatives

There are no treatment processes with Alternatives SSS-2, SSS-3, and SSS-4 as no material would be treated and no hazardous materials would be destroyed. Furthermore, the alternatives would not reduce the toxicity or the volume of contamination. All three alternatives would reduce mobility of contaminated material by removing it from the Site and containing it at a disposal facility and are irreversible.

e) Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and

the environment during construction and operation of the remedy until cleanup levels are achieved.

Amcast North Alternatives (Soil)

Alternative AMN-3 may result in less potential for exposure to the community by inhalation or direct contact to construction workers because this alternative removes the least amount of material. Further, exposure to the community from dust during installation of a cover depends on whether the underlying material is dry or wet at the time of installation. Alternative AMN-2 has more material being removed and disposed and therefore more potential for exposure to the community and workers by air or direct contact. However, dust emissions from both alternatives can be controlled using standard engineering controls (*e.g.,* wet dust control, barrier tents), and trucks can be covered and decontaminated before leaving the Site. Soil will be disturbed, removed, and handled in both alternatives using properly designed equipment, but exposure to workers through direct contact is possible during construction of both alternatives. The higher volume of material removed and managed in Alternative AMN-2 could pose an elevated risk to workers. With properly executed Health and Safety Plans, the risks to workers for both of the remaining alternatives are minimal. Short-term environmental impacts are present in both alternatives as damage will occur during excavation. More excavation is anticipated with Alternative AMN-2 than AMN-3, and with these more potential impacts are projected. Both alternatives are anticipated to achieve RAOs after implementation of the remedial action and restoration of the habitat.

Amcast South Alternatives (Soil)

Alternative AMS-3 may result in less potential for exposure to the community by inhalation or direct contact to construction workers because this alternative removes the least amount of material. Further, exposure to the community from dust during installation of a cover depends on whether the underlying material is dry or wet at the time of installation. Alternatives AMS-2, and to a greater degree, AMS-4, have more material being removed and disposed than AMS-3 and, therefore, more potential for exposure to the community and workers by inhalation or direct contact. However, dust emissions from both alternatives can be controlled using standard engineering controls, and trucks can be covered and decontaminated before leaving the Site. Soil will be disturbed, removed, and handled in both alternatives using properly designed equipment, but direct contact to workers is possible during construction of both alternatives. The higher volume of material removed and managed in Alternatives AMS-2 and AMS-4 could pose an elevated risk to workers. With properly executed Health and Safety Plans, the risks to workers for all the remaining alternatives are minimal. Short-term environmental impacts are present in both alternatives as

accidents may occur during excavation. More excavation is anticipated with Alternatives AMS-2 and AMS-4 and with these alternatives more potential impacts are projected. Both alternatives are anticipated to achieve RAOs after implementation of the remedial action and restoration of the habitat.

Quarry Pond Alternatives (Sediment)

All of the remaining Quarry Pond Alternatives may result in a potential for exposure to the community and workers from dust emissions or direct contact to construction workers to the material removed. Exposure to the community and workers from dust during the installation of the reactive barrier should be considerably less in Alternative QP-3, as the cover will be placed under water. Alternatives QP-2 and QP-4 may result in a potential for exposure to the community and workers by inhalation or direct contact as material is being removed and disposed of. However, dust emissions can be controlled using standard engineering controls, and trucks can be covered and decontaminated before leaving the Site. With properly executed Health and Safety Plans, the risks to workers for all of the remaining alternatives are minimal.

Short-term environmental impacts include the disturbance and resuspension of sediment contamination into the water column during removal and/or submerged capping operations in Alternatives QP-3, QP-2, and QP-4. The resuspension of sediments during these activities may result in a short-term release of PCBs into the water column. Habitat damage due to excavation, as well as some materials used for the reactive cover, may occur during construction and would be present with all the alternatives.

Alternatives QP-4 and QP-2 would achieve RAOs after implementation of the remedial action and restoration of the habitat, though a period is required to reduce the PCB concentrations in fish tissue after contamination has been removed. Alternative QP-3 would require additional time in comparison as the reactive barrier needs time to react with and lower the PCB concentrations in sediment. QP-2 and QP-4 would require a similar period to reduce the PCB concentrations in fish tissue as QP-3.

Wilshire Pond Alternatives (Sediment/Bank Soil)

Both remaining Wilshire Pond Alternatives may result in a potential for exposure to the community and construction workers from dust emissions or direct contact to the material removed. However, dust emissions can be controlled using standard engineering controls, and trucks can be covered and decontaminated before leaving the Site. Since Alternative WP-3 has a higher volume of material removed and managed, the chance for risk to workers is greater, and the amount of protection

provided to the worker is lower than Alternative WP-2. With properly executed Health and Safety Plans, the risks to workers for both remaining alternatives are minimal.

Short-term environmental impacts include the disturbance and resuspension of sediment contamination into the water column and habitat damage during excavation of sediments and soils. Since more excavation is occurring in Alternative WP-3, the potential impacts are greater.

Alternatives WP-2 and WP-3 would achieve RAOs after implementation of the remedial action and restoration of the habitat, though a period is required to reduce the PCB concentrations in fish tissue.

Amcast North Storm Sewer Alternatives

Alternative SSN-3 may result in a potential for exposure to the community by inhalation or direct contact to construction workers as pipes are being pressure washed or abandoned. Alternative SSN-2 may result in a greater potential for exposure to the community by inhalation or direct contact to workers during excavation of pipes. However, dust emissions can be controlled using standard engineering controls, and trucks can be covered and decontaminated before leaving the Site. Alternative SSN-3 would pose the least amount of potential exposure to workers since pipe removal and disposal would occur with construction equipment. With properly executed Health and Safety Plans, the risks to workers for both remaining alternatives are minimal. Short-term environmental impacts are present in both alternatives since some damage will occur during excavation. Storm sewers onsite drain directly to Wilshire Pond, and pressure washing these storm sewers may wash contaminated sediment into this location, therefore the potential for additional environmental impacts is present in both the alternatives. Alternatives SSN-2 and SSN-3 would achieve RAOs after implementation of the remedial action.

Amcast South Storm Sewer Alternatives

Alternatives SSS-2 and SSS-3 may result in a potential for exposure to the community by inhalation or direct contact to construction workers as more pipes are being pressure washed and/or abandoned. Alternative SSS-4 may result in a greater potential for exposure to the community and workers by inhalation or direct contact during excavation of pipes. However, dust emissions can be controlled using standard engineering controls, and trucks can be covered and decontaminated before leaving the Site. Alternative SSS-4 would pose the least amount of potential exposure to workers since pipe removal and disposal would occur with construction equipment. Alternative SSS-2 would have a higher potential exposure to workers because pressure washing and coating pipes carry more risk to workers. With properly

executed Health and Safety Plans, the risks to workers for all the remaining alternatives are minimal. Short-term environmental impacts are present in all alternatives since some damage will occur during excavation. Storm sewers onsite drain directly to Quarry Pond and Wilshire Ponds, and pressure washing these storm sewers may wash contaminated sediment into these locations, therefore the greatest potential for additional environmental impacts is present in Alternatives SSS-2 and SSS-3. All alternatives would achieve RAOs after implementation of the remedial action.

f) Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Amcast North Alternatives (Soil)

Both of the remaining alternatives (AMN-2 and AMN-3) are relatively straightforward, have a proven record of performance, and have no anticipated implementation impediments. Standard construction equipment can be used for both alternatives and materials required are readily available. Additional remedial actions would be easy to implement under either alternative should they be necessary. However, additional remedial actions following Alternative AMN-3 would need to take into consideration the isolation cover. There are no impediments to monitoring the effectiveness of Alternative AMN-2. Since the isolation cover in Alternative AMN-3 will be covered by fill, monitoring may be challenging. Both alternatives use known technologies with proven effectiveness so any administrative approvals would be obtained easily. For both alternatives, there are no impediments to offsite storage and disposal services because it is anticipated that local disposal facilities will have enough capacity for soil volumes being removed.

Amcast South Alternatives (Soil)

All of the remaining alternatives (AMS-2, AMS-3, AMS-4) are relatively straightforward, have a proven record of performance, and have no anticipated implementation impediments. Standard construction equipment can be used for the alternatives and materials required are readily available. Additional remedial actions would be easy to implement under all alternatives should they be necessary. However, additional remedial actions following Alternative AMS-3 would need to take into consideration the isolation cover. There are no impediments to monitoring effectiveness of Alternative AMS-2 and AMS-4. Since the isolation cover in Alternative AMN-3 will be covered by fill, monitoring may be challenging. All

alternatives use known technologies with proven effectiveness so any administrative approvals would be obtained easily. For all alternatives, there are no impediments to offsite storage and disposal services because it is anticipated that local disposal facilities will have enough capacity for soil volumes being removed.

Quarry Pond Alternatives (Sediment)

Excavation, dewatering, offsite disposal, and restoration, called for in Alternatives QP-2 and QP-4, are relatively straightforward, have a proven record of performance, and have no anticipated implementation impediments. Consistent thickness of a reactive cover in Alternative QP-3 can be difficult to achieve in some Site conditions. Standard construction equipment can be used for all alternatives and materials required are readily available. The only impediments to monitoring effectiveness for Alternative QP-4 will be the depth of water within the pond post-completion. Long-term monitoring would not be anticipated with Alternatives QP-2 and QP-4 once fish tissue goals are met. For Alternative QP-3, not only will the depth of water impede monitoring effectiveness, but it may be difficult to measure consistent thicknesses of the PRB, especially in deeper water. Long-term monitoring and inspection would be required for Alternative QP-3 to document reliability and the reactive cover may require replacement as material is exhausted or may require replacement if material is shifted out of place because of erosion or differential settlement. Additional remedial actions would be easy to implement under all the alternatives. However, additional remedial activities will need to take into account because of the PRB in Alternative QP-3. Alternatives QP-2 and QP-4 use known technologies with proven effectiveness so any administrative approvals would be obtained easily as well as easily coordinated with other agencies. Alternative QP-3 also uses known technologies with proven effectiveness so administrative approvals would be obtained easily. For all alternatives, there are no impediments to offsite storage and disposal services because it is anticipated that local disposal facilities will have enough capacity for soil volumes being removed.

Wilshire Pond Alternatives (Sediment/Bank Soil)

Excavation, dewatering, offsite disposal, and restoration, called for in Alternatives WP-2 and WP-3, are relatively straightforward, have a proven record of performance, and have no anticipated implementation impediments. Standard construction equipment can be used for both alternatives and materials required are readily available. The only impediments to monitoring effectiveness for Alternatives WP-2 and WP-3 will be the depth of water within the pond post completion. Additional remedial actions would be easy to implement under all the alternatives. Long-term monitoring would not be anticipated with Alternatives WP-2 and WP-3 once fish tissue goals are met. Alternatives WP-2 and WP-3 use known technologies with

proven effectiveness so administrative approvals would be obtained easily as well as coordination with other agencies. For both alternatives, there are no impediments to offsite storage and disposal services because it is anticipated that local disposal facilities will have enough capacity for soil volumes being removed.

Amcast North Storm Sewer Alternatives

Both the remaining alternatives, Alternatives SSN-2 and SSN-3, are relatively straightforward, have a proven record of performance, and have no anticipated implementation impediments. Standard construction equipment can be used for both alternatives and materials required are readily available. Additional remedial actions would be easy to implement under both alternatives, should they be necessary. Pressure washing, which is conducted in both alternatives, is generally reliable but will require monitoring and inspections to verify that all contaminated sediment has been removed. The only impediment for monitoring the effectiveness of each of the alternatives is the in-pipe video equipment and the quality of the video feed provided when performing the pressure washing. Additional remedial actions would be easy to implement under both alternatives should they be necessary. There are no impediments to coordination with other agencies. The alternatives use known technologies with proven effectiveness so administrative approvals would be obtained easily. For both alternatives, there are no impediments to offsite storage and disposal services because it is anticipated that local disposal facilities will have enough capacity for soil volumes being removed.

Amcast South Storm Sewer Alternatives

All the remaining alternatives, Alternatives SSS-2, SSS-3, and SSS-4, are relatively straightforward, have a proven record of performance, and have no anticipated implementation impediments. Standard construction equipment can be used for all alternatives and materials required are readily available. Additional remedial actions would be easy to implement under all alternatives, should they be necessary. Pressure washing, which is conducted in all alternatives, is generally reliable but will require monitoring and inspections to verify that all contaminated sediment has been removed. The only impediment for monitoring the effectiveness of each of the alternatives is the in-pipe video equipment and the quality of the video feed provided when performing the pressure washing. Additional remedial actions would be easy to implement under all alternatives should they be necessary. There are no impediments to coordination with other agencies. The alternatives use known technologies with proven effectiveness so administrative approvals would be obtained easily. For all alternatives, there are no impediments to offsite storage and disposal services because it is anticipated that local disposal facilities will have enough capacity for soil volumes being removed.

g) Cost

An overview of the cost analysis and the detailed breakdowns for each of the alternatives are presented in the March 13, 2023, Technical Memorandum for the Site. EPA uses the total present worth costs for purposes of comparing the costs of the various alternatives. Costs for all the alternatives were estimated and considered to be accurate within the +50/-30 percent range. The total present worth costs were calculated using a discount rate of 5 percent. The estimated present worth costs for the remaining alternatives are listed below by sub-area in ascending order.

Amcast North Alternatives (Soil)

AMN-3	$2,136,622
AMN-2	$3,080,493

Residential Yards Alternatives (Soil)

RY-2	$3,137,495
RY-3	$3,793,290

Amcast South Alternatives (Soil)

AMS-3	$5,347,040
AMS-4	$7,933,312
AMS-2	$8,822,056

Quarry Pond Alternatives (Sediment)

QP-3	$8,271,796
QP-2	$8,398,937
QP-4	$12,140,519

Wilshire Pond Alternatives (Sediment/Bank Soil)

WP-2	$1,861,895
WP-3	$2,252,332

Amcast North Storm Sewer Alternatives

SSN-2	$3,007,513
SSN-3	$3,122,871

Amcast South Storm Sewer Alternatives

SSS-3	$2,218,400
SSS-2	$2,463,136
SSS-4	$4,303,000

Groundwater Alternatives (Interim)

GW-2	$3,139,701

h) State Acceptance

The State of Wisconsin concurs with the selection of the alternatives identified as EPA's Preferred Alternative in the Proposed Plan (AMN-2, RY-3, AMS-4, QP-4, WP-2/3, SSN-3, SSS-4, GW-2), because it will meet the objective of allowing maximum beneficial reuse (residential) of the Amcast North and South parcels and remove unacceptable risks in the surrounding ponds and residential yards, requiring no ICs. The state's concurrence letter is included as Attachment 4.

i) Community Acceptance

EPA received numerous written comments from the community on the Proposed Plan. The majority of the comments supported the alternatives identified as EPA's Preferred Alternative. A full response to public comments is included later in this ROD in Part 3 – Responsiveness Summary.

K. Principal Threat Waste

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site whenever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. EPA has defined principal threat wastes as those source materials considered to be highly toxic or highly mobile and cannot be reliably contained, or would present a significant risk to human health and the environment should exposure occur.

The statutory preference for treatment of principal threat wastes does not apply for this remedy, because there is no principal threat waste being addressed in this remedial action.

L. Selected Remedy

1. Summary of the Rationale for the Selected Remedy

EPA has selected the following alternatives for each of the eight sub-areas as the best balance of the nine evaluation criteria. These alternatives were presented as EPA's Preferred Alternative in the Proposed Plan, with additional modifications made to

Alternative AMN-2 based on comments received from the public during the public comment period.

Area	Alternative Selected
Amcast North	AMN-2 (modified): Concrete Sampling and Pressure Washing/Removal, Excavation, Offsite Disposal, Backfill and Site Restoration
Residential Yards	RY-3: Soil Excavation, Offsite Disposal, Backfill, and Site Restoration
Amcast South	AMS-4: Excavation, Offsite Disposal, Backfill, and Site Restoration
Quarry Pond	QP-4: Sediment Dredging to 1 mg/kg PCBs, Bank Soil Excavation, Offsite Disposal, Residual Management Layer and Site Restoration
Wilshire Pond	WP-2/3: Sediment and Bank Soil Excavation, Offsite Disposal, Backfill, and Site Restoration
North Storm Sewers	SSN-3: Abandon Amcast North Building Storm Sewers, Remove Non-Building Storm Sewer Piping, Excavation and Backfill, Pressure Wash Non-Building Storm Sewers, Off-site Disposal, and Site Restoration
South Storm Sewers	SSS-4: Remove Storm Sewer Piping, Excavation, Offsite Disposal, Backfill, and Site Restoration
Groundwater (Interim)	GW-2: Institutional Controls and Groundwater Monitoring

Under CERCLA, the selected remedy must meet the threshold criteria of Overall Protection of Human Health and the Environment, and Compliance with ARARs. The alternatives selected protect human health and the environment by removing all impacted soils and sediments that pose an unacceptable human health risk, as well as reducing unacceptable bioaccumulative exposures to fish that could be potentially consumed by humans. The alternatives chosen are also compliant with all ARARs and TBCs identified in Table 11.

In addition to meeting the two threshold criteria, the selected remedial alternatives address the five balancing criteria in the following ways:

Long-term Effectiveness and Permanence: The selected remedial alternatives are effective long-term because they remove unacceptable risks in soil and restore conditions in Quarry Pond to achieve a long-term goal of reducing fish tissue contamination to allow for human consumption, without the need for long-term ICs.

Reduction of Toxicity, Mobility, or Volume through Treatment: Though the selected remedial alternatives do not include treatment, it is generally accepted that PCBs are difficult to remove through treatment, and thus removal and disposal is the most effective means of mitigating PCB exposure risks.

Short-Term Effectiveness: Removal of impacted soils and sediments is immediately effective at mitigating risks posed by these soils and sediments in their current environment. Fish tissue contamination is expected to take longer to mitigate but removal of impacted sediments and the use of a residual management layer is expected to accelerate reduction of PCB contamination in fish.

Implementability: Soil excavation and sediment dredging are relatively straight-forward techniques that are simple to implement.

Cost: The total estimated cost for the selected alternatives is $39,571,597. Several of the selected alternatives are not the lowest-cost option, but the additional costs are balanced by the evaluation criteria including substantial short-term risk reduction and the lack of the need for long-term ICs and monitoring that would be required if alternatives leaving contamination in place were chosen.

All the selected alternatives are generally accepted by the community as well as the State of Wisconsin, meeting the evaluation criteria of state and community acceptance. A modification was made to Alternative AMN-2 to address public comments received (see "Documentation of Significant Changes" section below for more information) during the public comment period.

2. Description of Selected Remedy

A detailed description of the remedy components for each of the eight sub-areas of the Site is included below.

a) Amcast North: Concrete Sampling and Pressure Washing/Removal, Excavation, Offsite Disposal, Backfill and Site Restoration

Additional pre-design soil sampling will be conducted as necessary to better define the extent of contaminated soil requiring excavation. The concrete slab foundation at the Amcast North property will be assessed for current levels of PCB contamination in the slab by collecting concrete core samples at various locations. This is a modification to the Preferred Alternative presented in the Proposed Plan based on comments received from the public during the public comment period and is discussed in further detail in the Documentation of Significant Changes section below. The wipe samples collected in 2007 by Amcast show surficial PCB contamination present, but as unsealed concrete is a porous material not suitable for wipe sampling, core samples will serve as a better indicator of suitability for re-use of

the slab. Once areas are identified containing COCs above cleanup levels, the concrete slab will be either power-washed and re-sampled, or excavated and disposed of in an appropriate landfill (TSCA or RCRA Subtitle D, and OSR-compliant). Soil containing COCs above cleanup levels will be excavated and disposed of in an appropriate landfill. Excavated areas will then be filled with clean soil and restored to their existing condition.

b) Residential Yards – RY-3: Soil Excavation, Offsite Disposal, Backfill, and Site Restoration

Soil will be excavated on all residential properties in the Residential Yards area (between Hamilton Road, Park Lane, Wilshire Drive, and the railroad tracks north of the Amcast North parcel) exhibiting PCB contamination above the residential cleanup level of 0.22 mg/kg. Contaminated soil will be disposed of in an appropriate landfill (TSCA or RCRA Subtitle D, and OSR-compliant). It is estimated that contamination is limited to surface soil; properties will initially be excavated to a 2-foot depth, and the bottoms of the excavation will be sampled to confirm the remaining soil does not contain PCBs above the residential cleanup level. Soils in the yards will be excavated further to remove additional contaminated material as necessary to a maximum depth of 4 feet.

After excavation, clean fill and topsoil will be placed on the property until the property reaches its pre-existing grade. Vegetation will then be installed to replace, as closely as practicable, pre-existing vegetation.

The majority of the samples collected in the Residential Yards area were collected between 2003 and 2005. In order to assess if any further migration of contamination from Amcast North has impacted nearby yards that were not impacted during past sampling, properties within the Residential Yards that previously were not identified as contaminated but are adjacent to contaminated areas will be re-sampled and excavated as necessary if re-sampled areas exhibit concentrations above cleanup levels.

c) Amcast South – AMS-4: Excavation, Offsite Disposal, Backfill, and Site Restoration

Additional pre-design soil sampling will be conducted as necessary to better define the extent of contaminated soil requiring excavation. Soil containing COCs above cleanup levels will be excavated and disposed of in an appropriate landfill (TSCA or RCRA Subtitle D, and OSR-compliant). Verification samples will be collected to document that soil concentrations exceeding cleanup levels have been removed. The excavation will then be filled with clean soil and restored to its existing condition (asphalt pavement or grass seed depending on location).

d) Quarry Pond – QP-4: Sediment Dredging, Bank Soil Excavation, Offsite Disposal, Residual Management Layer and Site Restoration

Remediation of Quarry Pond will take place after cleaning of Amcast North and South storm sewers is complete in order to avoid re-contamination of Quarry Pond sediments. Sediments will be allowed to fully settle in the pond before dredging to ensure contaminated suspended sediments from the sewers are collected during dredging.

Sediment and bank soils containing PCB contamination above the 1 mg/kg cleanup level will be dredged and excavated from Quarry Pond. After dredging, sediment samples will be collected to calculate a SWAC to compare to the post-dredging SWAC goal of 0.5 mg/kg PCBs. If necessary, further dredging will be conducted until the SWAC meets the post-dredging goal of 0.5 mg/kg PCBs. Dewatered dredging spoils and excavated soil will be disposed of at a RCRA- and/or TSCA-permitted and OSR-approved facility, and excavated banks will be back-filled with clean soil after verification sampling. A residual management layer consisting of 3-6 inches of clean sand will be applied after dredging to contain residual PCB contamination. A baseline sampling of fish tissue will be conducted after dredging is complete. Periodic fish tissue and sediment sampling will be conducted to assess progress to the long-term SWAC cleanup level of 0.25 mg/kg and fish tissue cleanup level of 0.025 mg/kg (see Five Year Reviews section below for more information). It is expected, by dredging to a short-term SWAC of 0.5 mg/kg PCBs and applying a residual management layer, that over time further deposition of unimpacted sediments within the pond will result in achieving the long-term SWAC goal of 0.25 mg/kg PCBs.

Current signage at Quarry Pond will be assessed to ensure it is effectively warning the public of potential exposure risks, and additional signage will be added as needed to continue to advise against fishing in Quarry Pond until long-term cleanup goals have been reached.

e) Wilshire Pond – WP-2/3: Sediment and Bank Soil Excavation, Offsite Disposal, Backfill, and Site Restoration

Remediation of Wilshire Pond will take place after cleaning of Amcast North and South storm sewers is complete in order to avoid re-contamination of Wilshire Pond sediments. Sediments will be allowed to fully settle in the pond before dredging to ensure contaminated suspended sediments from the sewers are collected during dredging.

The remedial alternatives WP-2 and WP-3 for Wilshire Pond were combined due to the possibility of PCB contamination in the bermed portion of Wilshire Pond. Both alternatives consist of the same components with the exception that in Alternative

WP-3 the berms separating the basins are assumed to be contaminated. Before dredging, the bermed portions of Wilshire Pond will be sampled to confirm the presence or absence of PCB contamination within the berms. After confirmation sampling, the pond basins, bank soils, and berms (as appropriate) will be dredged to remove PCB contamination above the 1 mg/kg cleanup level. Verification samples will be collected after excavation and dredging to document that soil and sediment with concentrations exceeding cleanup levels has been removed. Dewatered dredging spoils and excavated soil will be disposed of at a RCRA- and/or TSCA-permitted and OSR-approved facility, and excavated banks will be back-filled with clean soil after verification sampling. The slopes of the basins would then be restored to stable conditions.

f) North Storm Sewers – SSN-3: Abandon Amcast North Building Storm Sewers, Remove Non-Building Storm Sewer Piping, Excavation and Backfill, Pressure Wash Storm Sewers, Off-site Disposal, and Site Restoration

Sewers on the Amcast North property will be pressure-washed to rinse water and PCB-contaminated sediments downstream to Wilshire Pond. Additionally, the storm sewer line connecting Wilshire Pond to Cedar Creek will be pressure-washed upslope to Wilshire Pond. After pressure washing, the interiors of the pipes will be sealed with epoxy to prevent re-contamination from any residual PCB contamination present in surrounding material.

After pressure washing, the sewers underneath the Amcast North former building slab will be abandoned near the perimeter of the slab, and the approximately 20-foot storm sewer line connecting Amcast North to the surrounding storm sewer system will be removed. The area excavated around this line will be backfilled with clean fill and restored to the prior grade after collecting samples to verify contaminated material has been removed, with excavated soil and sewer piping disposed of at a RCRA- and/or TSCA-permitted and OSR-approved facility.

g) South Storm Sewers – SSS-4: Remove Storm Sewer Piping, Excavation, Offsite Disposal, Backfill, and Site Restoration

Sewers on the Amcast South property will be pressure-washed to rinse water and PCB-contaminated sediments downstream to Quarry or Wilshire Ponds. After pressure washing, the interiors of the pipes will be sealed with epoxy to prevent re-contamination from any residual PCB contamination present in surrounding material.

After pressure washing, the sewers on the Amcast South parcel will be removed, except sewers located under the building footprint. The area excavated around these sewers will be backfilled with clean fill and restored to the prior grade after collecting samples to verify contaminated material has been removed, with excavated soil and

sewer piping disposed of at a RCRA- and/or TSCA-permitted and OSR-approved facility.

h) <u>Groundwater (Interim) – GW-2: Institutional Controls and Monitoring</u>

Existing groundwater data will be reviewed, and up to five additional monitoring wells will be installed to better assess the known extents of groundwater contamination. All existing wells will be re-developed or abandoned as appropriate. After completing OU1 remedial activities, groundwater monitoring will be conducted for up to eight quarters (or two years) to assess any changes in groundwater quality. Monitoring wells will be initially sampled for the following constituents identified as groundwater COCs in the HHRA and requested by the State of Wisconsin:

Metals	PAHs	Non-PAH Organics	Other
Arsenic	Benzo(a)anthracene	1,1'-Biphenyl	PCBs
Chromium	Benzo(a)pyrene	1,2,4-Trimethylbenzene	Per- and Poly-fluoroalkyl Substances (PFAS)
Copper	Benzo(b)fluoranthene	Benzene	
Iron	Benzo(k)fluoranthene	bis(2-ethylhexyl)phthalate	
Lead	Chrysene	Bromodichloromethane	
Manganese	Dibenzo(a,h)anthracene	Chloroform	
	Indeno(1,2,3-cd)pyrene	Ethylbenzene	
		Hexachloroethane	
		Naphthalene	
		Pentachlorophenol	

After conclusion of the first eight quarterly monitoring events, groundwater data will be reviewed to assess any need for changing the monitoring constituent list, and monitoring will transition to semi-annual (twice a year).

ICs may be necessary to prevent exposures; the need for ICs will be assessed after conclusion of the first eight quarterly monitoring periods and implemented as necessary (see Institutional Controls section below).

The majority of the components of this remedy will not leave residual contamination in place above applicable cleanup levels, and thus do not require ICs to be protective after conclusion of the remedy. However, the interim remedy for groundwater may require ICs restricting the use of contaminated Site groundwater for drinking water, prohibiting the installation of wells in the extent of contamination, and requiring

vapor intrusion mitigation measures for any future residential development over the contaminated plume if a complete VI exposure pathway is determined. EPA anticipates selecting a final groundwater remedy after further Site evaluation as part of a final OU2 ROD.

Monitoring wells at the Site have not been sampled since 2011. After completing the initial eight quarterly groundwater monitoring events described in the groundwater interim remedy, EPA will determine the need for ICs based on results of current groundwater data. Necessary ICs will be established by EPA in coordination with WDNR's Continuing Obligations program (https://dnr.wisconsin.gov/topic/Brownfields/Residual.html).

3. Summary of the Estimated Remedy Costs

The information in the cost estimate summary tables (Tables 12.1 through 12.9) is based on the best available information regarding the anticipated scope of the selected remedy in each sub-area. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the AR file, an Explanation of Significant Difference document, or a ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost. The 'worst-case' scenarios for the selected remedy were assumed in the cost estimates for Amcast North (removal of contaminated concrete versus pressure washing) and Wilshire Pond (complete excavation and replacement of the berms).

The total estimated cost for the selected remedy is $39,571,597 (Table 12.10).

4. Expected Outcomes of Selected Remedy

The selected remedy is expected to restore soils at the Site to conditions which will allow for unrestricted (e.g., residential) use of Site land. This will allow for re-development of the Site into more beneficial uses (such as multi-unit residential development), which is expected to be a source of additional tax revenue for the City of Cedarburg. In addition, this remedy will allow for expanded recreational use of Quarry Pond in Zeunert Park, and once the fish tissue cleanup goal of 0.025 mg/kg PCBs is achieved, allow for recreational fishing and consumption of Quarry Pond fish. It is expected that short-term RAOs for the remedy can be achieved within one year of construction completion; sediments and fish tissue will be monitored periodically after construction completion to monitor progress toward long-term RAOs.

M. Statutory Determinations

Under CERCLA § 121 and the NCP (40 CFR § 300.430(f)(5)(ii)), EPA must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified; not applicable here), are cost-effective, and utilize

permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes. The following sections discuss how the selected remedy meets these statutory requirements.

1. Protection of Human Health and the Environment

The selected remedy will protect human health and the environment by eliminating exposures above unacceptable risk levels to human health receptors though the excavation of contaminated soil from residential properties, allowing for the residential use of former industrial properties, and removing contamination in pond sediments to prevent further bioaccumulation by fish. The selected remedy will reduce potential human health risk levels to within EPA's acceptable cancer risk range (1×10^{-4} to 1×10^{-6}) and below EPA's acceptable HI of 1. The remedy will not pose any unacceptable short-term risks.

2. Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all ARARs that pertain to the Site. The ARARs for the selected remedy are listed and described in Table 11 of this ROD.

3. Cost-Effectiveness

A remedy is considered cost-effective in the NCP if "its costs are proportional to its overall effectiveness" (see the NCP at 40 CFR § 300.430(f)(ii)(D)). This evaluation was accomplished by evaluating the overall effectiveness of those remedial alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (short-term effectiveness; long-term effectiveness and permanence; and reduction in toxicity, mobility, and volume through treatment). Overall effectiveness was then compared to the estimated costs to determine cost-effectiveness. The relationship of the overall effectiveness of the selected remedial action was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

4. Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at OU1 of the Site. While there are not practical commercial technologies for the treatment of PCBs that could be utilized, the remedy selected permanently removes contaminated

material through dredging and excavation of contaminated sediments and soils, eliminating any potential future exposure risks.

5. Preference for Treatment Which Permanently and Significantly Reduces the Toxicity, Mobility, or Volume of the Hazardous Substances as a Principal Element

None of the media addressed in this remedial action constitute principal threat waste at the Site, so the preference for treatment of principal threat waste does not apply.

6. Five-Year Review Requirements

CERCLA § 121(c) and the NCP § 300.430(f)(5)(iii)(C) provide the statutory and legal bases for conducting Five-Year Reviews. Given it is expected that sediment stabilization and fish tissue PCB reduction in Quarry Pond will take several years after construction of the remedy to be achieved, a statutory review will be conducted after the start of the remedy implementation at least every five years to assess the progress toward the long-term goals for fish tissue (0.025 mg/kg PCBs) and Quarry Pond sediment quality (SWAC of 0.25 mg/kg PCBs). Five-year reviews will be conducted until long-term RAOs are achieved to ensure that the remedy is, or will be, protective of human health and the environment.

N. Documentation of Significant Changes

CERCLA § 117(b) and NCP § 300.430(f)(5)(iii) require an explanation of any significant changes from the remedy presented in the Proposed Plan that was published for public comment. The Proposed Plan for OU1 was released for public comment on May 12, 2023, and the public comment period ran through June 12, 2023. Based upon review of the written and oral comments received from the public on the Proposed Plan, EPA determined that additional measures should be added to Amcast North alternative AMN-2 to address uncertainties regarding the concrete slab foundation of the former Amcast North facility building. EPA conducted a risk assessment evaluation of the data, summarized in a July 25, 2023 memo in the AR, and made changes to Alternative AMN-2 based on this evaluation. The changes are described in Section L.2.a above, and include the addition of concrete core sampling followed by pressure washing and/or concrete removal to remove any PCB contamination present in the concrete slab above the 0.22 mg/kg cleanup goal (if any). These additional measures will aid in determining the suitability of re-use of the concrete slab foundation for residential development and remove any unacceptable risks presented by contamination within the slab. The addition of these measures to Alternative AMN-2 increased the estimated cost in the Proposed Plan by $94,011 for a new total of $3,080,493.

PART 3: RESPONSIVENESS SUMMARY

In accordance with CERCLA § 117, 42 U.S.C. § 9617, EPA released the Proposed Plan and Administrative Record on May 12, 2023, and the public comment period ran through June 12, 2023, to allow interested parties to comment on the Proposed Plan. EPA held a public meeting regarding the Proposed Plan on May 31, 2023, at the Cedarburg Community Gym in Cedarburg, Wisconsin. Approximately 50 people attended the public meeting. Representatives from EPA, WDNR, and the Wisconsin Department of Health Services were present at the public meeting.

This Responsiveness Summary provides both a summary of the public comments EPA received regarding the Proposed Plan and EPA's response to those comments. EPA received written comments (handwritten and via regular and electronic mail) during the public comment period. There was also an opportunity to make verbal comments at the public meeting, although no one made verbal comments. In total, comments were received from 20 different people or organizations, including a concerned citizen, commercial landowners, and an environmental consultant. A copy of the comments received are included in the AR for the Site. The AR index is included as Attachment 3 to this ROD.

EPA, in consultation with WDNR, carefully considered all of the information in the Administrative Record prior to selecting the remedy documented in this ROD. Complete copies of the Proposed Plan, Administrative Record, and other pertinent documents are available at the Cedarburg Public Library, W63N589 Hanover Ave., and Cedarburg City Hall, W63N645 Washington Ave. in Cedarburg, Wisconsin, as well as the EPA Region 5 Records Center, 77 West Jackson Boulevard, 7th floor, Chicago, Illinois.

A written transcript from the public meeting and the written comment received in entirety can be found in the AR.

A. Overview

At the time of the public comment period, EPA had proposed a Preferred Alternative for Amcast North – AMN-2 of the Site in the May 12, 2023 Proposed Plan, which involved soil excavation, sewer cleaning and removal, sediment dredging, and groundwater monitoring. However, based on the comments received during the public comment period, the Cedarburg community and the WDNR support adding modifications to AMN-2 as described in the preceding sections.

B. Stakeholder Comments and Lead Agency Responses

Comment 1: *Several commenters raised concerns about the timeline for completion of the remedy.*

EPA Response: EPA appreciates the community's desire to restore the Site as soon as practicable. All site cleanups conducted under CERCLA require following a multi-step

process outlined in the NCP which often takes years, if not decades, to complete. For the Amcast Site, some recent milestones in this process have included completing the RI in 2015, completing the Feasibility Study in 2020, and proposing a remedy to the public in 2023, concluding with the publication of this ROD. The first activity after publication of this ROD will be to conduct a more detailed remedy design which will set the specifics for a contractor to be able to implement the selected remedy effectively. EPA will communicate with the City of Cedarburg and the public throughout this process to keep stakeholders informed of progress.

Comment 2: *Several commenters asked about the source of funding for the remedy.*

EPA Response: This remedy will be funded by the federal government using the Superfund trust fund monies. There is no viable responsible party to pay for the remedy due to Amcast's bankruptcy in 2005.

Comment 3: *A commenter proposed an alternative novel technology for* in situ *remediation of PCBs in sediments.*

EPA Response: Technologies were evaluated and screened as part of the Feasibility Study process, which was conducted from 2015 and concluded in the 2020 Feasibility Study report (Section 3, Technology Screening). EPA evaluated established effective technologies available at the time in proposing the remedial alternatives described in the Proposed Plan and this ROD. The selected remedy has proven to be effective for PCB contamination at many Superfund sites across the country.

Comment 4: *A commenter asked if the acquisition of the Amcast North and South parcels by a developer in 2018, or the creation of a Tax Increment Financing district on the Amcast North and South parcels by the City of Cedarburg, have impacted the Superfund process for the Site or the timeline for conducting the remedial action.*

EPA Response: No. EPA has participated in several meetings with the City of Cedarburg for general awareness of any planned redevelopment activities to take place after EPA completes the cleanup at the Site. However, the existence of tax increment districts or redevelopment plans have not impacted the process EPA is following to complete the cleanup, nor has it impacted the projected timeline for cleanup.

Comment 5: *Several community members raised concerns about the current owner of the Amcast North and South property, and asked if there are any impacts on the cleanup from pending enforcement proceedings at other sites between the owner and WDNR.*

EPA Response: No, the current owner of the Amcast North and Amcast South properties' activities on other sites, and any pending enforcement actions related to those sites being pursued by the State of Wisconsin, do not impact activities being conducted by EPA at the

Amcast Site. In addition, the current owner is not conducting any work under the cleanup described in this ROD, which will be conducted under EPA oversight by an EPA contractor or the United States Army Corps of Engineers. EPA will continue to coordinate with the WDNR and review any pertinent information as it is made available.

Comment 6: *Was the public comment meeting on 5/31/23 recorded and available for viewing?*

EPA Response: The public meeting held on May 31st, 2023 was not recorded. However, a court reporter was present to create a transcript of the meeting, which is available in the AR.

Comment 7: *A commenter asked if EPA has stopped any development on the Amcast North property or if EPA would stop development if a plan was presented for redevelopment of the property.*

EPA Response: EPA's mission is to protect human health and to safeguard the natural environment. In support of this mission, the Superfund program responds to threats posed by uncontrolled releases of hazardous substances into the air, water, and soil. In addition to protecting public health and restoring the environment, Superfund cleanups support positive economic and social outcomes in communities. Many sites – often vacant and underused areas – can be reused after cleanup and become valuable local assets. EPA supports redevelopment of Superfund sites for beneficial reuse, and the intent of the remedy selected in this ROD in part is to allow the development of Amcast North and South into residential property in the future. It is EPA's understanding that the current owner intends to develop both parcels into residential property after EPA completes the remedial activities described in this ROD. Under CERCLA § 101(40), an owner does not assume any legal responsibility for the contamination present on Amcast North and South if the conditions of that section are met. Therefore, EPA must conduct the cleanup to restore both parcels to conditions permitting residential use prior to any development taking place. However, EPA has communicated to the City of Cedarburg and the current owner that EPA can review and approve some development work to take place prior to completing the entire selected remedy at the areas being remediated, as long as the work does not impact EPA's ability to fully implement the selected remedy described in this ROD. As of the writing of this ROD, EPA has not been provided with work plans to review for any development work.

Comment 8: *A commenter asked about the differences between the schedule and time to conduct cleanup at the nearby Mercury Marine Plant No. 1 Superfund site.*

EPA Response: Cleaning up Superfund sites is a complex, multi-phase process, and cleanup time depends on site conditions and chemical characteristics. A key difference between the Amcast and the Mercury Marine Plant No. 1 sites is the presence of a viable responsible party to conduct and pay for the cleanup. The Amcast site is being cleaned up with federal government taxpayer funds, and as such there are additional steps that must be followed to

permit the use of federal funding for the cleanup. Following issuance of the ROD, EPA will conduct the remedial design. During the remedial design, EPA will request remedial action funding from EPA Headquarters for implementation of the selected remedy for OU1. Remedial action funding is provided by Headquarters on a site-specific basis, with priority given to sites posing the greatest risk. It is not possible to predict when such funding will be provided. EPA will continue to work toward implementing the cleanup at the Site in as timely of a manner as practicable. Individual aspects of the Site such as Hazard Ranking System score or specific constituents present at the Site generally do not impact broad timelines for cleanup implementation.

Comment 9: *A commenter voiced concerns about re-contamination of groundwater from neighboring site cleanups after groundwater contamination at the Amcast site is reduced.*

EPA Response: The groundwater remedy proposed in this ROD is an interim remedy, with the intention of better understanding groundwater quality beneath the Amcast Site after the selected remedy is implemented. As of the writing of this ROD, the most recent groundwater sampling was conducted in 2011, so it is difficult to determine at this time if there are other potential sources of groundwater contamination and how those could impact groundwater quality at the Amcast Site. After conducting the baseline monitoring described in this ROD, EPA will evaluate available data and coordinate with state and local entities as needed to address any potential off-site sources as appropriate, and factor surrounding site conditions into any final groundwater remedy that would be presented to the public in the future.

Comment 10: *What will be used to control dust and what will be used to quantify if those measures are effective during the cleanup process?*

EPA Response: Health and Safety Plans and work plans for remedy implementation from EPA contractors, which will be submitted to EPA for review prior to beginning the remedial action, will include provisions for dust monitoring and other environmental monitoring as appropriate to assess and control potential for dust migration, such as wet dust control, fencing, or other dust barriers.

Comment 11: *When electrical, energy or telecom contractors are performing service in these areas what standards exist to protect their employees and Cedarburg citizens from spread of contamination?*

EPA Response: EPA contractors are required to submit Health and Safety Plans and work plans for EPA review and approval that discuss environmental monitoring (including dust) during their work to ensure any contamination present does not spread to other areas as a result of windblown dust. Other contractors that may be working in the area and not under EPA oversight, such as electrical or telecommunications workers, would be subject to state and local environmental regulations under the oversight of those entities, and EPA does not promulgate requirements related to the work of those contractors. Any work performed by

any contractor at the Site must not interfere with Site remediation activities or adversely affect the Site.

Comment 12: *Will citizens be notified when work is to begin which may create dust?*

EPA Response: Yes. EPA will coordinate with the City of Cedarburg, as well as issue communications to the public throughout the remedial design and remedial action processes, to ensure the public is made aware of impacts to the area as construction is taking place and can plan accordingly. EPA's plan for community coordination and communication is discussed in the 2022 Community Involvement Plan, which is available on the EPA webpage for the Site.

Comment 13: *Could dust from prior years of industry and incomplete demolition of the site contaminate nearby soil?*

EPA Response: Yes. EPA conducted sampling in nearby residential yards that the CSM (as described in the 2015 RI Report) identified as potentially contaminated from overland stormwater flow from the Amcast North parcel, and factored known soil contamination data into the HHRA discussed in this ROD. Additional sampling is also proposed as part of the selected remedy for Amcast North to assess current conditions and determine if additional excavation will be needed.

Comment 14: *What evidence exists to show residential yards other than those listed in the proposal have not been impacted by contaminated dust?*

EPA Response: The CSM for the Site, described in detail in the 2015 RI Report, identifies overland stormwater flow as the primary mechanism by which contamination from Amcast North spread to the surrounding residential yards. The residential yards sampled are down-slope from Amcast North, and as such are the yards that receive overland stormwater flow from the Amcast North parcel. It is unlikely that residences in other directions, which are up-slope from Amcast North, would have received a significant stormwater flow from the parcel.

Comment 15: *A community member asked if contaminated groundwater could impact the sump pump at their home and bring contaminated groundwater to the surface.*

EPA Response: The groundwater monitoring proposed in this ROD is intended to better understand the nature and extent of groundwater contamination (if any) in the areas surrounding the Site. The main exposure pathway by which a sump pump would pose a risk to a resident in a home is vapor intrusion, which occurs when there is a migration of vapor-forming chemicals from any subsurface source into an overlying building, such as a home. Current groundwater data available to EPA does not indicate a significant risk posed by vapor intrusion to residences in the area. In the event contamination is found that would pose

an unacceptable risk to residents, via vapor intrusion or incidental contact with groundwater, EPA will notify residents and develop a remedy to address the risk.

Comment 16: *Is the pathway which runs around the northwest of Quarry Pond (the undeveloped path which runs between the pond and the rail tracks and passes the outdoor gym) safe for walking pets?*

EPA Response: EPA does not have data to suggest that any area within Zeunert Park, aside from the banks of Quarry Pond and Quarry Pond itself, contain contamination at unacceptable risk levels.

Comment 17: *Several commenters requested additional fencing and access restrictions at Amcast North and South to prevent public access.*

EPA Response: EPA has encouraged the current owner of Amcast North and South, as well as the City of Cedarburg, to control access to these parcels to prevent any unnecessary exposures to Site contamination. However, based on the data from the HHRA conducted by EPA, there is low potential of risk posed by site contamination to occasional trespassers or people who have otherwise limited contact with Site soils. The higher potential of risk being addressed in this ROD pertains to residential use of the Site, where people spend significantly more time in a contaminated area (*i.e.,* greater than 8 hours a day) and therefore have overall higher exposures to Site contamination than occasional trespassers who access the Site.

Comment 18: *A community member asked questions about the availability of soil testing for private yards and whether or not funding exists for these tests, additionally asking if there is risk from growing vegetables on their property.*

EPA Response: EPA is not aware of local services that provide for soil testing, but in general understands that universities with agricultural or horticultural extension programs may offer services for testing soil and determining its suitability for growing produce. EPA's Superfund program has conducted a RI to understand the migration pathways of contamination from the Amcast Site, and has sampled residential areas that were evidenced to have been contaminated from overland stormwater flow from the Amcast Site. EPA does not have evidence to suggest that residential properties elsewhere in Cedarburg are impacted by the Amcast Site and would therefore warrant testing.

Comment 19: *A community member asked EPA and other organizations involved to keep the citizens informed and that the proposals made by contractors not only include cost but also practicality, invasiveness, and ability to minimize the spread of contamination by air. The same community member asked those participating in the planning and cleanup to take the same care they would take if it were their own community that they were cleaning. The*

community member also asked the state and city government to make a stronger attempt to work as a team with EPA.

EPA Response: EPA has worked with the community prior to and during the RI and FS to ensure that interested parties are kept informed. This has been accomplished via website postings, direct mailings, community interviews, and newspaper notices.

EPA will continue to coordinate with the WDNR and the City of Cedarburg before conducting the work outlined in this ROD, and will provide updates to the community as progress is made in order to keep local residents informed on progress. EPA expects to work with the City of Cedarburg to distribute smaller-scale updates to the community but will also participate in further community involvement during the remedial process.

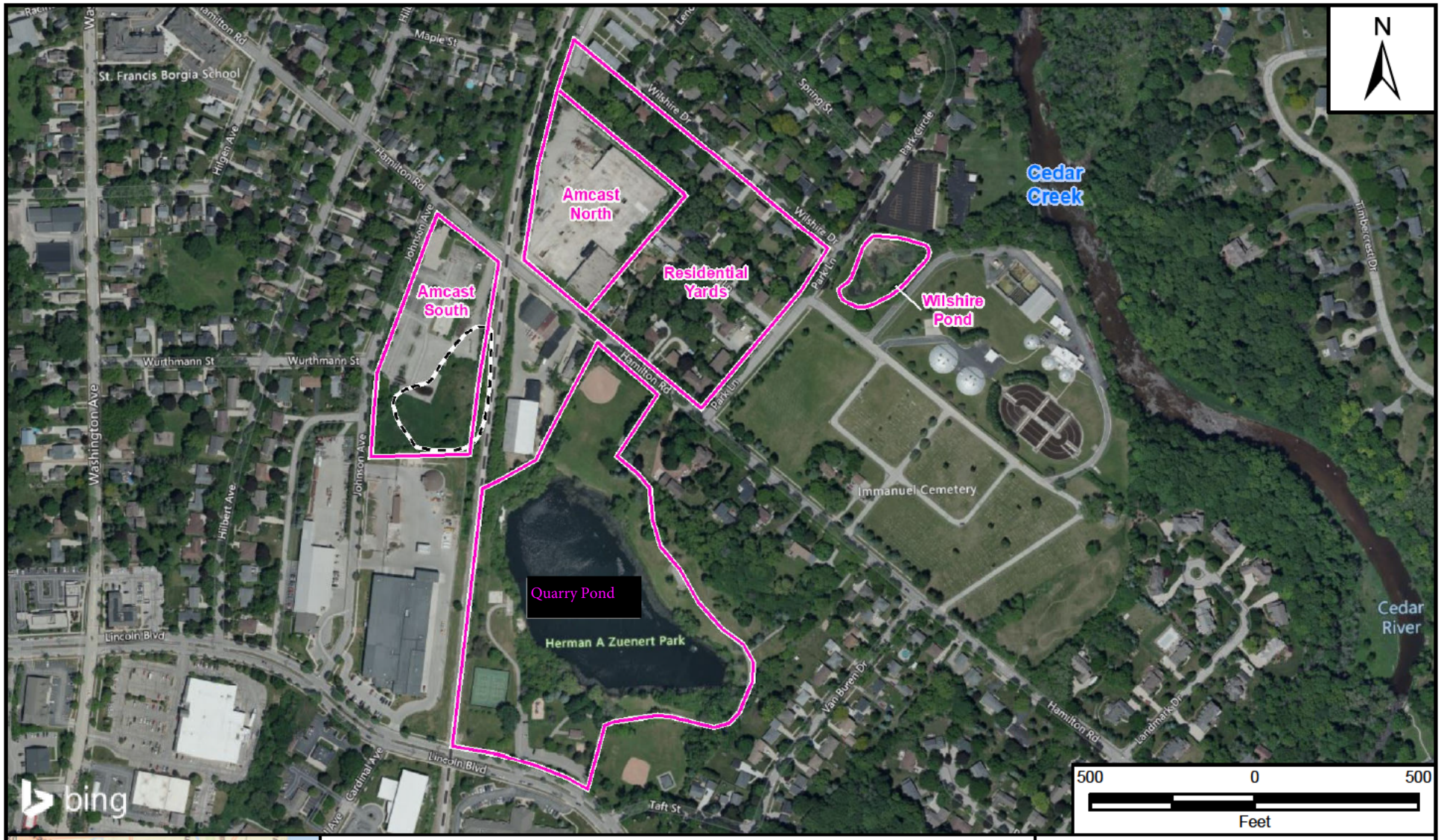
EPA intends to continue its outreach efforts to the community during the cleanup process. EPA used several information sources, including research and information received from community interviews, to develop a Community Involvement Plan, which EPA updated in December 2022. The CIP forms the basis for the identification of community involvement needs and the plans to address those needs. CIPs are updated as new information becomes available and as a site progresses through the assessment, characterization, cleanup, and post-construction phases of the Superfund process.

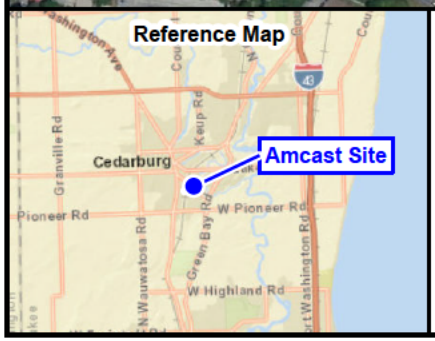
Comment 20: *A community member expressed concern with the newly exposed concrete slab at the Amcast North site which is documented to have absorbed oils containing high concentrations of PCBs from former industrial activities and does not appear to be addressed in the RI. PCB concentrations of up to 940 ug/100cm^2 have been detected as part of prior wipe sampling. A portion of the industrial building was recently demolished which has exposed the impacted concrete slab to natural erosional forces. The exposed slab is currently within 25 feet of residential properties and any erosion of this slab will continue to contaminate/expose adjacent residential yards and the occupants to PCB contaminated concrete dust.*

EPA Response: EPA appreciates the comment. EPA has re-evaluated the HHRA determinations regarding the Amcast North slab, and determined that additional testing will be needed to assess if the now exposed slab at Amcast North requires additional remediation. Alternative AMN-2 from the Proposed Plan has been modified in this ROD to include concrete slab testing and provisions for power washing or slab removal, pending concrete sampling results. Wipe samples, such as those referenced in the comment, are not typically used for determining human health risks in porous concrete, and as such concrete core samples will be collected to evaluate PCB contamination in the slab and EPA will remediate contamination that would pose an unacceptable risk for residential use.

ATTACHMENT 1

Figures





Legend

- Approximate Study Area
- Approximate Location of Former Disposal Area Based on Boring Logs and Historical Report Maps

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 1
Site Location Map

TETRA TECH

Prepared For: US EPA	Prepared By: Tetra Tech

File Path: G:\G\G9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig1-SiteLocationMap.mxd

Date Saved: 2/27/2023

EPA Contract No.: 68HE0519D0005

TO/TOLIN: 68HE0521F0114

Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
Projection: Lambert Conformal Conic
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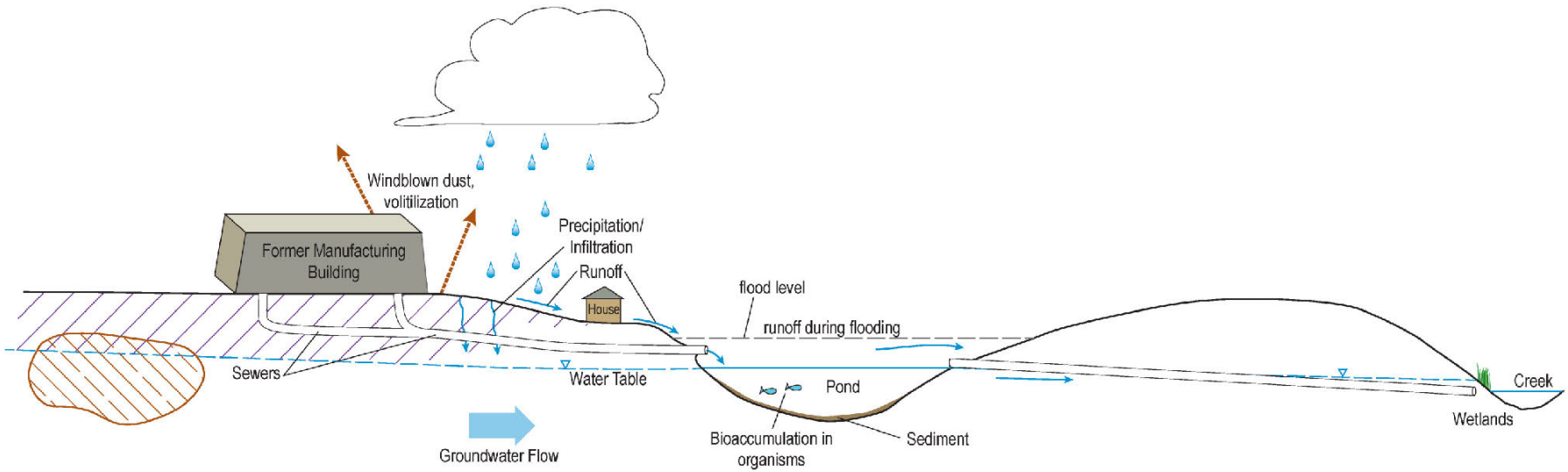
Units: Foot US



Not to scale

Contaminated soil

Contaminated Disposal Area

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 2
Conceptual Design - Release/ Transport Mechanisms

TETRA TECH

Prepared For: US EPA	Prepared By: Tetra Tech

File Path: G:\G\G9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig2-ConceptualDesign.mxd

Date Saved: 12/2/2022

EPA Contract No.: 68HE0519D0005

TO/TOLIN: 68HE0521F0114

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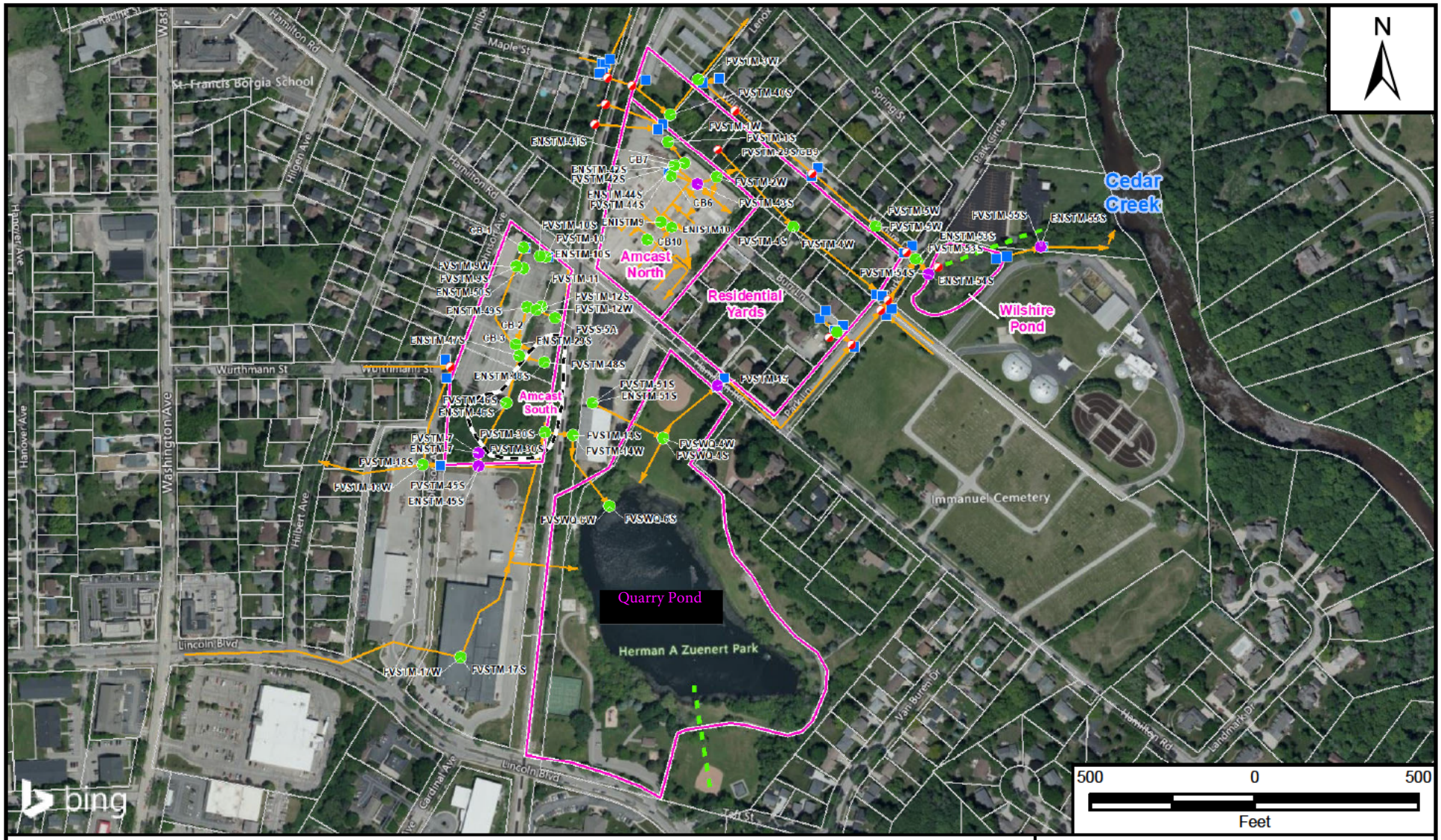

Legend

- Not Sampled
- Sample Collected
- Storm Sewer Access
- Catch Basin
- Approximate Study Area
- Approximate Location of Former Disposal Area Based on Boring Logs and Historical Report Maps
- Storm Sewer Line
- Former Storm Sewer Line
- Parcel

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 3
Storm Sewer Location Map

TETRA TECH

Prepared For: US EPA	Prepared By: Tetra Tech

File Path: G:\G\G9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig3-StormSewerLocations.mxd

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EPA Contract No.: 68HE0519D0005

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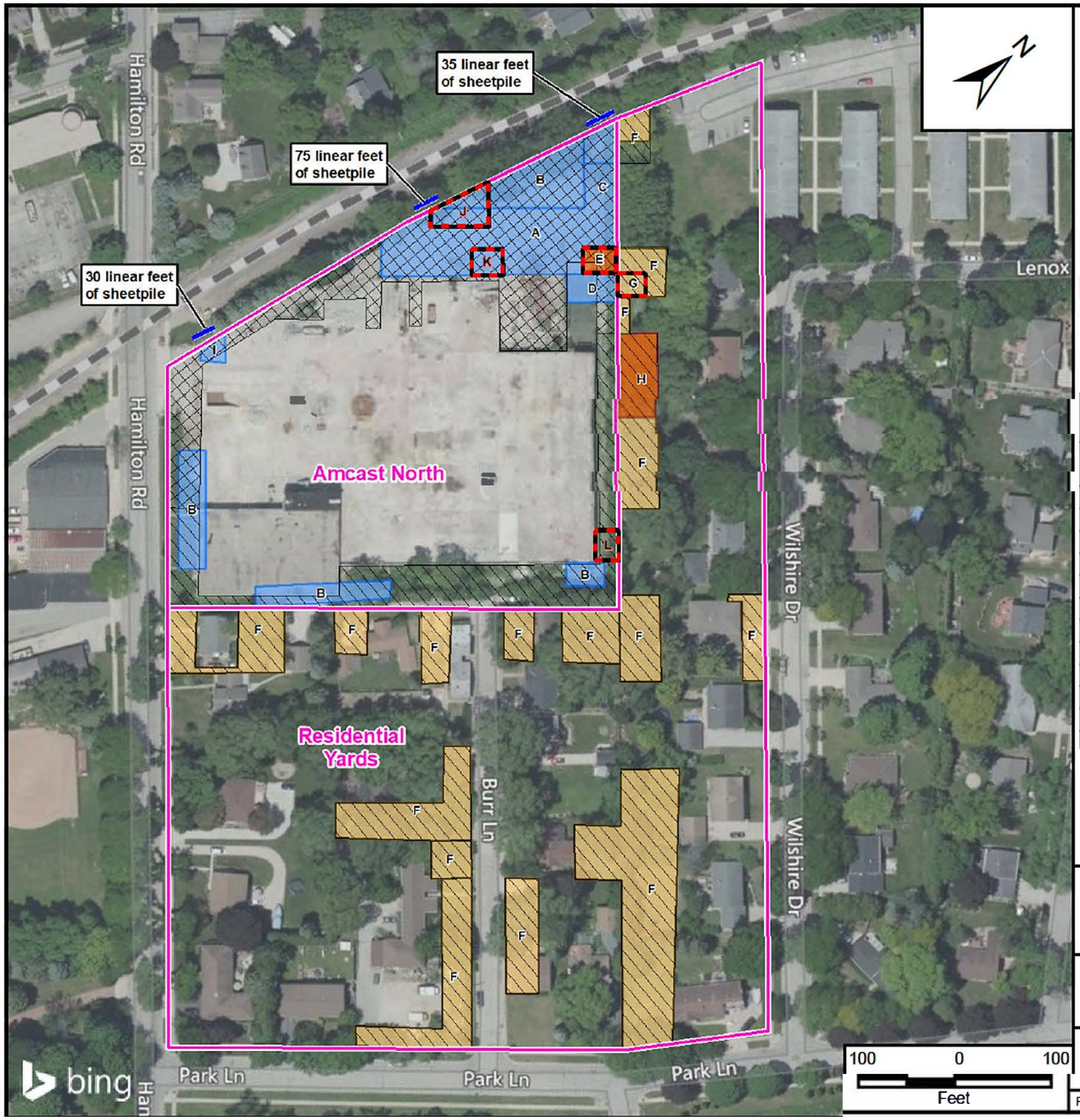

Legend

- Sheetpile Wall
- Cleaning/Grubbing
- Pavement Removal
- Industrial non-TSCA excavation (AMN-2) or isolation cover (AMN-3)
- Residential non-TSCA excavation (RY-2) or isolation cover (RY-3)
- TSCA excavatio
- Soil area exceeds TSCA high-occupancy use threshold/requires remedial action
- Approximate Study Are

Area/Type	Estimated Excavation Depths	Approximate Square Feet
Pavement Removal	N/A	43,947
Clearing/Grubbing	N/A	94,699
Area A	5 feet	17,100
Area B	2 feet	12,803
Area C	6 feet	3,600
Area D	4 feet	1,549
Area E	3 feet	500
Area F	2 feet	66,058
Area G	4 feet	1,300
Area H	2 feet	3,600
Area I	10 feet	600
Area J	5 feet	1,917
Area K	3 feet	887
Area L	3 feet	748

100 0 100
Feet

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 4
Amcast North Property/Residential Yards Alternatives

TETRA TECH

Prepared For: US EPA | Prepared By: Tetra Tech

File Path: 3:\G\G9031-START V\Wisconsin\Amcast\mxd\2023-03\Fig14-ResidentialYardsAlt-North.mxd

Date Saved: 3/3/2023

EPA Contract No.: 68HE0519D0005

TO/TOLIN: 68HE0521F0114

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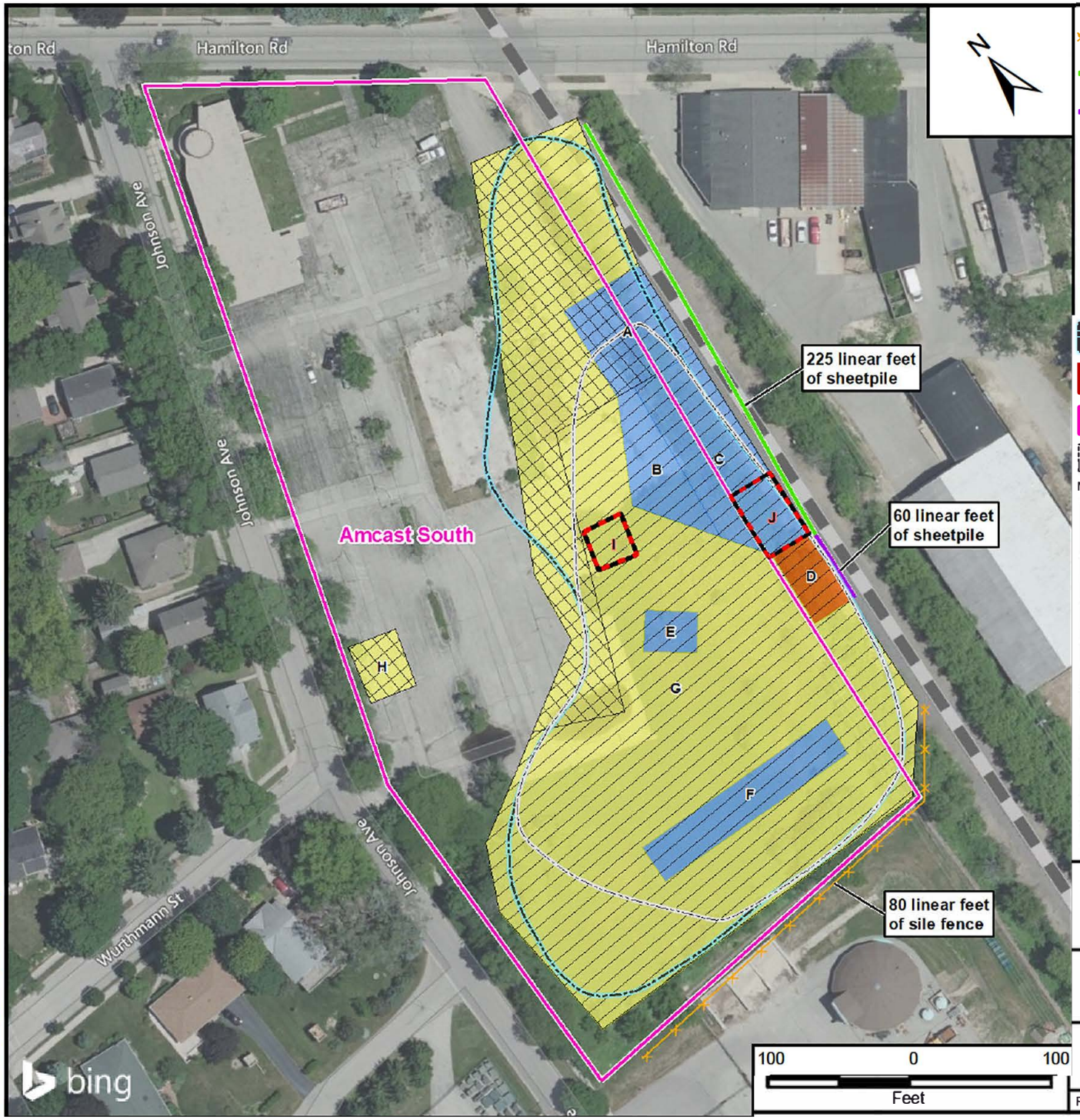

Silt Fence

Sheetpile Wall, AMS-2

Sheetpile Wall, AMS-3

Cleaning/Grubbing

Pavement Remova

AMS-2: Shallow (2-ft) non-TSCA Excavation Area

AMS-2: Excavation Areas > 2 f

TSCA Excavation Area

AMS-3: Isolation cover area

Soil area exceeds TSCA high-occupancy use threshold/requires remedial action

Approximate Study Area

Approximate Location of Former Disposal Area

Note: AMS-4 extents left off figure in error. Extents similar to AMS-2.

Area/Type	Estimated Excavation Depths	Approximate Square Feet
Pavement Removal	N/A	21,953
Clearing/Grubbing	N/A	86,219
AMS-3: Isolation cover area	N/A	100,273
Area A	6 feet	4,500
Area B	8 feet	3,100
Area C	11 feet	7,400
Area D	22 feet	1,700
Area E	4 feet	1,100
Area F	10 feet	4,500
Area G	2 feet	88,185
Area H	2 feet	1,500
Area I	13 feet	883
Area J	19 feet	1,660

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 5
Amcast South Alternatives

TETRA TECH

Prepared For: US EPA | Prepared By: Tetra Tech

File Path: J:\GIG\G9031-START V\Wisconsin\Amcast\mxd\2023-03\Fig15-Alternatives-South.mxd

Date Saved: 3/3/2023

EPA Contract No.: 68HE0519D0005

TO/TOLIN: 68HE0521F0114

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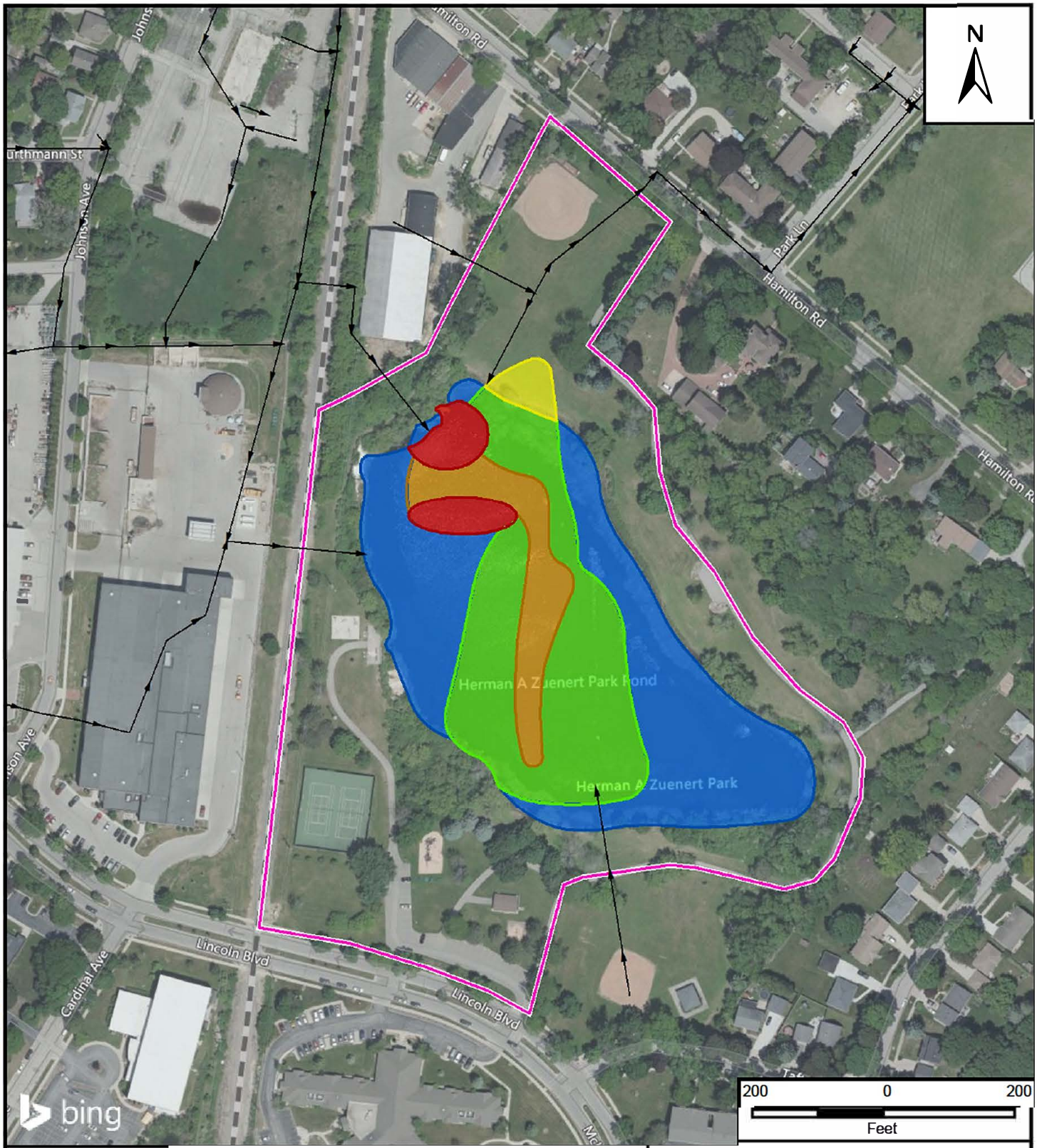

Storm Sewer Line

Approximate Extent of Quarry Pond

Sediment Exceeds Ecological PRG (3 feet)

Bank Soil Exceeds Ecological PRG (3 feet)

Sediment Exceeds Recreational PRG (2 feet)

TSCA Sediment (3-5 feet)

Sediment Removal to 1 mg/kg (1 feet)

Notes:
PRG = preliminary remediation goal for soil/sediment as outlined in the Feasibility Study Report text

Area/Type	Estimated Excavation Depths	Approximate Square Feet
Area A	2 feet	29,000
Area B	3 feet	93,000
Area C1	5 feet	7,991
Area C2	3 feet	7,309
Area D	3 feet	5,900
Area E	1 feet	126,000

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 6
Quarry Pond Alternatives

TETRA TECH

Prepared For: US EPA | Prepared By: Tetra Tech

File Path: J:\GVG9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig16-QuarryPondAlternatives.mxd

Date Saved: 1/3/2023

EPA Contract No.: 68HE051D00005

TO/TOLIN: 68HE0521F0114

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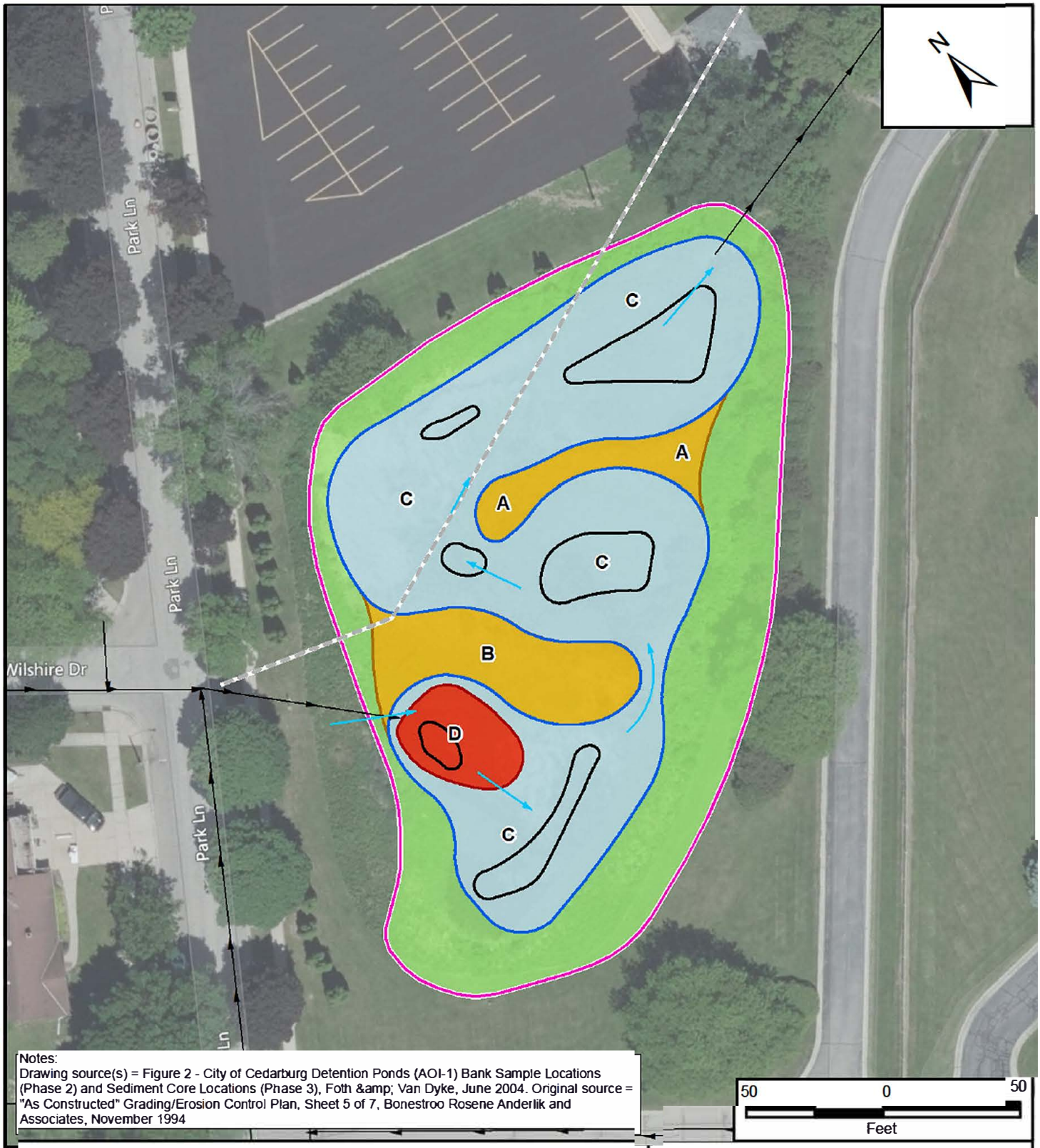

Notes:
Drawing source(s) = Figure 2 - City of Cedarburg Detention Ponds (AOI-1) Bank Sample Locations (Phase 2) and Sediment Core Locations (Phase 3), Foth & Van Dyke, June 2004. Original source = "As Constructed" Grading/Erosion Control Plan, Sheet 5 of 7, Bonestroo Rosene Anderlik and Associates, November 1994

50 0 50
Feet

Storm Sewer Line
Former Storm Sewer Line
Basin Toe of Slope
Top of Basin
Berm
Basin
TSCAArea
Approximate Extent of Wilshire Pond

Area/Type	Estimated Excavation Depths	Approximate Square Feet
Bank	NA	10200
Area A	2 feet	1,500
Area B	4 feet	2,700
Area C	2 feet	18,200
Area D	2 feet	1,200

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 7
Wilshire Pond Alternatives

TETRA TECH

Prepared For: US EPA
Prepared By: Tetra Tech

File Path: GG\G9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig17-WilshirePondAlternatives.mxd

Date Saved: 12/27/2022
EPA Contract No.: 68HE0519D0005
TO/TOLIN: 68HE0521F0114

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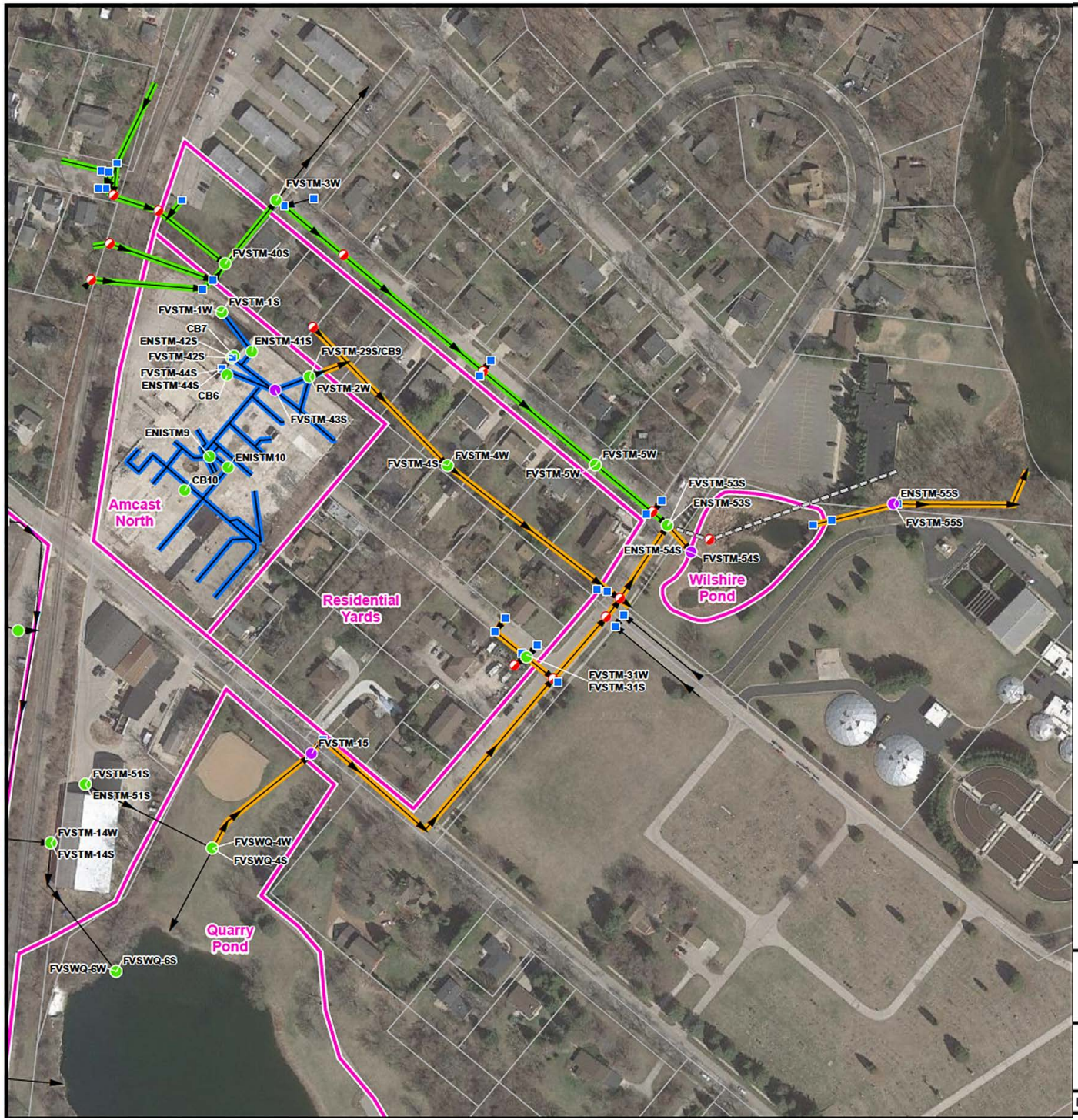

Legend

- Not Sampled
- Sample Collected
- Storm Sewer
- Catch Basin
- Approximate Study
- Storm Sewer Line
- Former Storm Sewer Line
- Downgradient pipes
- Onsite pipes outside of building footprint
- Onsite pipes within building footprint
- Upgradient/other pipes

N

200 0 200

Feet

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 8

Amcast North Storm Sewer Alternatives

TETRA TECH

Prepared For: US EPA | Prepared By: Tetra Tech

File Path: G:\IGG9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig18-AmcastNorthStormSewerAlternatives.mxd

Date Saved: 12/15/2022

EPA Contract No.: 68HE0519D0005

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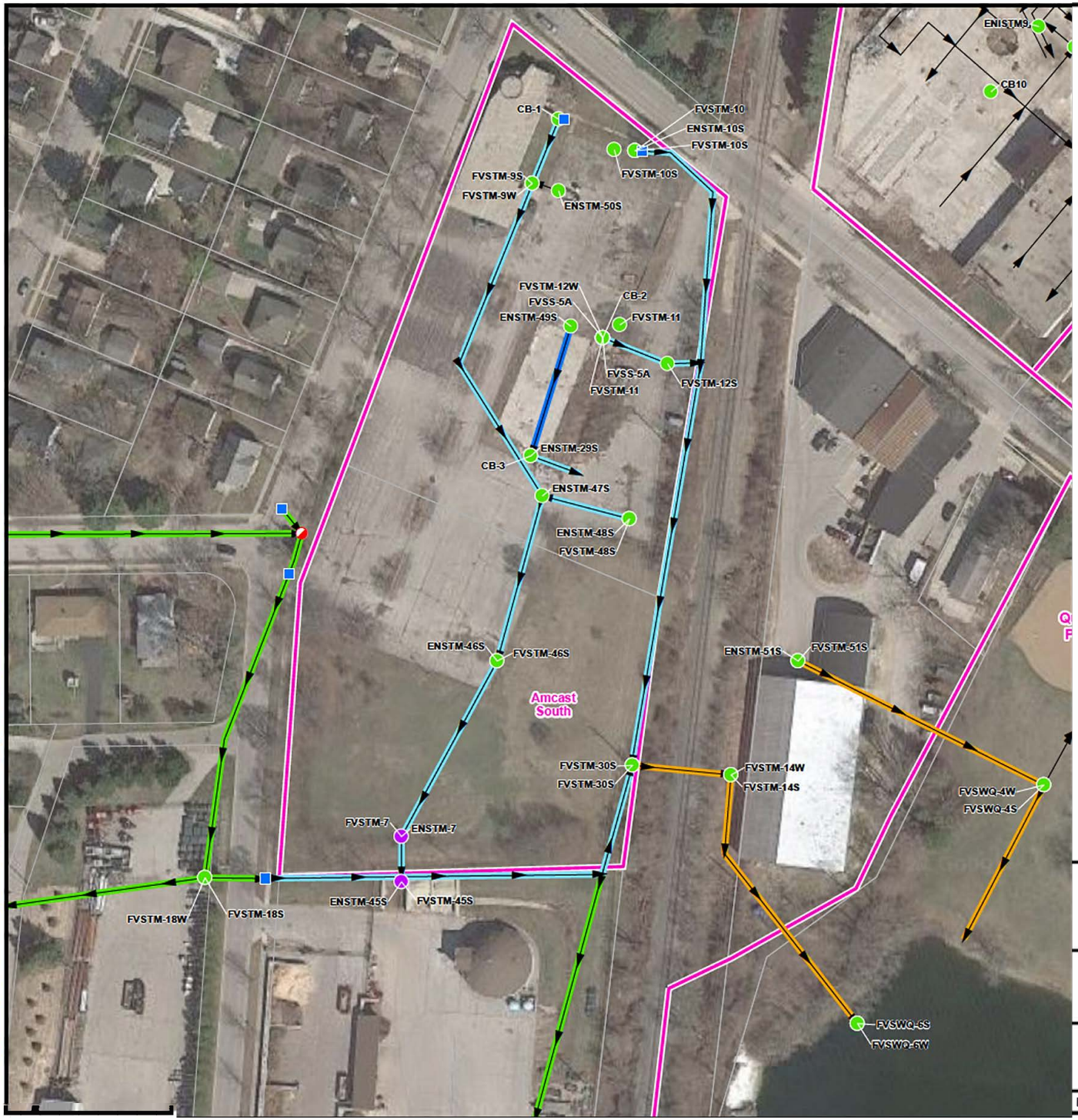

Legend

- Not Sampled
- Sample Collected
- Storm Sewer
- Catch Basin
- Approximate Study
- Storm Sewer Line
- Former Storm Sewer Line
- Downgradient pipes
- Onsite pipes outside of building footprint
- Onsite pipes within building footprint
- Upgradient/other pipes

N

100 0 100

Feet

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 9
Amcast South Storm Sewer Alternatives

TETRA TECH

Prepared For: US EPA | Prepared By: Tetra Tech

File Path: 3:\GG9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig19-AmcastSouthStormSewerAlternatives.mxd

Date Saved: 12/15/2022

EPA Contract No.: 68HE0519D0005

TO/TOLIN: 68HE0521F0114

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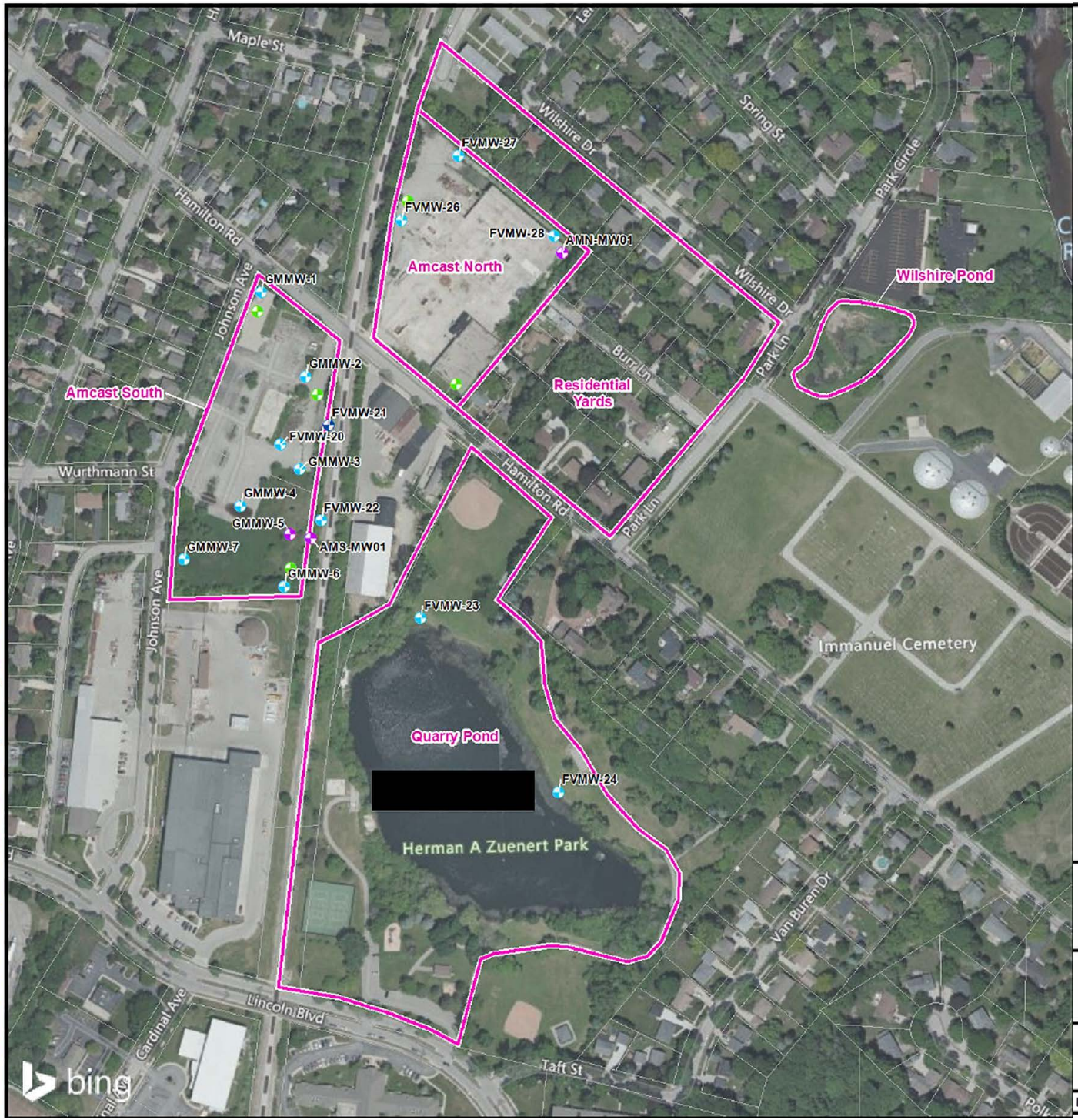

Legend

- New Deep Groundwater Monitoring Well
- Existing Shallow Groundwater Monitoring Well
- Existing Deep Groundwater Monitoring Well
- Monitoring Well To Be
- Approximate Study
- Parcel

N

300 0 300

Feet

Amcast Industrial Superfund Site
N39 W5789 Hamilton Road
Cedarburg, Ozaukee County, Wisconsin

Figure 10
Groundwater Monitoring Well Alternatives

TETRA TECH

Prepared For: US EPA | Prepared By: Tetra Tech

File Path: G:\GG9031-START V\Wisconsin\Amcast\mxd\2022-12\Fig20-GWM_Alternatives.mxd

Date Saved: 12/21/2022

EPA Contract No.: 68HE0519D0005

TO/TOLIN: 68HE0521F0114

Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US

ATTACHMENT 2

Tables

Table 1
Summary of Maximum Concentrations of Soil and Sediment Concentrations
Amcast Industrial Superfund Site, Cedarburg, Wisconsin

Class	Contaminant	Regulatory Enforceable Standards		Surface Soil (mg/kg)					Subsurface Soil (mg/kg)		Sediment (mg/kg)	
		Wisconsin NR700 Groundwater Protection Value[1]	Wisconsin NR700 Soil Direct Contact[2]	Amcast North	Residential Yards	Amcast South	Zeunert Park Pond Banks	Wilshire Pond Banks	Amcast North	Amcast South	Quarry Pond	Wilshire Pond
PCBs	PCBs	--	0 22	33	79	11	9	36	690	15000	11000	520
Metals	Arsenic	--	--	5 3	--	5 7	--	--	--	8 2	--	3 2
	Manganese	91 6	--	670	--	620	--	--	810	1200	--	--
	Lead	--	400	73 4	--	95	--	13	73 4	1200	--	--
	Copper	39 1	--	--	--	100	--	--	--	1600	--	--
PAHs	Total PAHs	--	--	5 09	--	62 86	--	--	50 8	2 92	--	--
	Benzo(a)anthracene	--	0 15	0 23	--	13	--	--	4 5	71	--	--
	Benzo(a)pyrene	0 47	0 015	0 3	--	8 1	--	--	3 7	80	--	--
	Benzo(b)fluoranthene	0 48	0 15	1 1	--	3 5	--	--	3 1	86	--	--
	Benzo(k)fluoranthene	--	0 15	--	--	7 2	--	--	3	58	--	--
	Chrysene	0 15	--	--	--		--	--	--	78	--	--
	Dibenzo(a,h)anthracene	--	0 015	0 086	--	1 2	--	--	0 92	14	--	--
	Indeno(1,2,3-cd)pyrene	--	0 15	0 56	--	7 5	--	--	3 4	78	--	--

Notes:

1	Obtained from WDNR's RCL spreadsheet and a Wisconsin dilution factor (DF) default value of 2
2	Calculated using Wisconsin NR720 12 guidance using toxicity factors used in the 2015 Human Health Risk Assessment, a hazard quotient of 1, and an excess lifetime cancer risk of $1x10^{-6}$
--	Not applicable or not detected
mg/kg	Milligrams per kilogram
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RCL	Residual contaminant levels
Surface Soil	0 to 2 feet below ground surface with ingestion, dermal contact, and inhalation assumed
Subsurface Soil	Total soil 0 to 10 feet below ground surface
WDNR	Wisconsin Department of Natural Resources

Table 2
Summary of Maximum Concentrations of Groundwater Contaminants
Amcast Industrial Superfund Site, Cedarburg, Wisconsin

Class	Contaminant	WDNR Groundwater Quality Enforcement Standards (µg/L)	EPA MCL (µg/L)	Human Health Risk-Based PRG (µg/L)	Sitewide Groundwater (µg/L)
PCBs	PCBs	0.03	--	--	1.7
Metals	Arsenic	10	10	--	89D/61
	Chromium	100	100	--	46D/370
	Manganese	300	--	--	1100
	Lead	15	15	--	80
PAHs	Benzo(a)anthracene	--	--	0.0016[a]	12
	Benzo(a)pyrene	0.2	0.2	--	19
	Benzo(b)fluoranthene	0.2	--	--	28
	Benzo(k)fluoranthene	--	--	0.0011[a]	24
	Chrysene	0.2	--	--	27
	Dibenzo(a,h)anthracene	--	--	0.00007[a]	0.02
	Indeno(1,2,3-cd)pyrene	--	--	0.00065[a]	21
Non-PAH SVOCs	bis(2-ethylhexyl)phthalate	--	6	--	730
	Hexachloroethane	--	--	3[b]	17
	Pentachlorophenol	1	1	--	0.18
VOCs	1,1'-biphenyl	--	--	0.3[b]	54
	1,2,4-trimethylbenzene	480	--	--	58
	Benzene	5	5	--	3.8
	Bromodichloromethane	0.6	80	--	1.4
	Chloroform	6	80	--	1.1
	Ethylbenzene	700	700	--	31
	Naphthalene	100	--	--	17

Notes:
µg/L - micrograms per liter
a - based on an excess lifetime cancer risk of 1E-06
b - based on a target organ hazard index of 1
PAH - Polycyclic aromatic hydrocarbon
PCB - Polychlorinated biphenyl
SVOC - Semi-volatile organic compound
VOC - Volatile organic compound
WDNR - Wisconsin Department of Natural Resources

TABLE 3.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet) (Trespasser)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Amcast North Surface Soil (0 - 2 ft)	7429-90-5	Aluminum	2.17E+03	J	1.18E+04	J	mg/kg	AMN-SO-05	9 / 9	-	1.18E+04	--	7.70E+03	nc	NA	NA	Yes	ASL
	7440-38-2	Arsenic	6.10E-01	J	5.30E+00		mg/kg	AMN-SO-09	18 / 18	4.30E-01 - 4.80E-01	5.30E+00	--	6.10E-01	ca	NA	NA	Yes	ASL
	7440-39-3	Barium	1.34E+01	J	2.63E+02	J	mg/kg	AMN-SO-05	9 / 9	-	2.63E+02	--	1.50E+03	nc	NA	NA	No	BSL
	7440-41-7	Beryllium	2.50E-01	J	3.40E-01	J	mg/kg	AMN-SO-09	3 / 9	-	3.40E-01	--	1.60E+01	nc	NA	NA	No	BSL
	7440-43-9	Cadmium	1.50E-01	J	6.60E-01		mg/kg	FVMW-27	13 / 17	3.80E-02 - 4.20E-02	6.60E-01	--	7.00E+00	nc	NA	NA	No	BSL
	7440-70-2	Calcium	1.95E+04	J	1.95E+05	J	mg/kg	AMN-SO-07	9 / 9	-	1.95E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	3.60E+00	J	3.04E+02		mg/kg	AMN-SO-01	18 / 18	3.20E-02 - 3.60E-02	3.04E+02	--	1.20E+04	nc	NA	NA	No	BSL
	7440-48-4	Cobalt	2.00E+00	J	6.20E+00		mg/kg	AMN-SO-05	7 / 9	-	6.20E+00	--	2.30E+00	nc	NA	NA	Yes	ASL
	7440-50-8	Copper	9.90E+00	J	1.14E+02	J	mg/kg	AMN-SO-05	9 / 9	-	1.14E+02	--	3.10E+02	nc	NA	NA	No	BSL
	7439-89-6	Iron	4.52E+03	J	1.76E+04	J	mg/kg	AMN-SO-05	9 / 9	-	1.76E+04	--	5.50E+03	nc	NA	NA	Yes	ASL
	7439-92-1	Lead	3.40E+00		7.34E+01		mg/kg	AMN-SO-05	18 / 18	3.10E-01 - 3.50E-01	7.34E+01	--	4.00E+02	nc	NA	NA	No	BSL
	7439-95-4	Magnesium	1.86E+04	J	1.04E+05	J	mg/kg	AMN-SO-07	9 / 9	-	1.04E+05	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	1.77E+02	J	6.68E+02		mg/kg	AMN-SO-02	9 / 9	-	6.68E+02	--	1.80E+02	nc	NA	NA	Yes	ASL
	7439-97-6	Mercury	7.00E-03		8.00E-02	J	mg/kg	AMN-SO-09	17 / 18	1.40E-03 - 1.60E-02	8.00E-02	--	2.30E+00	nc	NA	NA	No	BSL
	7440-02-0	Nickel	3.20E+00	J	2.06E+01		mg/kg	AMN-SO-01	9 / 9	-	2.06E+01	--	1.50E+02	nc	NA	NA	No	BSL
	7440-09-7	Potassium	2.62E+02	J	8.10E+02		mg/kg	AMN-SO-05	8 / 9	-	8.10E+02	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	3.56E+02	J	5.31E+02	J	mg/kg	AMN-SO-04	2 / 9	-	5.31E+02	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	6.80E+00	J	3.33E+01		mg/kg	AMN-SO-01	9 / 9	-	3.33E+01	--	3.90E+01	nc	NA	NA	No	BSL
	7440-66-6	Zinc	1.07E+01		2.21E+02		mg/kg	AMN-SO-05	9 / 9	-	2.21E+02	--	2.30E+03	nc	NA	NA	No	BSL
	53469-21-9	Aroclor-1242	7.50E-02		6.40E-01	J	mg/kg	B-2	3 / 23	1.30E-02 - 3.20E-02	6.40E-01	--	2.20E-01	ca	NA	NA	Yes	ASL
	12672-29-6	Aroclor-1248	2.70E-02	J	6.90E+02		mg/kg	FVMW-27	23 / 32	1.30E-02 - 6.00E+01	6.90E+02	--	2.20E-01	ca	NA	NA	Yes	ASL
	PCB	Total PCB (Calc)	2.70E-02	J	6.90E+02		mg/kg	FVMW-27	26 / 32	1.30E-02 - 6.00E+01	6.90E+02	--	1.10E-01	nc	NA	NA	Yes	ASL
	91-57-6	2-Methylnaphthalene	1.40E-03	J	3.50E-03	J	mg/kg	AMN-SO-05	3 / 9	-	3.50E-03	--	2.30E+01	nc	NA	NA	No	BSL
	106-44-5	4-Methylphenol	7.70E-03	J	7.70E-03	J	mg/kg	AMN-SO-09	1 / 9	-	7.70E-03	--	6.10E+02	nc	NA	NA	No	BSL
	100-02-7	4-Nitrophenol	6.60E-03	J	6.60E-03	J	mg/kg	AMN-SO-02	1 / 9	-	6.60E-03	--	4.80E+00	ca	NA	NA	No	BSL
	83-32-9	Acenaphthene	1.10E-03	J	6.30E-03	J	mg/kg	AMN-SO-09	3 / 9	-	6.30E-03	--	3.40E+02	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	4.50E-03		2.10E-01		mg/kg	AMN-SO-09	4 / 9	-	2.10E-01	--	3.40E+02	nc	NA	NA	No	BSL
	98-86-2	Acetophenone	8.70E-03	J	2.10E-02	J	mg/kg	AMN-SO-04	5 / 9	-	2.10E-02	--	7.80E+02	nc	NA	NA	No	BSL
	120-12-7	Anthracene	8.30E-04	J	7.30E-02		mg/kg	AMN-SO-09	7 / 9	-	7.30E-02	--	1.70E+03	nc	NA	NA	No	BSL
	100-52-7	Benzaldehyde	6.80E-03	J	6.80E-03	J	mg/kg	AMN-SO-05	1 / 9	-	6.80E-03	--	7.80E+02	nc	NA	NA	No	BSL
	56-55-3	Benzo(a)Anthracene	7.80E-04	J	2.30E-01		mg/kg	AMN-SO-09	9 / 10	3.90E-02 - 3.90E-02	2.30E-01	--	1.50E-01	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)Pyrene	7.70E-04	J	3.00E-01		mg/kg	AMN-SO-09	12 / 12	2.90E-02 - 3.00E-02	3.00E-01	--	1.50E-02	ca	NA	NA	Yes	ASL
	205-99-2	Benzo(b)Fluoranthene	2.20E-03	J	1.10E+00		mg/kg	AMN-SO-09	10 / 10	5.20E-02 - 5.20E-02	1.10E+00	--	1.50E-01	ca	NA	NA	Yes	ASL
	191-24-2	Benzo(g,h,i)Perylene	1.30E-03	J	2.10E-01		mg/kg	FVSS-19	9 / 10	6.00E-02 - 6.00E-02	2.10E-01	--	1.70E+02	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)Fluoranthene	5.40E-04	J	1.20E-01		mg/kg	AMN-SO-09	8 / 9	-	1.20E-01	--	1.50E+00	ca	NA	NA	No	BSL
	105-60-2	Caprolactam	6.80E-03	J	1.10E-02	J	mg/kg	MN-SO-03, AMN-SO-	4 / 9	-	1.10E-02	--	3.10E+03	nc	NA	NA	No	BSL
	86-74-8	Carbazole	5.50E-03	J	2.30E-02	J	mg/kg	AMN-SO-09	3 / 9	-	2.30E-02	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	1.90E-03	J	2.30E-01		mg/kg	AMN-SO-09	10 / 10	5.90E-02 - 5.90E-02	2.30E-01	--	1.50E+01	ca	NA	NA	No	BSL
	53-70-3	Dibenzo(a,h)Anthracene	6.90E-03	J	8.60E-02		mg/kg	AMN-SO-09	6 / 9	-	8.60E-02	--	1.50E-02	ca	NA	NA	Yes	ASL
	131-11-3	Dimethyl Phthalate	6.10E-03	J	9.30E-03	J	mg/kg	AMN-SO-01	3 / 9	-	9.30E-03	--	4.90E+03	nc	NA	NA	No	BSL
	84-74-2	Di-n-Butylphthalate	6.90E-03	J	1.40E-01		mg/kg	FVSS-16	7 / 11	4.50E-02 - 4.80E-02	1.40E-01	--	6.10E+02	nc	NA	NA	No	BSL
	117-84-0	Di-n-Octylphthalate	9.00E-02		9.00E-02		mg/kg	FVSS-18	1 / 10	5.70E-02 - 5.70E-02	9.00E-02	--	3.50E+01	ca	NA	NA	No	BSL
	206-44-0	Fluoranthene	1.30E-03	J	1.00E+00		mg/kg	AMN-SO-09	10 / 10	4.20E-02 - 4.20E-02	1.00E+00	--	2.30E+02	nc	NA	NA	No	BSL
	86-73-7	Fluorene	5.90E-04	J	8.10E-03	J	mg/kg	AMN-SO-09	4 / 9	-	8.10E-03	--	2.30E+02	nc	NA	NA	No	BSL
	193-39-5	Indeno(1,2,3-cd)Pyrene	9.60E-04	J	5.60E-01		mg/kg	AMN-SO-09	10 / 10	9.70E-02 - 9.70E-02	5.60E-01	--	1.50E-01	ca	NA	NA	Yes	ASL
	91-20-3	Naphthalene	1.80E-03	J	2.40E-02	B	mg/kg	AMN-SO-04	4 / 23	2.50E-02 - 2.50E-02	2.40E-02	--	3.60E+00	ca	NA	NA	No	BSL
	85-01-8	Phenanthrene	1.80E-03	J	3.90E-02		mg/kg	AMN-SO-05	6 / 9	-	3.90E-02	--	1.70E+03	nc	NA	NA	No	BSL
	108-95-2	Phenol	5.80E-03	J	1.10E-02	J	mg/kg	AMN-SO-09	3 / 9	-	1.10E-02	--	1.80E+03	nc	NA	NA	No	BSL

TABLE 3.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet) (Trespasser)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
	129-00-0	Pyrene	2.40E-03	J	1.00E+00		mg/kg	AMN-SO-09	10 / 10	5.60E-02 - 5.60E-02	1.00E+00	--	1.70E+02	nc	NA	NA	No	BSL
	78-93-3	2-Butanone	8.30E-03	J	8.30E-03	J	mg/kg	AMN-SO-04	1 / 9	-	8.30E-03	--	2.80E+03	nc	NA	NA	No	BSL
	67-64-1	Acetone	4.40E-03	J	1.30E-02		mg/kg	AMN-SO-04	3 / 9	-	1.30E-02	--	6.10E+03	nc	NA	NA	No	BSL
	67-66-3	Chloroform	5.70E-04	J	5.70E-04	J	mg/kg	AMN-SO-04	1 / 23	2.50E-02 - 2.50E-02	5.70E-04	--	2.90E-01	ca	NA	NA	No	BSL
	156-59-2	cis-1,2-Dichloroethene	5.10E-02	J	2.30E-01		mg/kg	B-2	2 / 23	2.50E-02 - 3.20E-02	2.30E-01	--	1.60E+01	nc	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.30E-04	J	2.10E-04	J	mg/kg	AMN-SO-04	2 / 23	5.00E-02 - 5.00E-02	2.10E-04	--	6.30E+01	nc	NA	NA	No	BSL
	108-88-3	Toluene	1.40E-04	J	3.80E-04	J	mg/kg	AMN-SO-04	4 / 23	2.50E-02 - 2.50E-02	3.80E-04	--	5.00E+02	nc	NA	NA	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for Bis(2-ethylhexyl)phthalate was used as the SL for Di-n-octylphthalate.
The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for Diethyl Phthalate was used as the SL for Dimethyl Phthalate.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Nitrobenzene was used as the SL for 4-Nitrophenol.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for Xylenes was used as the SL for m,p-Xylene.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes

Selection Reason:
- Above Screening Levels (ASL)

Deletion Reason:
- Below Screening Level (BSL)
- Essential Nutrient (NUT)
- No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
IEUBK = Integrated Exposure Uptake Biokinetic Model
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
B= Analyte is present in the method blank.

TABLE 3.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet) (Trespasser)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Amcast South Surface Soil (0 - 2 ft)	7429-90-5	Aluminum	3.04E+03	J	8.61E+03		mg/kg	AMS-SO-02	10 / 10	-	8.61E+03	--	7.70E+03	nc	NA	NA	Yes	ASL
	7440-38-2	Arsenic	1.20E+00		5.70E+00		mg/kg	FVSB-11	19 / 19	4.30E-01 - 4.80E-01	5.70E+00	--	6.10E-01	ca	NA	NA	Yes	ASL
	7440-39-3	Barium	2.42E+01		7.06E+01		mg/kg	AMS-SO-03	10 / 10	-	7.06E+01	--	1.50E+03	nc	NA	NA	No	BSL
	7440-41-7	Beryllium	2.00E-01	J	5.40E-01	J	mg/kg	AMS-SO-03	4 / 10	-	5.40E-01	--	1.60E+01	nc	NA	NA	No	BSL
	7440-43-9	Cadmium	1.40E-01	J	2.60E+01		mg/kg	FVSS-06	17 / 20	3.80E-02 - 2.00E-01	2.60E+01	--	7.00E+00	nc	NA	NA	Yes	ASL
	7440-70-2	Calcium	6.16E+04	J	1.67E+05	J	mg/kg	AMS-SO-05	10 / 10	-	1.67E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	4.60E+00		1.50E+02		mg/kg	FVSS-06	20 / 20	3.30E-02 - 1.70E-01	1.50E+02	--	1.20E+04	nc	NA	NA	No	BSL
	7440-48-4	Cobalt	1.60E+00	J	4.90E+00	J	mg/kg	AMS-SO-02	9 / 10	-	4.90E+00	--	2.30E+00	nc	NA	NA	Yes	ASL
	7440-50-8	Copper	1.01E+01		1.01E+03	J	mg/kg	AMS-SO-03	10 / 10	-	1.01E+03	--	3.10E+02	nc	NA	NA	Yes	ASL
	7439-89-6	Iron	5.34E+03	J	1.72E+04	J	mg/kg	AMS-SO-02	10 / 10	-	1.72E+04	--	5.50E+03	nc	NA	NA	Yes	ASL
	7439-92-1	Lead	6.90E+00		1.20E+03		mg/kg	FVSS-06	20 / 20	3.20E-01 - 1.70E+00	1.20E+03	--	4.00E+02	nc	NA	NA	Yes	ASL
	7439-95-4	Magnesium	3.64E+04	J	8.98E+04	J	mg/kg	AMS-SO-04	10 / 10	-	8.98E+04	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	3.28E+02	J	6.24E+02	J	mg/kg	AMS-SO-05	10 / 10	-	6.24E+02	--	1.80E+02	nc	NA	NA	Yes	ASL
	7439-97-6	Mercury	1.60E-02		6.70E-01		mg/kg	FVSS-06	13 / 20	1.50E-03 - 3.10E-03	6.70E-01	--	2.30E+00	nc	NA	NA	No	BSL
	7440-02-0	Nickel	4.30E+00		2.94E+01		mg/kg	AMS-SO-03	10 / 10	-	2.94E+01	--	1.50E+02	nc	NA	NA	No	BSL
	7440-09-7	Potassium	3.20E+02	J	6.68E+02	J	mg/kg	AMS-SO-06	3 / 10	-	6.68E+02	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	1.08E+03		1.08E+03		mg/kg	AMS-SO-02	1 / 10	-	1.08E+03	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	1.06E+01		3.33E+01		mg/kg	AMS-SO-02	10 / 10	-	3.33E+01	--	3.90E+01	nc	NA	NA	No	BSL
	7440-66-6	Zinc	3.26E+01		7.16E+01		mg/kg	AMS-SO-03	10 / 10	-	7.16E+01	--	2.30E+03	nc	NA	NA	No	BSL
	12672-29-6	Aroclor-1248	4.00E-02		1.10E+01	J	mg/kg	AMS-SO-05	12 / 15	2.30E-02 - 1.30E-01	1.10E+01	--	2.20E-01	ca	NA	NA	Yes	ASL
	11097-69-1	Aroclor-1254	6.10E-01		6.10E-01		mg/kg	AMS-SO-01	1 / 10	-	6.10E-01	--	1.10E-01	nc	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	4.00E-02		1.10E+01	J	mg/kg	AMS-SO-05	13 / 15	2.30E-02 - 1.30E-01	1.10E+01	--	1.10E-01	nc	NA	NA	Yes	ASL
	92-52-4	1,1'-Biphenyl	1.60E-01	J	1.60E-01	J	mg/kg	AMS-SO-10	1 / 10	-	1.60E-01	--	5.10E+00	nc	NA	NA	No	BSL
	91-57-6	2-Methylnaphthalene	5.30E-03	J	6.40E-01		mg/kg	AMS-SO-10	5 / 10	-	6.40E-01	--	2.30E+01	nc	NA	NA	No	BSL
	83-32-9	Acenaphthene	2.30E-03	J	1.20E+00		mg/kg	FVSB-11	5 / 11	4.10E-01 - 4.10E-01	1.20E+00	--	3.40E+02	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	3.50E-03	J	1.20E+00		mg/kg	AMS-SO-06	5 / 10	-	1.20E+00	--	3.40E+02	nc	NA	NA	No	BSL
	98-86-2	Acetophenone	9.30E-03	J	1.00E-02	J	mg/kg	AMS-SO-02	2 / 10	-	1.00E-02	--	7.80E+02	nc	NA	NA	No	BSL
	120-12-7	Anthracene	1.40E-02	J	6.80E+00		mg/kg	FVSB-11	12 / 13	2.50E-02 - 2.60E-01	6.80E+00	--	1.70E+03	nc	NA	NA	No	BSL
	100-52-7	Benzaldehyde	9.80E-03	J	9.80E-03	J	mg/kg	AMS-SO-08	1 / 10	-	9.80E-03	--	7.80E+02	nc	NA	NA	No	BSL
	56-55-3	Benzo(a)anthracene	5.10E-02	J	1.30E+01		mg/kg	FVSB-11	15 / 16	3.50E-02 - 3.60E-01	1.30E+01	--	1.50E-01	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)pyrene	5.20E-02	J	1.00E+01		mg/kg	FVSB-11	15 / 16	2.70E-02 - 2.80E-01	1.00E+01	--	1.50E-02	ca	NA	NA	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	3.10E-03	J	8.60E+00		mg/kg	FVSB-11	16 / 16	4.80E-02 - 4.90E-01	8.60E+00	--	1.50E-01	ca	NA	NA	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	1.50E-02	J	5.90E+00		mg/kg	FVSB-11	14 / 15	5.30E-02 - 5.50E-01	5.90E+00	--	1.70E+02	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)fluoranthene	3.30E-02		9.40E+00		mg/kg	FVSB-11	14 / 15	7.20E-02 - 7.50E-01	9.40E+00	--	1.50E+00	ca	NA	NA	Yes	ASL
	85-68-7	Benzyl Butyl Phthalate	2.40E-01		2.40E-01		mg/kg	FVMW-22	1 / 11	4.90E-02 - 4.90E-02	2.40E-01	--	2.60E+02	ca	NA	NA	No	BSL
	105-60-2	Caprolactam	8.90E-03	J	2.80E-02	J	mg/kg	AMS-SO-02	3 / 10	-	2.80E-02	--	3.10E+03	nc	NA	NA	No	BSL
	86-74-8	Carbazole	6.50E-03	J	8.60E-01	J	mg/kg	AMS-SO-10	6 / 11	4.20E-01 - 4.20E-01	8.60E-01	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	1.80E-03	J	1.30E+01		mg/kg	FVSB-11	16 / 16	5.40E-02 - 5.50E-01	1.30E+01	--	1.50E+01	ca	NA	NA	No	BSL
	53-70-3	Dibenzo(a,h)anthracene	1.10E-02		2.30E+00		mg/kg	FVSB-11	11 / 12	4.10E-02 - 3.80E-01	2.30E+00	--	1.50E-02	ca	NA	NA	Yes	ASL
	132-64-9	Dibenzofuran	1.80E-02	J	1.10E+00		mg/kg	AMS-SO-10	4 / 11	4.70E-01 - 4.70E-01	1.10E+00	--	7.80E+00	nc	NA	NA	No	BSL
	84-66-2	Diethyl Phthalate	4.30E-02	J	4.30E-02	J	mg/kg	AMS-SO-05	1 / 10	-	4.30E-02	--	4.90E+03	nc	NA	NA	No	BSL
	131-11-3	Dimethyl Phthalate	6.00E-03	J	2.00E-02	J	mg/kg	AMS-SO-02	3 / 10	-	2.00E-02	--	4.90E+03	nc	NA	NA	No	BSL
	84-74-2	Di-n-butylphthalate	9.40E-03	J	1.60E+00	J	mg/kg	AMS-SO-01	6 / 12	4.70E-02 - 5.00E-02	1.60E+00	--	6.10E+02	nc	NA	NA	No	BSL
	206-44-0	Fluoranthene	2.40E-03	J	2.90E+01		mg/kg	FVSB-11	17 / 17	3.80E-02 - 4.00E-01	2.90E+01	--	2.30E+02	nc	NA	NA	No	BSL
	86-73-7	Fluorene	2.40E-03	J	1.90E+00		mg/kg	FVSB-11	6 / 11	4.40E-01 - 4.40E-01	1.90E+00	--	2.30E+02	nc	NA	NA	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-03	J	7.50E+00		mg/kg	FVSB-11	14 / 14	8.60E-02 - 8.90E-01	7.50E+00	--	1.50E-01	ca	NA	NA	Yes	ASL
	91-20-3	Naphthalene	2.10E-03	J	2.30E+00	J	mg/kg	AMS-SO-10	4 / 11	2.70E-02 - 2.70E-02	2.30E+00	--	3.60E+00	ca	NA	NA	No	BSL
	87-86-5	Pentachlorophenol	2.40E-02	J	2.40E-02	J	mg/kg	AMS-SO-03	1 / 9	-	2.40E-02	--	8.90E-01	ca	NA	NA	No	BSL

TABLE 3.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet) (Trespasser)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Min Qual	Maximum Concentration	Max Qual	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
	85-01-8	Phenanthrene	4.50E-03	J	1.80E+01		mg/kg	FVSB-11	16 / 16	4.40E-02 - 4.60E-01	1.80E+01	--	1.70E+03	nc	NA	NA	No	BSL
	108-95-2	Phenol	5.70E-03	J	3.70E-02	J	mg/kg	AMS-SO-05	2 / 10	-	3.70E-02	--	1.80E+03	nc	NA	NA	No	BSL
	129-00-0	Pyrene	2.90E-03	J	2.90E+01		mg/kg	FVSB-11	17 / 17	5.10E-02 - 5.20E-01	2.90E+01	--	1.70E+02	nc	NA	NA	No	BSL
	67-64-1	Acetone	3.70E-03	J	3.70E-03	J	mg/kg	AMS-SO-06	1 / 10	-	3.70E-03	--	6.10E+03	nc	NA	NA	No	BSL
	67-66-3	Chloroform	6.40E-04	J	3.40E-03	J	mg/kg	AMS-SO-06	3 / 10	-	3.40E-03	--	2.90E-01	ca	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.40E-04	J	1.40E-04	J	mg/kg	AMS-SO-08	1 / 10	-	1.40E-04	--	6.30E+01	nc	NA	NA	No	BSL
	108-88-3	Toluene	1.80E-04	J	3.80E-04	J	mg/kg	AMS-SO-01	6 / 10	-	3.80E-04	--	5.00E+02	nc	NA	NA	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for Diethyl Phthalate was used as the SL for Dimethyl Phthalate.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for Xylenes was used as the SL for m,p-Xylene.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes

Selection Reason:
- Above Screening Levels (ASL)

Deletion Reason:
- Below Screening Level (BSL)
- Essential Nutrient (NUT)
- No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
IEUBK = Integrated Exposure Uptake Biokinetic Model
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.

TABLE 3.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet) (Recreational User)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Wilshire Pond Bank Surface Soil (0 - 2 ft)	7440-38-2	Arsenic	3.20E+00	3.20E+00	mg/kg	FVSS-28	1 / 1	4.80E-01 - 4.80E-01	3.20E+00	--	6.10E-01	ca	NA	NA	Yes	ASL
	7440-43-9	Cadmium	3.20E-01	3.20E-01	mg/kg	FVSS-28	1 / 1	4.30E-02 - 4.30E-02	3.20E-01	--	7.00E+00	nc	NA	NA	No	BSL
	7440-47-3	Chromium	8.60E+00	8.60E+00	mg/kg	FVSS-28	1 / 1	3.70E-02 - 3.70E-02	8.60E+00	--	1.20E+04	nc	NA	NA	No	BSL
	7439-92-1	Lead	1.30E+01	1.30E+01	mg/kg	FVSS-28	1 / 1	3.60E-01 - 3.60E-01	1.30E+01	--	4.00E+02	nc	NA	NA	No	BSL
	7439-97-6	Mercury	2.70E-02	2.70E-02	mg/kg	FVSS-28	1 / 1	1.60E-03 - 1.60E-03	2.70E-02	--	2.30E+00	nc	NA	NA	No	BSL
	12672-29-6	Aroclor-1248	5.00E+01	5.20E+02	mg/kg	FVSS-33	3 / 3	3.00E+00 - 3.90E+01	5.20E+02	--	2.20E-01	ca	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	1.30E+00	5.20E+02	mg/kg	FVSS-33	12 / 12	3.00E+00 - 3.90E+01	5.20E+02	--	1.10E-01	nc	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes — Selection Reason: Above Screening Levels (ASL); Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient

TABLE 3.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet) (Recreational User)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Min Qual	Maximum Concentration	Max Qual	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Zeunert Park Surface Soil (0 - 2 ft)	12672-29-6	Aroclor-1248	1.60E-02	J	4.10E+00	D	mg/kg	AMQ-SD-02	13 / 26	-	4.10E+00	--	2.20E-01	ca	NA	NA	Yes	ASL
	11096-82-5	Aroclor-1260	9.80E-02	J	2.70E-01	J	mg/kg	AMZ-SO-05	2 / 26	-	2.70E-01	--	2.20E-01	ca	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	1.60E-02	J	9.00E+00		mg/kg	ENBS-5C	28 / 47	-	9.00E+00	--	1.10E-01	nc	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
HQ = Hazard Quotient
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
D = Diluted analysis.
SL = Screening Level

TABLE 3.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water (Recreational User)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value (3)	Potential ARAR/TBC Source (3)	COPC Flag	Rationale for Selection or Deletion (4)
Quarry Pond Surface Water	7429-90-5	Aluminum	2.90E+01		3.24E+01		ug/L	AMQ-SW02/01	5 / 5	-	3.24E+01	--	1.60E+03	nc	4.00E+01	PAL	No	BSL
	7440-38-2	Arsenic	5.50E-01	J	7.30E-01	J	ug/L	AMQ-SW02/01	5 / 5	-	7.30E-01	--	4.50E-02	ca	1.00E+00	PAL	Yes	ASL (RSL)
	7440-39-3	Barium	2.21E+01		2.96E+01		ug/L	AMQ-SW05/01	5 / 5	-	2.96E+01	--	2.90E+02	nc	4.00E+02	PAL	No	BSL
	7440-70-2	Calcium	2.52E+04		2.73E+04		ug/L	AMQ-SW03/01	5 / 5	-	2.73E+04	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	1.00E+00	J	1.10E+00	J	ug/L	AMQ-SW01/01, AMQ-SW02/01, AMQ-SW03/01, AMQ-SW05/01	5 / 5	-	1.10E+00	--	3.10E-02	ca	1.00E+01	PAL	Yes	ASL (RSL)
	7440-50-8	Copper	1.60E+00	J	2.60E+00		ug/L	AMQ-SW03/01	5 / 5	-	2.60E+00	--	6.20E+01	nc	1.30E+02	PAL	No	BSL
	7439-92-1	Lead	9.30E-01	J	9.30E-01	J	ug/L	AMQ-SW04/01	1 / 5	-	9.30E-01	--	1.50E+01	AL	1.50E+00	PAL	No	BSL
	7439-95-4	Magnesium	9.44E+03		1.02E+04		ug/L	AMQ-SW03/01	5 / 5	-	1.02E+04	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	1.16E+01		1.81E+01		ug/L	AMQ-SW03/01	5 / 5	-	1.81E+01	--	3.20E+01	nc	6.00E+01	PAL	No	BSL
	7439-97-6	Mercury	1.70E-01	J	1.80E-01	J	ug/L	AMQ-SW02/01, AMQ-SW03/01, AMQ-SW04/01	5 / 5	-	1.80E-01	--	4.30E-01	nc	2.00E-01	PAL	No	BSL
	7440-02-0	Nickel	4.70E-01	J	5.40E-01	J	ug/L	AMQ-SW03/01	5 / 5	-	5.40E-01	--	3.00E+01	nc	2.00E+01	PAL	No	BSL
	7440-09-7	Potassium	2.30E+03	J	3.07E+03	J	ug/L	AMQ-SW03/01	5 / 5	-	3.07E+03	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	1.45E+05		1.55E+05		ug/L	AMQ-SW03/01	5 / 5	-	1.55E+05	--	NUT	-	NA	NA	No	NUT
	7440-66-6	Zinc	4.00E+00		8.10E+00		ug/L	AMQ-SW03/01	5 / 5	-	8.10E+00	--	4.70E+02	nc	NA	NA	No	BSL
	205-99-2	Benzo(b)fluoranthene	1.00E-02	J	2.00E-02	J	ug/L	AMQ-SW04/01	3 / 5	-	2.00E-02	--	2.90E-02	ca	2.00E-02	PAL	No	BSL
	218-01-9	Chrysene	1.00E-02	J	2.00E-02	J	ug/L	AMQ-SW01/01, AMQ-SW04/01	5 / 5	-	2.00E-02	--	2.90E+00	ca	2.00E-02	PAL	No	BSL
	206-44-0	Fluoranthene	4.00E-02	J	5.00E-02	J	ug/L	AMQ-SW04/01	5 / 5	-	5.00E-02	--	6.30E+01	nc	8.00E+01	PAL	No	BSL
	86-73-7	Fluorene	1.00E-02	J	1.00E-02	J	ug/L	AMQ-SW01/01	1 / 5	-	1.00E-02	--	2.20E+01	nc	8.00E+01	PAL	No	BSL
	87-86-5	Pentachlorophenol	1.00E+00	J	3.10E+00	J	ug/L	AMQ-SW01/01	5 / 5	-	3.10E+00	--	3.50E-02	ca	1.00E-01	PAL	Yes	ASL (both)
	129-00-0	Pyrene	2.00E-02	J	2.00E-02	J	ug/L	AMQ-SW01/01, AMQ-SW02/01, AMQ-SW03/01, AMQ-SW04/01, AMQ-SW05/01	5 / 5	-	2.00E-02	--	8.70E+00	nc	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.90E-01	J	2.20E-01	J	ug/L	AMQ-SW03/01	2 / 5	-	2.20E-01	--	1.90E+01	nc	4.00E+02	PAL	No	BSL
	95-47-6	o-Xylene	1.10E-01	J	1.10E-01	J	ug/L	AMQ-SW03/01	1 / 5	-	1.10E-01	--	1.90E+01	nc	4.00E+02	PAL	No	BSL
	108-88-3	Toluene	1.90E-01	J	2.70E-01	J	ug/L	AMQ-SW01/01	2 / 5	-	2.70E-01	--	8.60E+01	nc	1.60E+02	PAL	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Tap Water (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

(3) Table 1 - Public Health Groundwater Quality Standards - Preventive Action Limit (PAL) - NR 140.10

The SL for 'Chromium(VI)' was used as the SL for Chromium.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Xylenes was used as the SL for m,p-Xylene.

(4) Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: -Both - Exceeds the RSL and PAL
-or RSL - Exceeds the RSL, PAL - Exceeds the AL
Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.

TABLE 3.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water (Recreational User)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Min Qual	Maximum Concentration	Max Qual	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value (3)	Potential ARAR/TBC Source (3)	COPC Flag	Rationale for Selection or Deletion (4)
Wilshire Pond Surface Water	7429-90-5	Aluminum	1.97E+01	J	2.12E+02		ug/L	AMW-SW-02/01	5 / 5	-	2.12E+02	--	1.60E+03	nc	4.00E+01	PAL	Yes	ASL (PAL)
	7440-36-0	Antimony	1.30E+00	J	1.30E+00	J	ug/L	AMW-SW-02/01	1 / 5	-	1.30E+00	--	6.00E-01	nc	1.20E+00	PAL	Yes	ASL (both)
	7440-38-2	Arsenic	6.80E-01	J	2.50E+00		ug/L	AMW-SW-05/01	5 / 5	-	2.50E+00	--	4.50E-02	ca	1.00E+00	PAL	Yes	ASL (both)
	7440-39-3	Barium	2.59E+01		1.12E+02		ug/L	AMW-SW-02/01	5 / 5	-	1.12E+02	--	2.90E+02	nc	4.00E+02	PAL	No	BSL
	7440-70-2	Calcium	3.43E+04		5.96E+04		ug/L	AMW-SW-04/01	5 / 5	-	5.96E+04	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	2.30E+00		1.02E+01		ug/L	AMW-SW-02/01	5 / 5	-	1.02E+01	--	3.10E-02	ca	1.00E+01	PAL	Yes	ASL (both)
	7440-48-4	Cobalt	4.40E-01	J	1.20E+00		ug/L	AMW-SW-02/01	3 / 5	-	1.20E+00	--	4.70E-01	nc	8.00E+00	PAL	Yes	ASL (RSL)
	7440-50-8	Copper	3.20E+00		8.80E+00	J,+	ug/L	AMW-SW-02/01	2 / 5	-	8.80E+00	--	6.20E+01	nc	1.30E+02	PAL	No	BSL
	7439-89-6	Iron	2.44E+02		1.64E+03		ug/L	AMW-SW-05/01	5 / 5	-	1.64E+03	--	1.10E+03	nc	NA	NA	Yes	ASL (RSL)
	7439-92-1	Lead	4.40E-01	J	1.10E+00		ug/L	AMW-SW-05/01	5 / 5	-	1.10E+00	--	1.50E+01	AL	1.50E+00	PAL	No	BSL
	7439-95-4	Magnesium	1.36E+04		3.84E+04		ug/L	AMW-SW-02/01	5 / 5	-	3.84E+04	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	1.04E+01		3.03E+02		ug/L	AMW-SW-02/01	5 / 5	-	3.03E+02	--	3.20E+01	nc	6.00E+01	PAL	Yes	ASL (both)
	7440-02-0	Nickel	8.20E-01	J	6.60E+00		ug/L	AMW-SW-02/01	5 / 5	-	6.60E+00	--	3.00E+01	nc	2.00E+01	PAL	No	BSL
	7440-09-7	Potassium	1.93E+03	J	8.84E+03		ug/L	AMW-SW-02/01	5 / 5	-	8.84E+03	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	1.16E+04		4.54E+04		ug/L	AMW-SW-02/01	5 / 5	-	4.54E+04	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	1.90E+00	J	2.70E+00	J	ug/L	AMW-SW-02/01	3 / 5	-	2.70E+00	--	6.30E+00	nc	6.00E+00	PAL	No	BSL
	7440-66-6	Zinc	4.50E+00		1.65E+01		ug/L	AMW-SW-04/01	5 / 5	-	1.65E+01	--	4.70E+02	nc	NA	NA	No	BSL
	91-57-6	2-Methylnaphthalene	2.00E-02	J	2.00E-02	J	ug/L	AMW-SW-02/01	1 / 5	-	2.00E-02	--	2.70E+00	nc	NA	NA	No	BSL
	83-32-9	Acenaphthene	1.00E-02	J	1.00E-02	J	ug/L	AMW-SW-04/01	1 / 5	-	1.00E-02	--	4.00E+01	nc	NA	NA	No	BSL
	56-55-3	Benzo(a)anthracene	1.00E-02	J	2.00E-02	J	ug/L	AMW-SW-05/01	2 / 5	-	2.00E-02	--	2.90E-02	ca	NA	NA	No	BSL
	50-32-8	Benzo(a)pyrene	3.00E-02	J	3.00E-02	J	ug/L	AMW-SW-05/01	1 / 5	-	3.00E-02	--	2.90E-03	ca	2.00E-02	PAL	Yes	ASL (both)
	205-99-2	Benzo(b)fluoranthene	2.00E-02	J	6.00E-02	J	ug/L	AMW-SW-05/01	2 / 5	-	6.00E-02	--	2.90E-02	ca	2.00E-02	PAL	Yes	ASL (both)
	191-24-2	Benzo(g,h,i)perylene	1.00E-02	J	3.00E-02	J	ug/L	AMW-SW-05/01	2 / 5	-	3.00E-02	--	8.70E+00	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)fluoranthene	1.00E-02	J	1.00E-02	J	ug/L	AMW-SW-05/01	1 / 5	-	1.00E-02	--	2.90E-01	ca	NA	NA	No	BSL
	105-60-2	Caprolactam	2.00E-01	J	4.50E-01	J	ug/L	AMW-SW-03/01	3 / 5	-	4.50E-01	--	7.70E+02	nc	NA	NA	No	BSL
	218-01-9	Chrysene	3.00E-02	J	5.00E-02	J	ug/L	AMW-SW-05/01	2 / 5	-	5.00E-02	--	2.90E+00	ca	2.00E-02	PAL	Yes	ASL (PAL)
	84-74-2	Di-n-butylphthalate	2.30E-01	J	2.30E-01	J	ug/L	AMW-SW-02/01, AMW-SW-03/01	2 / 5	-	2.30E-01	--	6.70E+01	nc	1.00E+02	PAL	No	BSL
	206-44-0	Fluoranthene	1.00E-02	J	1.30E-01		ug/L	AMW-SW-05/01	5 / 5	-	1.30E-01	--	6.30E+01	nc	8.00E+01	PAL	No	BSL
	86-73-7	Fluorene	1.00E-02	J	2.00E-02	J	ug/L	AMW-SW-03/01, AMW-SW-04/01, AMW-SW-05/01	4 / 5	-	2.00E-02	--	2.20E+01	nc	8.00E+01	PAL	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.00E-02	J	3.00E-02	J	ug/L	AMW-SW-05/01	2 / 5	-	3.00E-02	--	2.90E-02	ca	NA	NA	Yes	ASL (RSL)
	91-20-3	Naphthalene	1.00E-02	J	1.00E-02	J	ug/L	AMW-SW-02/01	1 / 5	-	1.00E-02	--	1.40E-01	ca	1.00E+01	PAL	No	BSL
	87-86-5	Pentachlorophenol	3.00E-02	J	2.10E-01	J	ug/L	AMW-SW-02/01	5 / 5	-	2.10E-01	--	3.50E-02	ca	1.00E-01	PAL	Yes	ASL (both)
	129-00-0	Pyrene	2.00E-02	J	1.10E-01		ug/L	AMW-SW-05/01	3 / 5	-	1.10E-01	--	8.70E+00	nc	NA	NA	No	BSL
	108-88-3	Toluene	1.60E-01	J	1.70E-01	J	ug/L	AMW-SW-02/01	3 / 5	-	1.70E-01	--	8.60E+01	nc	1.60E+02	PAL	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Tap Water (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for 'Chromium(VI)' was used as the SL for Chromium.
The SL for 'Pyrene' was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and Compounds' was used as the SL for Vanadium.

(3) Table 1 - Public Health Groundwater Quality Standards - Preventive Action Limit (PAL) - NR 140.10

(4) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: -Both - Exceeds the RSL and PAL
-or RSL - Exceeds the RSL, PAL - Exceeds the AL
Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
AL = Action Level
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
+ = Sample result I sgreater than four times the spike level.

TABLE 3.7
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment (Recreational User)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Quarry Pond Sediment	12672-29-6	Aroclor-1248	5.60E-02	1.10E+04	mg/kg	FVSC-05	77 / 77	2.50E-02 - 2.10E+03	1.10E+04	--	2.20E-01	ca	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	5.60E-02	1.10E+04	mg/kg	FVSC-05	77 / 77	2.50E-02 - 2.10E+03	1.10E+04	--	1.10E-01	nc	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes — Selection Reason: Above Screening Levels (ASL); Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
HQ = Hazard Quotient
SL = Screening Level

TABLE 3.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment (Recreational User)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Wilshire Pond Sediment	12672-29-6	Aroclor-1248	3.00E-01	3.60E+01 D	mg/kg	AMW-SD-01	11 / 11	-	3.60E+01	--	2.20E-01	ca	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	3.00E-01	3.60E+01 D	mg/kg	AMW-SD-01	11 / 11	-	3.60E+01	--	1.10E-01	nc	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
HQ = Hazard Quotient
D = Diluted analysis.
SL = Screening Level

TABLE 3.9
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Fish
Exposure Medium: Fish (Recreational Anger)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Quarry Pond Fish Fillets	12672-29-6	Aroclor-1248	2.50E+00 J	2.50E+01	mg/kg	AMQ-FTBH-0108/01	11 / 16	-	2.50E+01	--	1.58E-03	ca	NA	NA	Yes	ASL
Suspended and Bottom Feeders	PCB(†)	Total PCB (Calc)	2.50E+00 J	2.50E+01	mg/kg	AMQ-FTBH-0108/01	11 / 16	-	2.50E+01	--	1.58E-03	ca	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Screening levels for fish tissue consumption were calculated using the USEPA Regional Screening Level Calculator for Fish Tissue (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes — Selection Reason: Above Screening Levels (ASL); Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
HQ = Hazard Quotient
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
SL = Screening Level

TABLE 3.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Fish
Exposure Medium: Fish (Recreational Anger)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Concentration Qualifier	Maximum Concentration	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Quarry Pond Fish Fillets Bottom Feeders	12672-29-6	Aroclor-1248	2.50E+00	J	2.50E+01		mg/kg	AMQ-FTBH-0108/01	8 / 10	-	2.50E+01	--	1.58E-03	ca	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	2.50E+00	J	2.50E+01		mg/kg	AMQ-FTBH-0108/01	8 / 10	-	2.50E+01	--	1.58E-03	ca	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Screening levels for fish tissue consumption were calculated using the USEPA Regional Screening Level Calculator for Fish Tissue (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes — Selection Reason: Above Screening Levels (ASL); Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
HQ = Hazard Quotient
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
SL = Screening Level

TABLE 3.11
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Medium: Fish
Exposure Medium: Fish (Recreational Anger)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Quarry Pond Fish Fillets	12672-29-6	Aroclor-1248	2.70E+00	4.30E+00 J	mg/kg	AMQ-FTSH-0102/01	3 / 6	-	4.30E+00	--	1.58E-03	ca	NA	NA	Yes	ASL
Suspended Feeders	PCB(†)	Total PCB (Calc)	2.70E+00	4.30E+00 J	mg/kg	AMQ-FTSH-0102/01	3 / 6	-	4.30E+00	--	1.58E-03	ca	NA	NA	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Screening levels for fish tissue consumption were calculated using the USEPA Regional Screening Level Calculator for Fish Tissue (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes — Selection Reason: Above Screening Levels (ASL); Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
HQ = Hazard Quotient
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
SL = Screening Level

TABLE 3.12
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Residential)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Amcast North Total Soil (0 - 10 ft)	7429-90-5	Aluminum	1.89E+03		1.18E+04	J	mg/kg	AMN-SO-05	18 / 18	-	1.18E+04	--	7.70E+03	nc	NA	NA	Yes	ASL
	7440-38-2	Arsenic	6.10E-01	J	5.30E+00		mg/kg	AMN-SO-09	31 / 31	4.30E-01 - 4.90E-01	5.30E+00	--	6.10E-01	ca	NA	NA	Yes	ASL
	7440-39-3	Barium	9.60E+00	J	2.63E+02	J	mg/kg	AMN-SO-05	18 / 18	-	2.63E+02	--	1.50E+03	nc	NA	NA	No	BSL
	7440-41-7	Beryllium	2.00E-01	J	3.40E-01	J	mg/kg	AMN-SO-09	4 / 18	-	3.40E-01	--	1.60E+01	nc	NA	NA	No	BSL
	7440-43-9	Cadmium	1.50E-01	J	6.60E-01		mg/kg	FVMW-27	16 / 28	3.80E-02 - 4.40E-02	6.60E-01	--	7.00E+00	nc	NA	NA	No	BSL
	7440-70-2	Calcium	9.10E+03	J	1.95E+05	J	mg/kg	AMN-SO-07	18 / 18	-	1.95E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	3.60E+00	J	3.04E+02		mg/kg	AMN-SO-01	31 / 31	3.20E-02 - 3.80E-02	3.04E+02	--	1.20E+04	nc	NA	NA	No	BSL
	7440-48-4	Cobalt	2.00E+00	J	7.70E+00		mg/kg	AMN-SO-10	13 / 18	-	7.70E+00	--	2.30E+00	nc	NA	NA	Yes	ASL
	7440-50-8	Copper	4.70E+00	J	1.14E+02	J	mg/kg	AMN-SO-05	18 / 18	-	1.14E+02	--	3.10E+02	nc	NA	NA	No	BSL
	7439-89-6	Iron	4.52E+03	J	1.76E+04	J	mg/kg	AMN-SO-05	18 / 18	-	1.76E+04	--	5.50E+03	nc	NA	NA	Yes	ASL
	7439-92-1	Lead	3.50E-01	J	7.34E+01		mg/kg	AMN-SO-05	31 / 31	3.10E-01 - 3.70E-01	7.34E+01	--	4.00E+02	nc	NA	NA	No	BSL
	7439-95-4	Magnesium	5.01E+03	J	1.40E+05	J	mg/kg	AMN-SO-05	18 / 18	-	1.40E+05	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	1.77E+02	J	8.05E+02		mg/kg	AMN-SO-10	18 / 18	-	8.05E+02	--	1.80E+02	nc	NA	NA	Yes	ASL
	7439-97-6	Mercury	7.00E-03		8.00E-02	J	mg/kg	AMN-SO-09	28 / 31	1.40E-03 - 1.60E-02	8.00E-02	--	2.30E+00	nc	NA	NA	No	BSL
	7440-02-0	Nickel	3.10E+00	J	2.06E+01		mg/kg	AMN-SO-01	18 / 18	-	2.06E+01	--	1.50E+02	nc	NA	NA	No	BSL
	7440-09-7	Potassium	2.62E+02	J	1.12E+03		mg/kg	AMN-SO-07	16 / 18	-	1.12E+03	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	1.85E+02	J	5.31E+02	J	mg/kg	AMN-SO-04	7 / 18	-	5.31E+02	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	6.80E+00	J	3.33E+01		mg/kg	AMN-SO-01	18 / 18	-	3.33E+01	--	3.90E+01	nc	NA	NA	No	BSL
	7440-66-6	Zinc	1.07E+01		2.21E+02		mg/kg	AMN-SO-05	18 / 18	-	2.21E+02	--	2.30E+03	nc	NA	NA	No	BSL
	53469-21-9	Aroclor-1242	7.50E-02		6.40E-01	J	mg/kg	B-2	3 / 45	1.30E-02 - 3.20E-02	6.40E-01	--	2.20E-01	ca	NA	NA	Yes	ASL
	12672-29-6	Aroclor-1248	1.80E-02	J	6.90E+02		mg/kg	FVMW-27	34 / 58	1.30E-02 - 6.00E+01	6.90E+02	--	2.20E-01	ca	NA	NA	Yes	ASL
	11097-69-1	Aroclor-1254	3.60E-02	J	3.60E-02	J	mg/kg	B-10	1 / 45	1.30E-02 - 3.20E-02	3.60E-02	--	1.10E-01	nc	NA	NA	No	BSL
	11096-82-5	Aroclor-1260	2.70E-02	J	2.70E-02	J	mg/kg	B-11	1 / 45	1.30E-02 - 3.20E-02	2.70E-02	--	2.20E-01	ca	NA	NA	No	BSL
	PCB	Total PCB (Calc)	1.80E-02	J	6.90E+02		mg/kg	FVMW-27	37 / 58	1.30E-02 - 6.00E+01	6.90E+02	--	1.10E-01	nc	NA	NA	Yes	ASL
	91-57-6	2-Methylnaphthalene	8.00E-04	J	3.40E-01		mg/kg	FVSS-31	8 / 19	2.50E-01 - 2.50E-01	3.40E-01	--	2.30E+01	nc	NA	NA	No	BSL
	106-44-5	4-Methylphenol	7.70E-03	J	7.70E-03	J	mg/kg	AMN-SO-09	1 / 18	-	7.70E-03	--	6.10E+02	nc	NA	NA	No	BSL
	100-02-7	4-Nitrophenol	6.60E-03	J	6.60E-03	J	mg/kg	AMN-SO-02	1 / 18	-	6.60E-03	--	4.80E+00	ca	NA	NA	No	BSL
	83-32-9	Acenaphthene	1.10E-03	J	7.10E-01		mg/kg	FVSS-31	5 / 19	2.30E-01 - 2.30E-01	7.10E-01	--	3.40E+02	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	4.50E-03		2.10E-01		mg/kg	AMN-SO-09	5 / 18	-	2.10E-01	--	3.40E+02	nc	NA	NA	No	BSL
	98-86-2	Acetophenone	7.00E-03	J	2.10E-02	J	mg/kg	AMN-SO-04	10 / 18	-	2.10E-02	--	7.80E+02	nc	NA	NA	No	BSL
	120-12-7	Anthracene	8.30E-04	J	3.40E+00		mg/kg	FVSS-31	9 / 19	1.40E-01 - 1.40E-01	3.40E+00	--	1.70E+03	nc	NA	NA	No	BSL
	100-52-7	Benzaldehyde	6.80E-03	J	6.80E-03	J	mg/kg	AMN-SO-05	1 / 18	-	6.80E-03	--	7.80E+02	nc	NA	NA	No	BSL
	56-55-3	Benzo(a)Anthracene	7.80E-04	J	4.50E+00		mg/kg	FVSS-31	13 / 20	3.90E-02 - 2.00E-01	4.50E+00	--	1.50E-01	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)Pyrene	7.70E-04	J	3.70E+00		mg/kg	FVSS-31	16 / 22	2.90E-02 - 1.60E-01	3.70E+00	--	1.50E-02	ca	NA	NA	Yes	ASL
	205-99-2	Benzo(b)Fluoranthene	5.70E-04	J	3.10E+00		mg/kg	FVSS-31	16 / 20	5.20E-02 - 2.80E-01	3.10E+00	--	1.50E-01	ca	NA	NA	Yes	ASL
	191-24-2	Benzo(g,h,i)Perylene	1.30E-03	J	2.30E+00		mg/kg	FVSS-31	12 / 20	6.00E-02 - 3.00E-01	2.30E+00	--	1.70E+02	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)Fluoranthene	5.40E-04	J	3.00E+00		mg/kg	FVSS-31	12 / 19	4.20E-01 - 4.20E-01	3.00E+00	--	1.50E+00	ca	NA	NA	Yes	ASL
	105-60-2	Caprolactam	6.80E-03	J	1.50E-02	J	mg/kg	AMN-SO-10	7 / 18	-	1.50E-02	--	3.10E+03	nc	NA	NA	No	BSL
	86-74-8	Carbazole	5.50E-03	J	1.20E+00		mg/kg	FVSS-31	4 / 19	2.30E-01 - 2.30E-01	1.20E+00	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	6.30E-04	J	4.40E+00		mg/kg	FVSS-31	16 / 20	5.90E-02 - 3.10E-01	4.40E+00	--	1.50E+01	ca	NA	NA	No	BSL
	53-70-3	Dibenzo(a,h)Anthracene	6.90E-03	J	9.20E-01		mg/kg	FVSS-31	9 / 19	2.10E-01 - 2.10E-01	9.20E-01	--	1.50E-02	ca	NA	NA	Yes	ASL
	132-64-9	Dibenzofuran	7.30E-01		7.30E-01		mg/kg	FVSS-31	1 / 19	2.60E-01 - 2.60E-01	7.30E-01	--	7.80E+00	nc	NA	NA	No	BSL
	131-11-3	Dimethyl Phthalate	5.60E-03	J	1.40E-02	J	mg/kg	AMN-SO-10	7 / 18	-	1.40E-02	--	4.90E+03	nc	NA	NA	No	BSL
	84-74-2	Di-n-Butylphthalate	6.40E-03	J	1.40E-01		mg/kg	FVSS-16	11 / 20	4.50E-02 - 4.80E-02	1.40E-01	--	6.10E+02	nc	NA	NA	No	BSL
	117-84-0	Di-n-Octylphthalate	9.00E-02		9.00E-02		mg/kg	FVSS-18	1 / 19	5.70E-02 - 5.70E-02	9.00E-02	--	3.50E+01	ca	NA	NA	No	BSL
	206-44-0	Fluoranthene	9.50E-04	J	1.00E+01		mg/kg	FVSS-31	15 / 20	4.20E-02 - 2.20E-01	1.00E+01	--	2.30E+02	nc	NA	NA	No	BSL
	86-73-7	Fluorene	5.50E-04	J	1.00E+00		mg/kg	FVSS-31	7 / 19	2.40E-01 - 2.40E-01	1.00E+00	--	2.30E+02	nc	NA	NA	No	BSL
	193-39-5	Indeno(1,2,3-cd)Pyrene	9.60E-04	J	3.40E+00		mg/kg	FVSS-31	14 / 20	9.70E-02 - 5.00E-01	3.40E+00	--	1.50E-01	ca	NA	NA	Yes	ASL

TABLE 3.12
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Residential)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
	91-20-3	Naphthalene	1.10E-03	J	3.60E-01		mg/kg	FVSS-31	9 / 47	2.50E-02 - 2.30E-01	3.60E-01	--	3.60E+00	ca	NA	NA	No	BSL
	87-86-5	Pentachlorophenol	1.30E-02	J	1.30E-02	J	mg/kg	AMN-SO-10	1 / 12	-	1.30E-02	--	8.90E-01	ca	NA	NA	No	BSL
	85-01-8	Phenanthrene	9.80E-04	J	1.10E+01		mg/kg	FVSS-31	12 / 19	2.60E-01 - 2.60E-01	1.10E+01	--	1.70E+03	nc	NA	NA	No	BSL
	108-95-2	Phenol	5.80E-03	J	1.10E-02	J	mg/kg	AMN-SO-09	5 / 18	-	1.10E-02	--	1.80E+03	nc	NA	NA	No	BSL
	129-00-0	Pyrene	9.30E-04	J	1.00E+01		mg/kg	FVSS-31	15 / 20	5.60E-02 - 2.90E-01	1.00E+01	--	1.70E+02	nc	NA	NA	No	BSL
	78-93-3	2-Butanone	5.30E-03	J	8.30E-03	J	mg/kg	AMN-SO-04	2 / 18	-	8.30E-03	--	2.80E+03	nc	NA	NA	No	BSL
	67-64-1	Acetone	3.60E-03	J	1.30E-02		mg/kg	AMN-SO-04	6 / 18	-	1.30E-02	--	6.10E+03	nc	NA	NA	No	BSL
	67-66-3	Chloroform	5.70E-04	J	5.70E-04	J	mg/kg	AMN-SO-04	1 / 46	2.50E-02 - 2.50E-02	5.70E-04	--	2.90E-01	ca	NA	NA	No	BSL
	156-59-2	cis-1,2-Dichloroethene	5.10E-02	J	2.30E-01		mg/kg	B-2	4 / 46	2.50E-02 - 3.20E-02	2.30E-01	--	1.60E+01	nc	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.30E-04	J	2.30E-04	J	mg/kg	AMN-SO-03	3 / 46	5.00E-02 - 5.00E-02	2.30E-04	--	6.30E+01	nc	NA	NA	No	BSL
	108-88-3	Toluene	1.40E-04	J	3.80E-04	J	mg/kg	AMN-SO-03, AMN-SO-04	7 / 46	2.50E-02 - 2.50E-02	3.80E-04	--	5.00E+02	nc	NA	NA	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for Bis(2-ethylhexyl)phthalate was used as the SL for Di-n-octylphthalate.
The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for Diethyl Phthalate was used as the SL for Dimethyl Phthalate.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Nitrobenzene was used as the SL for 4-Nitrophenol.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes

Selection Reason:
- Above Screening Levels (ASL)

Deletion Reason:
- Below Screening Level (BSL)
- Essential Nutrient (NUT)
- No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
IEUBK = Integrated Exposure Uptake Biokinetic Model
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.

TABLE 3.13
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Industrial Worker, Construction Worker)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Amcast North Total Soil (0 - 10 ft)	7429-90-5	Aluminum	1.89E+03		1.18E+04	J	mg/kg	AMN-SO-05	18 / 18	-	1.18E+04	--	9.90E+04	nc	NA	NA	No	BSL
	7440-38-2	Arsenic	6.10E-01	J	5.30E+00		mg/kg	AMN-SO-09	31 / 31	4.30E-01 - 4.90E-01	5.30E+00	--	2.40E+00	ca	NA	NA	Yes	ASL
	7440-39-3	Barium	9.60E+00	J	2.63E+02	J	mg/kg	AMN-SO-05	18 / 18	-	2.63E+02	--	1.90E+04	nc	NA	NA	No	BSL
	7440-41-7	Beryllium	2.00E-01	J	3.40E-01	J	mg/kg	AMN-SO-09	4 / 18	-	3.40E-01	--	2.00E+02	nc	NA	NA	No	BSL
	7440-43-9	Cadmium	1.50E-01	J	6.60E-01		mg/kg	FVMW-27	16 / 28	3.80E-02 - 4.40E-02	6.60E-01	--	8.00E+01	nc	NA	NA	No	BSL
	7440-70-2	Calcium	9.10E+03	J	1.95E+05	J	mg/kg	AMN-SO-07	18 / 18	-	1.95E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	3.60E+00	J	3.04E+02		mg/kg	AMN-SO-01	31 / 31	3.20E-02 - 3.80E-02	3.04E+02	--	1.50E+05	nc	NA	NA	No	BSL
	7440-48-4	Cobalt	2.00E+00	J	7.70E+00		mg/kg	AMN-SO-10	13 / 18	-	7.70E+00	--	3.00E+01	nc	NA	NA	No	BSL
	7440-50-8	Copper	4.70E+00	J	1.14E+02	J	mg/kg	AMN-SO-05	18 / 18	-	1.14E+02	--	4.10E+03	nc	NA	NA	No	BSL
	7439-89-6	Iron	4.52E+03	J	1.76E+04	J	mg/kg	AMN-SO-05	18 / 18	-	1.76E+04	--	7.20E+04	nc	NA	NA	No	BSL
	7439-92-1	Lead	3.50E-01	J	7.34E+01		mg/kg	AMN-SO-05	31 / 31	3.10E-01 - 3.70E-01	7.34E+01	--	8.00E+02	nc	NA	NA	No	BSL
	7439-95-4	Magnesium	5.01E+03	J	1.40E+05	J	mg/kg	AMN-SO-05	18 / 18	-	1.40E+05	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	1.77E+02	J	8.05E+02		mg/kg	AMN-SO-10	18 / 18	-	8.05E+02	--	2.30E+03	nc	NA	NA	No	BSL
	7439-97-6	Mercury	7.00E-03		8.00E-02	J	mg/kg	AMN-SO-09	28 / 31	1.40E-03 - 1.60E-02	8.00E-02	--	3.10E+01	nc	NA	NA	No	BSL
	7440-02-0	Nickel	3.10E+00	J	2.06E+01		mg/kg	AMN-SO-01	18 / 18	-	2.06E+01	--	2.00E+03	nc	NA	NA	No	BSL
	7440-09-7	Potassium	2.62E+02	J	1.12E+03		mg/kg	AMN-SO-07	16 / 18	-	1.12E+03	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	1.85E+02	J	5.31E+02	J	mg/kg	AMN-SO-04	7 / 18	-	5.31E+02	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	6.80E+00	J	3.33E+01		mg/kg	AMN-SO-01	18 / 18	-	3.33E+01	--	5.10E+02	nc	NA	NA	No	BSL
	7440-66-6	Zinc	1.07E+01		2.21E+02		mg/kg	AMN-SO-05	18 / 18	-	2.21E+02	--	3.10E+04	nc	NA	NA	No	BSL
	53469-21-9	Aroclor-1242	7.50E-02		6.40E-01	J	mg/kg	B-2	3 / 45	1.30E-02 - 3.20E-02	6.40E-01	--	7.40E-01	ca	NA	NA	No	BSL
	12672-29-6	Aroclor-1248	1.80E-02	J	6.90E+02		mg/kg	FVMW-27	34 / 58	1.30E-02 - 6.00E+01	6.90E+02	--	7.40E-01	ca	NA	NA	Yes	ASL
	11097-69-1	Aroclor-1254	3.60E-02	J	3.60E-02	J	mg/kg	B-10	1 / 45	1.30E-02 - 3.20E-02	3.60E-02	--	7.40E-01	ca	NA	NA	No	BSL
	11096-82-5	Aroclor-1260	2.70E-02	J	2.70E-02	J	mg/kg	B-11	1 / 45	1.30E-02 - 3.20E-02	2.70E-02	--	7.40E-01	ca	NA	NA	No	BSL
	PCB	Total PCB (Calc)	1.80E-02	J	6.90E+02		mg/kg	FVMW-27	37 / 58	1.30E-02 - 6.00E+01	6.90E+02	--	7.40E-01	ca	NA	NA	Yes	ASL
	91-57-6	2-Methylnaphthalene	8.00E-04	J	3.40E-01		mg/kg	FVSS-31	8 / 19	2.50E-01 - 2.50E-01	3.40E-01	--	2.20E+02	nc	NA	NA	No	BSL
	106-44-5	4-Methylphenol	7.70E-03	J	7.70E-03	J	mg/kg	AMN-SO-09	1 / 18	-	7.70E-03	--	6.20E+03	nc	NA	NA	No	BSL
	100-02-7	4-Nitrophenol	6.60E-03	J	6.60E-03	J	mg/kg	AMN-SO-02	1 / 18	-	6.60E-03	--	2.40E+01	ca	NA	NA	No	BSL
	83-32-9	Acenaphthene	1.10E-03	J	7.10E-01		mg/kg	FVSS-31	5 / 19	2.30E-01 - 2.30E-01	7.10E-01	--	3.30E+03	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	4.50E-03		2.10E-01		mg/kg	AMN-SO-09	5 / 18	-	2.10E-01	--	3.30E+03	nc	NA	NA	No	BSL
	98-86-2	Acetophenone	7.00E-03	J	2.10E-02	J	mg/kg	AMN-SO-04	10 / 18	-	2.10E-02	--	2.52E+03	sat	NA	NA	No	BSL
	120-12-7	Anthracene	8.30E-04	J	3.40E+00		mg/kg	FVSS-31	9 / 19	1.40E-01 - 1.40E-01	3.40E+00	--	1.70E+04	nc	NA	NA	No	BSL
	100-52-7	Benzaldehyde	6.80E-03	J	6.80E-03	J	mg/kg	AMN-SO-05	1 / 18	-	6.80E-03	--	1.16E+03	sat	NA	NA	No	BSL
	56-55-3	Benzo(a)Anthracene	7.80E-04	J	4.50E+00		mg/kg	FVSS-31	13 / 20	3.90E-02 - 2.00E-01	4.50E+00	--	2.10E+00	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)Pyrene	7.70E-04	J	3.70E+00		mg/kg	FVSS-31	16 / 22	2.90E-02 - 1.60E-01	3.70E+00	--	2.10E-01	ca	NA	NA	Yes	ASL
	205-99-2	Benzo(b)Fluoranthene	5.70E-04	J	3.10E+00		mg/kg	FVSS-31	16 / 20	5.20E-02 - 2.80E-01	3.10E+00	--	2.10E+00	ca	NA	NA	Yes	ASL
	191-24-2	Benzo(g,h,i)Perylene	1.30E-03	J	2.30E+00		mg/kg	FVSS-31	12 / 20	6.00E-02 - 3.00E-01	2.30E+00	--	1.70E+03	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)Fluoranthene	5.40E-04	J	3.00E+00		mg/kg	FVSS-31	12 / 19	4.20E-01 - 4.20E-01	3.00E+00	--	2.10E+01	ca	NA	NA	No	BSL
	105-60-2	Caprolactam	6.80E-03	J	1.50E-02	J	mg/kg	AMN-SO-10	7 / 18	-	1.50E-02	--	3.10E+04	nc	NA	NA	No	BSL
	86-74-8	Carbazole	5.50E-03	J	1.20E+00		mg/kg	FVSS-31	4 / 19	2.30E-01 - 2.30E-01	1.20E+00	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	6.30E-04	J	4.40E+00		mg/kg	FVSS-31	16 / 20	5.90E-02 - 3.10E-01	4.40E+00	--	2.10E+02	ca	NA	NA	No	BSL
	53-70-3	Dibenzo(a,h)Anthracene	6.90E-03	J	9.20E-01		mg/kg	FVSS-31	9 / 19	2.10E-01 - 2.10E-01	9.20E-01	--	2.10E-01	ca	NA	NA	Yes	ASL
	132-64-9	Dibenzofuran	7.30E-01		7.30E-01		mg/kg	FVSS-31	1 / 19	2.60E-01 - 2.60E-01	7.30E-01	--	1.00E+02	nc	NA	NA	No	BSL
	131-11-3	Dimethyl Phthalate	5.60E-03	J	1.40E-02	J	mg/kg	AMN-SO-10	7 / 18	-	1.40E-02	--	4.90E+04	nc	NA	NA	No	BSL
	84-74-2	Di-n-Butylphthalate	6.40E-03	J	1.40E-01		mg/kg	FVSS-16	11 / 20	4.50E-02 - 4.80E-02	1.40E-01	--	6.20E+03	nc	NA	NA	No	BSL
	117-84-0	Di-n-Octylphthalate	9.00E-02		9.00E-02		mg/kg	FVSS-18	1 / 19	5.70E-02 - 5.70E-02	9.00E-02	--	1.20E+02	ca	NA	NA	No	BSL
	206-44-0	Fluoranthene	9.50E-04	J	1.00E+01		mg/kg	FVSS-31	15 / 20	4.20E-02 - 2.20E-01	1.00E+01	--	2.20E+03	nc	NA	NA	No	BSL
	86-73-7	Fluorene	5.50E-04	J	1.00E+00		mg/kg	FVSS-31	7 / 19	2.40E-01 - 2.40E-01	1.00E+00	--	2.20E+03	nc	NA	NA	No	BSL
	193-39-5	Indeno(1,2,3-cd)Pyrene	9.60E-04	J	3.40E+00		mg/kg	FVSS-31	14 / 20	9.70E-02 - 5.00E-01	3.40E+00	--	2.10E+00	ca	NA	NA	Yes	ASL

TABLE 3.13
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Industrial Worker, Construction Worker)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Qualifier	Maximum Concentration	Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
	91-20-3	Naphthalene	1.10E-03	J	3.60E-01		mg/kg	FVSS-31	9 / 47	2.50E-02 - 2.30E-01	3.60E-01	--	1.80E+01	ca	NA	NA	No	BSL
	87-86-5	Pentachlorophenol	1.30E-02	J	1.30E-02	J	mg/kg	AMN-SO-10	1 / 12	-	1.30E-02	--	2.70E+00	ca	NA	NA	No	BSL
	85-01-8	Phenanthrene	9.80E-04	J	1.10E+01		mg/kg	FVSS-31	12 / 19	2.60E-01 - 2.60E-01	1.10E+01	--	1.70E+04	nc	NA	NA	No	BSL
	108-95-2	Phenol	5.80E-03	J	1.10E-02	J	mg/kg	AMN-SO-09	5 / 18	-	1.10E-02	--	1.80E+04	nc	NA	NA	No	BSL
	129-00-0	Pyrene	9.30E-04	J	1.00E+01		mg/kg	FVSS-31	15 / 20	5.60E-02 - 2.90E-01	1.00E+01	--	1.70E+03	nc	NA	NA	No	BSL
	78-93-3	2-Butanone	5.30E-03	J	8.30E-03	J	mg/kg	AMN-SO-04	2 / 18	-	8.30E-03	--	2.00E+04	nc	NA	NA	No	BSL
	67-64-1	Acetone	3.60E-03	J	1.30E-02		mg/kg	AMN-SO-04	6 / 18	-	1.30E-02	--	6.30E+04	nc	NA	NA	No	BSL
	67-66-3	Chloroform	5.70E-04	J	5.70E-04	J	mg/kg	AMN-SO-04	1 / 46	2.50E-02 - 2.50E-02	5.70E-04	--	1.50E+00	ca	NA	NA	No	BSL
	156-59-2	cis-1,2-Dichloroethene	5.10E-02	J	2.30E-01		mg/kg	B-2	4 / 46	2.50E-02 - 3.20E-02	2.30E-01	--	2.00E+02	nc	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.30E-04	J	2.30E-04	J	mg/kg	AMN-SO-03	3 / 46	5.00E-02 - 5.00E-02	2.30E-04	--	2.58E+02	sat	NA	NA	No	BSL
	108-88-3	Toluene	1.40E-04	J	3.80E-04	J	mg/kg	AMN-SO-03, AMN-SO-04	7 / 46	2.50E-02 - 2.50E-02	3.80E-04	--	8.18E+02	sat	NA	NA	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Industrial Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for Bis(2-ethylhexyl)phthalate was used as the SL for Di-n-octylphthalate.
The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for Diethyl Phthalate was used as the SL for Dimethyl Phthalate.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Nitrobenzene was used as the SL for 4-Nitrophenol.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes

Selection Reason:
- Above Screening Levels (ASL)

Deletion Reason:
- Below Screening Level (BSL)
- Essential Nutrient (NUT)
- No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
ALM= Adult Lead Methodology
csat = Saturation Concentration
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.

TABLE 3.14
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Residential)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Min Qual	Maximum Concentration	Max Qual	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Amcast South Total Soil (0 - 10 ft)	7429-90-5	Aluminum	3.04E+03	J	1.97E+04	J	mg/kg	AMS-SO-07	17 / 17	-	1.97E+04	--	7.70E+03	nc	NA	NA	Yes	ASL
	7440-38-2	Arsenic	8.30E-01	J	8.20E+00		mg/kg	AMS-SO-04	33 / 33	4.30E-01 - 6.40E-01	8.20E+00	--	6.10E-01	ca	NA	NA	Yes	ASL
	7440-39-3	Barium	2.42E+01		1.94E+02		mg/kg	AMS-SO-07	17 / 17	-	1.94E+02	--	1.50E+03	nc	NA	NA	No	BSL
	7440-41-7	Beryllium	1.90E-01	J	5.40E-01	J	mg/kg	AMS-SO-03	7 / 17	-	5.40E-01	--	1.60E+01	nc	NA	NA	No	BSL
	7440-43-9	Cadmium	1.40E-01	J	2.60E+01		mg/kg	FVSS-06	29 / 34	3.80E-02 - 2.00E-01	2.60E+01	--	7.00E+00	nc	NA	NA	Yes	ASL
	7440-70-2	Calcium	2.49E+03	J	1.67E+05	J	mg/kg	AMS-SO-05	17 / 17	-	1.67E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	4.60E+00		1.50E+02		mg/kg	FVSS-06	34 / 34	3.30E-02 - 3.50E-01	1.50E+02	--	1.20E+04	nc	NA	NA	No	BSL
	7440-48-4	Cobalt	1.60E+00	J	1.23E+01		mg/kg	AMS-SO-04	16 / 17	-	1.23E+01	--	2.30E+00	nc	NA	NA	Yes	ASL
	7440-50-8	Copper	1.01E+01		1.59E+03		mg/kg	AMS-SO-07	17 / 17	-	1.59E+03	--	3.10E+02	nc	NA	NA	Yes	ASL
	7439-89-6	Iron	5.34E+03	J	3.01E+04	J	mg/kg	AMS-SO-04	17 / 17	-	3.01E+04	--	5.50E+03	nc	NA	NA	Yes	ASL
	7439-92-1	Lead	5.40E+00		1.20E+03		mg/kg	FVSS-06	34 / 34	3.20E-01 - 1.70E+00	1.20E+03	--	4.00E+02	nc	NA	NA	Yes	ASL
	7439-95-4	Magnesium	2.33E+03	J	8.98E+04	J	mg/kg	AMS-SO-04	17 / 17	-	8.98E+04	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	6.96E+01	J	1.20E+03	J	mg/kg	AMS-SO-04	17 / 17	-	1.20E+03	--	1.80E+02	nc	NA	NA	Yes	ASL
	7439-97-6	Mercury	1.50E-02		6.70E-01		mg/kg	FVSS-06	22 / 34	1.50E-03 - 3.10E-03	6.70E-01	--	2.30E+00	nc	NA	NA	No	BSL
	7440-02-0	Nickel	4.30E+00		3.25E+01		mg/kg	AMS-SO-07	17 / 17	-	3.25E+01	--	1.50E+02	nc	NA	NA	No	BSL
	7440-09-7	Potassium	2.89E+02	J	7.62E+02	J	mg/kg	AMS-SO-04	7 / 17	-	7.62E+02	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	3.54E+02	J	1.08E+03		mg/kg	AMS-SO-02	3 / 17	-	1.08E+03	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	1.06E+01		7.59E+01		mg/kg	AMS-SO-04	17 / 17	-	7.59E+01	--	3.90E+01	nc	NA	NA	Yes	ASL
	7440-66-6	Zinc	2.99E+01		3.11E+02		mg/kg	AMS-SO-07	17 / 17	-	3.11E+02	--	2.30E+03	nc	NA	NA	No	BSL
	53469-21-9	Aroclor-1242	3.40E-02		9.30E+00		mg/kg	07A SB-3	7 / 27	-	9.30E+00	--	2.20E-01	ca	NA	NA	Yes	ASL
	12672-29-6	Aroclor-1248	3.60E-02	J	4.50E+01	D	mg/kg	AMS-SO-07	19 / 35	2.30E-02 - 4.00E+00	4.50E+01	--	2.20E-01	ca	NA	NA	Yes	ASL
	11097-69-1	Aroclor-1254	6.10E-01		6.10E-01		mg/kg	AMS-SO-01	1 / 27	-	6.10E-01	--	1.10E-01	nc	NA	NA	Yes	ASL
	PCB(†)	Total PCB (Calc)	3.40E-02		4.50E+01	D	mg/kg	AMS-SO-07	27 / 35	2.30E-02 - 4.00E+00	4.50E+01	--	1.10E-01	nc	NA	NA	Yes	ASL
	92-52-4	1,1'-Biphenyl	1.60E-01	J	1.60E-01	J	mg/kg	AMS-SO-10	1 / 17	-	1.60E-01	--	5.10E+00	nc	NA	NA	No	BSL
	541-73-1	1,3-Dichlorobenzene	3.20E-04	J	3.20E-03	B,J	mg/kg	01A SB-1	2 / 23	-	3.20E-03	--	1.90E+02	nc	NA	NA	No	BSL
	106-46-7	1,4-Dichlorobenzene	6.50E-03	J	6.50E-03	J	mg/kg	AMS-SO-05	1 / 23	-	6.50E-03	--	2.40E+00	ca	NA	NA	No	BSL
	105-67-9	2,4-Dimethylphenol	6.50E-01	J	6.50E-01	J	mg/kg	AMS-SO-05	1 / 17	-	6.50E-01	--	1.20E+02	nc	NA	NA	No	BSL
	91-57-6	2-Methylnaphthalene	1.10E-03	J	2.10E+00		mg/kg	FVSS-05A	12 / 19	4.70E-02 - 1.30E+00	2.10E+00	--	2.30E+01	nc	NA	NA	No	BSL
	106-44-5	4-Methylphenol	3.00E+00		3.00E+00		mg/kg	AMS-SO-05	1 / 17	-	3.00E+00	--	6.10E+02	nc	NA	NA	No	BSL
	83-32-9	Acenaphthene	7.30E-04	J	2.30E+01		mg/kg	FVSS-05A	10 / 19	4.10E-01 - 1.10E+00	2.30E+01	--	3.40E+02	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	1.40E-03	J	1.20E+00		mg/kg	AMS-SO-06	10 / 18	3.70E-02 - 3.70E-02	1.20E+00	--	3.40E+02	nc	NA	NA	No	BSL
	98-86-2	Acetophenone	5.70E-03	J	1.00E-02	J	mg/kg	AMS-SO-02	4 / 17	-	1.00E-02	--	7.80E+02	nc	NA	NA	No	BSL
	120-12-7	Anthracene	7.10E-04	J	2.60E+01		mg/kg	FVSS-05A	20 / 22	2.50E-02 - 7.20E-01	2.60E+01	--	1.70E+03	nc	NA	NA	No	BSL
	100-52-7	Benzaldehyde	9.80E-03	J	1.10E-02	J	mg/kg	AMS-SO-08	2 / 17	-	1.10E-02	--	7.80E+02	nc	NA	NA	No	BSL
	56-55-3	Benzo(a)anthracene	3.10E-03	J	7.10E+01		mg/kg	FVSS-05A	25 / 27	3.50E-02 - 1.00E+00	7.10E+01	--	1.50E-01	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)pyrene	2.90E-03	J	8.00E+01		mg/kg	FVSS-05A	25 / 27	2.70E-02 - 7.90E-01	8.00E+01	--	1.50E-02	ca	NA	NA	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	3.10E-03	J	8.60E+01		mg/kg	FVSS-05A	26 / 27	4.80E-02 - 1.40E+00	8.60E+01	--	1.50E-01	ca	NA	NA	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	1.30E-03	J	6.70E+01		mg/kg	FVSS-05A	22 / 25	5.30E-02 - 1.50E+00	6.70E+01	--	1.70E+02	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)fluoranthene	1.60E-03	J	5.80E+01		mg/kg	FVSS-05A	23 / 25	7.20E-02 - 2.10E+00	5.80E+01	--	1.50E+00	ca	NA	NA	Yes	ASL
	85-68-7	Benzyl Butyl Phthalate	2.40E-01		2.40E-01		mg/kg	FVMW-22	1 / 18	4.90E-02 - 4.90E-02	2.40E-01	--	2.60E+02	ca	NA	NA	No	BSL
	105-60-2	Caprolactam	8.90E-03	J	2.80E-02	J	mg/kg	AMS-SO-02	4 / 17	-	2.80E-02	--	3.10E+03	nc	NA	NA	No	BSL
	86-74-8	Carbazole	6.50E-03	J	1.40E+01		mg/kg	FVSS-05A	8 / 19	4.20E-01 - 1.20E+00	1.40E+01	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	1.80E-03	J	7.80E+01		mg/kg	FVSS-05A	27 / 27	5.40E-02 - 1.60E+00	7.80E+01	--	1.50E+01	ca	NA	NA	Yes	ASL
	53-70-3	Dibenzo(a,h)anthracene	1.00E-03	J	1.40E+01		mg/kg	FVSS-05A	18 / 21	4.00E-02 - 1.10E+00	1.40E+01	--	1.50E-02	ca	NA	NA	Yes	ASL
	132-64-9	Dibenzofuran	1.80E-02	J	1.50E+01		mg/kg	FVSS-05A	6 / 19	4.70E-01 - 1.30E+00	1.50E+01	--	7.80E+00	nc	NA	NA	Yes	ASL
	84-66-2	Diethyl Phthalate	4.30E-02	J	5.10E-02		mg/kg	FVSB-8	2 / 18	4.30E-02 - 4.30E-02	5.10E-02	--	4.90E+03	nc	NA	NA	No	BSL
	131-11-3	Dimethyl Phthalate	6.00E-03	J	2.00E-02	J	mg/kg	AMS-SO-02	5 / 17	-	2.00E-02	--	4.90E+03	nc	NA	NA	No	BSL
	84-74-2	Di-n-butylphthalate	6.70E-03	J	1.60E+00	J	mg/kg	AMS-SO-01	9 / 19	4.70E-02 - 5.00E-02	1.60E+00	--	6.10E+02	nc	NA	NA	No	BSL

TABLE 3.14
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Residential)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
	206-44-0	Fluoranthene	2.40E-03	J	1.10E+02		mg/kg	FVSS-05A	27 / 28	3.80E-02 - 1.10E+00	1.10E+02	--	2.30E+02	nc	NA	NA	No	BSL
	86-73-7	Fluorene	1.00E-03	J	2.50E+01		mg/kg	FVSS-05A	11 / 19	4.40E-01 - 1.20E+00	2.50E+01	--	2.30E+02	nc	NA	NA	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-03	J	7.80E+01		mg/kg	FVSS-05A	22 / 23	8.60E-02 - 2.50E+00	7.80E+01	--	1.50E-01	ca	NA	NA	Yes	ASL
	91-20-3	Naphthalene	2.10E-03	J	2.30E+00	J	mg/kg	AMS-SO-10	8 / 19	2.70E-02 - 1.20E+00	2.30E+00	--	3.60E+00	ca	NA	NA	No	BSL
	106-47-8	p-Chloroaniline	1.50E-02	J	1.50E-02	J	mg/kg	AMS-SO-08	1 / 17	-	1.50E-02	--	2.40E+00	ca	NA	NA	No	BSL
	87-86-5	Pentachlorophenol	2.40E-02	J	2.40E-02	J	mg/kg	AMS-SO-03	1 / 16	-	2.40E-02	--	8.90E-01	ca	NA	NA	No	BSL
	85-01-8	Phenanthrene	3.60E-03	J	1.20E+02		mg/kg	FVSS-05A	27 / 27	4.40E-02 - 1.30E+00	1.20E+02	--	1.70E+03	nc	NA	NA	No	BSL
	108-95-2	Phenol	5.70E-03	J	3.50E-01	J	mg/kg	AMS-SO-05	5 / 17	-	3.50E-01	--	1.80E+03	nc	NA	NA	No	BSL
	129-00-0	Pyrene	2.90E-03	J	1.60E+02		mg/kg	FVSS-05A	28 / 28	5.10E-02 - 1.50E+00	1.60E+02	--	1.70E+02	nc	NA	NA	No	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	3.90E-03	B,J	3.90E-03	B,J	mg/kg	01A SB-1	1 / 26	-	3.90E-03	--	5.60E-01	ca	NA	NA	No	BSL
	78-93-3	2-Butanone	6.20E-03	J	1.70E-02		mg/kg	AMS-SO-05	3 / 23	-	1.70E-02	--	2.80E+03	nc	NA	NA	No	BSL
	67-64-1	Acetone	3.70E-03	J	6.90E-02	B	mg/kg	AMS-SO-05	5 / 23	-	6.90E-02	--	6.10E+03	nc	NA	NA	No	BSL
	71-43-2	Benzene	9.80E-04	J	9.80E-04	J	mg/kg	AMS-SO-05	1 / 27	-	9.80E-04	--	1.10E+00	ca	NA	NA	No	BSL
	75-15-0	Carbon Disulfide	3.30E-03	J	3.30E-03	J	mg/kg	AMS-SO-05	1 / 23	-	3.30E-03	--	8.20E+01	nc	NA	NA	No	BSL
	67-66-3	Chloroform	6.40E-04	J	3.40E-03	J	mg/kg	AMS-SO-06	4 / 27	-	3.40E-03	--	2.90E-01	ca	NA	NA	No	BSL
	110-82-7	Cyclohexane	4.60E-04	J	4.60E-04	J	mg/kg	AMS-SO-05	1 / 17	-	4.60E-04	--	1.17E+02	sat	NA	NA	No	BSL
	100-41-4	Ethylbenzene	1.20E-03	J	4.40E-01	J	mg/kg	11A SB-10	3 / 27	-	4.40E-01	--	5.40E+00	ca	NA	NA	No	BSL
	98-82-8	Isopropylbenzene	1.10E-03	J	1.10E-03	J	mg/kg	AMS-SO-05	1 / 17	-	1.10E-03	--	2.10E+02	nc	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.40E-04	J	2.90E-03	J	mg/kg	AMS-SO-05	3 / 17	-	2.90E-03	--	6.30E+01	nc	NA	NA	No	BSL
	108-87-2	Methylcylohexane	2.60E-03	J	2.60E-03	J	mg/kg	AMS-SO-05	1 / 17	-	2.60E-03	--	5.70E+01	nc	NA	NA	No	BSL
	75-09-2	Methylene Chloride	2.30E-02	B	2.10E+00	B,J	mg/kg	11A SB-10	7 / 27	-	2.10E+00	--	3.60E+01	nc	NA	NA	No	BSL
	95-47-6	o-Xylene	1.50E-03	J	1.50E-03	J	mg/kg	AMS-SO-05	1 / 17	-	1.50E-03	--	6.90E+01	nc	NA	NA	No	BSL
	100-42-5	Styrene	1.60E-03	J	3.30E-03	B,J	mg/kg	01A SB-1	2 / 23	-	3.30E-03	--	6.30E+02	nc	NA	NA	No	BSL
	108-88-3	Toluene	1.30E-04	J	8.10E-04	J	mg/kg	AMS-SO-05	9 / 27	-	8.10E-04	--	5.00E+02	nc	NA	NA	No	BSL
	XYLENES	Xylenes, Total	7.00E-01		2.90E+00		mg/kg	10A SB-10	4 / 10	-	2.90E+00	--	6.30E+01	nc	NA	NA	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Residential Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for 'Dichlorobenzene, 1,2-' was used as the SL for 1,3-Dichlorobenzene.
The SL for Diethyl Phthalate was used as the SL for Dimethyl Phthalate.
The SL for 'Hexane, N-' was used as the SL for Methylcylohexane.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Nitrobenzene was used as the SL for 4-Nitrophenol.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for Xylenes was used as the SL for m,p-Xylene.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Below Screening Level (BSL)
Essential Nutrient (NUT)
No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
IEUBK = Integrated Exposure Uptake Biokinetic Model
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
B= Analyte is present in the method blank.
D = Diluted analysis.

TABLE 3.15
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Industrial Worker, Construction Worker)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Min Qual	Maximum Concentration	Max Qual	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
Amcast South Total Soil (0 - 10 ft)	7429-90-5	Aluminum	3.04E+03	J	1.97E+04	J	mg/kg	AMS-SO-07	17 / 17	-	1.97E+04	--	9.90E+04	nc	NA	NA	No	BSL
	7440-38-2	Arsenic	8.30E-01	J	8.20E+00		mg/kg	AMS-SO-04	33 / 33	4.30E-01 - 6.40E-01	8.20E+00	--	2.40E+00	ca	NA	NA	Yes	ASL
	7440-39-3	Barium	2.42E+01		1.94E+02		mg/kg	AMS-SO-07	17 / 17	-	1.94E+02	--	1.90E+04	nc	NA	NA	No	BSL
	7440-41-7	Beryllium	1.90E-01	J	5.40E-01	J	mg/kg	AMS-SO-03	7 / 17	-	5.40E-01	--	2.00E+02	nc	NA	NA	No	BSL
	7440-43-9	Cadmium	1.40E-01	J	2.60E+01		mg/kg	FVSS-06	29 / 34	3.80E-02 - 2.00E-01	2.60E+01	--	8.00E+01	nc	NA	NA	No	BSL
	7440-70-2	Calcium	2.49E+03	J	1.67E+05	J	mg/kg	AMS-SO-05	17 / 17	-	1.67E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	4.60E+00		1.50E+02		mg/kg	FVSS-06	34 / 34	3.30E-02 - 3.50E-01	1.50E+02	--	1.50E+05	nc	NA	NA	No	BSL
	7440-48-4	Cobalt	1.60E+00	J	1.23E+01		mg/kg	AMS-SO-04	16 / 17	-	1.23E+01	--	3.00E+01	nc	NA	NA	No	BSL
	7440-50-8	Copper	1.01E+01		1.59E+03		mg/kg	AMS-SO-07	17 / 17	-	1.59E+03	--	4.10E+03	nc	NA	NA	No	BSL
	7439-89-6	Iron	5.34E+03	J	3.01E+04	J	mg/kg	AMS-SO-04	17 / 17	-	3.01E+04	--	7.20E+04	nc	NA	NA	No	BSL
	7439-92-1	Lead	5.40E+00		1.20E+03		mg/kg	FVSS-06	34 / 34	3.20E-01 - 1.70E+00	1.20E+03	--	8.00E+02	nc	NA	NA	Yes	ASL
	7439-95-4	Magnesium	2.33E+03	J	8.98E+04	J	mg/kg	AMS-SO-04	17 / 17	-	8.98E+04	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	6.96E+01	J	1.20E+03	J	mg/kg	AMS-SO-04	17 / 17	-	1.20E+03	--	2.30E+03	nc	NA	NA	No	BSL
	7439-97-6	Mercury	1.50E-02		6.70E-01		mg/kg	FVSS-06	22 / 34	1.50E-03 - 3.10E-03	6.70E-01	--	3.10E+01	nc	NA	NA	No	BSL
	7440-02-0	Nickel	4.30E+00		3.25E+01		mg/kg	AMS-SO-07	17 / 17	-	3.25E+01	--	2.00E+03	nc	NA	NA	No	BSL
	7440-09-7	Potassium	2.89E+02	J	7.62E+02	J	mg/kg	AMS-SO-04	7 / 17	-	7.62E+02	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	3.54E+02	J	1.08E+03		mg/kg	AMS-SO-02	3 / 17	-	1.08E+03	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	1.06E+01		7.59E+01		mg/kg	AMS-SO-04	17 / 17	-	7.59E+01	--	5.10E+02	nc	NA	NA	No	BSL
	7440-66-6	Zinc	2.99E+01		3.11E+02		mg/kg	AMS-SO-07	17 / 17	-	3.11E+02	--	3.10E+04	nc	NA	NA	No	BSL
	53469-21-9	Aroclor-1242	3.40E-02		9.30E+00		mg/kg	07A SB-3	7 / 27	-	9.30E+00	--	7.40E-01	ca	NA	NA	Yes	ASL
	12672-29-6	Aroclor-1248	3.60E-02	J	4.50E+01	D	mg/kg	AMS-SO-07	19 / 35	2.30E-02 - 4.00E+00	4.50E+01	--	7.40E-01	ca	NA	NA	Yes	ASL
	11097-69-1	Aroclor-1254	6.10E-01		6.10E-01		mg/kg	AMS-SO-01	1 / 27	-	6.10E-01	--	7.40E-01	ca	NA	NA	No	BSL
	PCB(†)	Total PCB (Calc)	3.40E-02		4.50E+01	D	mg/kg	AMS-SO-07	27 / 35	2.30E-02 - 4.00E+00	4.50E+01	--	7.40E-01	ca	NA	NA	Yes	ASL
	92-52-4	1,1'-Biphenyl	1.60E-01	J	1.60E-01	J	mg/kg	AMS-SO-10	1 / 17	-	1.60E-01	--	2.10E+01	nc	NA	NA	No	BSL
	541-73-1	1,3-Dichlorobenzene	3.20E-04	J	3.20E-03	B,J	mg/kg	01A SB-1	2 / 23	-	3.20E-03	--	3.76E+02	sat	NA	NA	No	BSL
	106-46-7	1,4-Dichlorobenzene	6.50E-03	J	6.50E-03	J	mg/kg	AMS-SO-05	1 / 23	-	6.50E-03	--	1.20E+01	ca	NA	NA	No	BSL
	105-67-9	2,4-Dimethylphenol	6.50E-01	J	6.50E-01	J	mg/kg	AMS-SO-05	1 / 17	-	6.50E-01	--	1.20E+03	nc	NA	NA	No	BSL
	91-57-6	2-Methylnaphthalene	1.10E-03	J	2.10E+00		mg/kg	FVSS-05A	12 / 19	4.70E-02 - 1.30E+00	2.10E+00	--	2.20E+02	nc	NA	NA	No	BSL
	106-44-5	4-Methylphenol	3.00E+00		3.00E+00		mg/kg	AMS-SO-05	1 / 17	-	3.00E+00	--	6.20E+03	nc	NA	NA	No	BSL
	83-32-9	Acenaphthene	7.30E-04	J	2.30E+01		mg/kg	FVSS-05A	10 / 19	4.10E-01 - 1.10E+00	2.30E+01	--	3.30E+03	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	1.40E-03	J	1.20E+00		mg/kg	AMS-SO-06	10 / 18	3.70E-02 - 3.70E-02	1.20E+00	--	3.30E+03	nc	NA	NA	No	BSL
	98-86-2	Acetophenone	5.70E-03	J	1.00E-02	J	mg/kg	AMS-SO-02	4 / 17	-	1.00E-02	--	2.52E+03	sat	NA	NA	No	BSL
	120-12-7	Anthracene	7.10E-04	J	2.60E+01		mg/kg	FVSS-05A	20 / 22	2.50E-02 - 7.20E-01	2.60E+01	--	1.70E+04	nc	NA	NA	No	BSL
	100-52-7	Benzaldehyde	9.80E-03	J	1.10E-02	J	mg/kg	AMS-SO-08	2 / 17	-	1.10E-02	--	1.16E+03	sat	NA	NA	No	BSL
	56-55-3	Benzo(a)anthracene	3.10E-03	J	7.10E+01		mg/kg	FVSS-05A	25 / 27	3.50E-02 - 1.00E+00	7.10E+01	--	2.10E+00	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)pyrene	2.90E-03	J	8.00E+01		mg/kg	FVSS-05A	25 / 27	2.70E-02 - 7.90E-01	8.00E+01	--	2.10E-01	ca	NA	NA	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	3.10E-03	J	8.60E+01		mg/kg	FVSS-05A	26 / 27	4.80E-02 - 1.40E+00	8.60E+01	--	2.10E+00	ca	NA	NA	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	1.30E-03	J	6.70E+01		mg/kg	FVSS-05A	22 / 25	5.30E-02 - 1.50E+00	6.70E+01	--	1.70E+03	nc	NA	NA	No	BSL
	207-08-9	Benzo(k)fluoranthene	1.60E-03	J	5.80E+01		mg/kg	FVSS-05A	23 / 25	7.20E-02 - 2.10E+00	5.80E+01	--	2.10E+01	ca	NA	NA	Yes	ASL
	85-68-7	Benzyl Butyl Phthalate	2.40E-01		2.40E-01		mg/kg	FVMW-22	1 / 18	4.90E-02 - 4.90E-02	2.40E-01	--	9.10E+02	ca	NA	NA	No	BSL
	105-60-2	Caprolactam	8.90E-03	J	2.80E-02	J	mg/kg	AMS-SO-02	4 / 17	-	2.80E-02	--	3.10E+04	nc	NA	NA	No	BSL
	86-74-8	Carbazole	6.50E-03	J	1.40E+01		mg/kg	FVSS-05A	8 / 19	4.20E-01 - 1.20E+00	1.40E+01	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	1.80E-03	J	7.80E+01		mg/kg	FVSS-05A	27 / 27	5.40E-02 - 1.60E+00	7.80E+01	--	2.10E+02	ca	NA	NA	No	BSL
	53-70-3	Dibenzo(a,h)anthracene	1.00E-03	J	1.40E+01		mg/kg	FVSS-05A	18 / 21	4.00E-02 - 1.10E+00	1.40E+01	--	2.10E-01	ca	NA	NA	Yes	ASL
	132-64-9	Dibenzofuran	1.80E-02	J	1.50E+01		mg/kg	FVSS-05A	6 / 19	4.70E-01 - 1.30E+00	1.50E+01	--	1.00E+02	nc	NA	NA	No	BSL
	84-66-2	Diethyl Phthalate	4.30E-02	J	5.10E-02		mg/kg	FVSB-8	2 / 18	4.30E-02 - 4.30E-02	5.10E-02	--	4.90E+04	nc	NA	NA	No	BSL
	131-11-3	Dimethyl Phthalate	6.00E-03	J	2.00E-02	J	mg/kg	AMS-SO-02	5 / 17	-	2.00E-02	--	4.90E+04	nc	NA	NA	No	BSL
	84-74-2	Di-n-butylphthalate	6.70E-03	J	1.60E+00	J	mg/kg	AMS-SO-01	9 / 19	4.70E-02 - 5.00E-02	1.60E+00	--	6.20E+03	nc	NA	NA	No	BSL

TABLE 3.15
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil (0-10 feet) (Industrial Worker, Construction Worker)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (3)
	206-44-0	Fluoranthene	2.40E-03	J	1.10E+02		mg/kg	FVSS-05A	27 / 28	3.80E-02 - 1.10E+00	1.10E+02	--	2.20E+03	nc	NA	NA	No	BSL
	86-73-7	Fluorene	1.00E-03	J	2.50E+01		mg/kg	FVSS-05A	11 / 19	4.40E-01 - 1.20E+00	2.50E+01	--	2.20E+03	nc	NA	NA	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.80E-03	J	7.80E+01		mg/kg	FVSS-05A	22 / 23	8.60E-02 - 2.50E+00	7.80E+01	--	2.10E+00	ca	NA	NA	Yes	ASL
	91-20-3	Naphthalene	2.10E-03	J	2.30E+00	J	mg/kg	AMS-SO-10	8 / 19	2.70E-02 - 1.20E+00	2.30E+00	--	1.80E+01	ca	NA	NA	No	BSL
	106-47-8	p-Chloroaniline	1.50E-02	J	1.50E-02	J	mg/kg	AMS-SO-08	1 / 17	-	1.50E-02	--	8.60E+00	ca	NA	NA	No	BSL
	87-86-5	Pentachlorophenol	2.40E-02	J	2.40E-02	J	mg/kg	AMS-SO-03	1 / 16	-	2.40E-02	--	2.70E+00	ca	NA	NA	No	BSL
	85-01-8	Phenanthrene	3.60E-03	J	1.20E+02		mg/kg	FVSS-05A	27 / 27	4.40E-02 - 1.30E+00	1.20E+02	--	1.70E+04	nc	NA	NA	No	BSL
	108-95-2	Phenol	5.70E-03	J	3.50E-01	J	mg/kg	AMS-SO-05	5 / 17	-	3.50E-01	--	1.80E+04	nc	NA	NA	No	BSL
	129-00-0	Pyrene	2.90E-03	J	1.60E+02		mg/kg	FVSS-05A	28 / 28	5.10E-02 - 1.50E+00	1.60E+02	--	1.70E+03	nc	NA	NA	No	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	3.90E-03	B,J	3.90E-03	B,J	mg/kg	01A SB-1	1 / 26	-	3.90E-03	--	2.80E+00	ca	NA	NA	No	BSL
	78-93-3	2-Butanone	6.20E-03	J	1.70E-02		mg/kg	AMS-SO-05	3 / 23	-	1.70E-02	--	2.00E+04	nc	NA	NA	No	BSL
	67-64-1	Acetone	3.70E-03	J	6.90E-02	B	mg/kg	AMS-SO-05	5 / 23	-	6.90E-02	--	6.30E+04	nc	NA	NA	No	BSL
	71-43-2	Benzene	9.80E-04	J	9.80E-04	J	mg/kg	AMS-SO-05	1 / 27	-	9.80E-04	--	5.40E+00	ca	NA	NA	No	BSL
	75-15-0	Carbon Disulfide	3.30E-03	J	3.30E-03	J	mg/kg	AMS-SO-05	1 / 23	-	3.30E-03	--	3.70E+02	nc	NA	NA	No	BSL
	67-66-3	Chloroform	6.40E-04	J	3.40E-03	J	mg/kg	AMS-SO-06	4 / 27	-	3.40E-03	--	1.50E+00	ca	NA	NA	No	BSL
	110-82-7	Cyclohexane	4.60E-04	J	4.60E-04	J	mg/kg	AMS-SO-05	1 / 17	-	4.60E-04	--	1.17E+02	sat	NA	NA	No	BSL
	100-41-4	Ethylbenzene	1.20E-03	J	4.40E-01	J	mg/kg	11A SB-10	3 / 27	-	4.40E-01	--	2.70E+01	ca	NA	NA	No	BSL
	98-82-8	Isopropylbenzene	1.10E-03	J	1.10E-03	J	mg/kg	AMS-SO-05	1 / 17	-	1.10E-03	--	2.68E+02	sat	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	1.40E-04	J	2.90E-03	J	mg/kg	AMS-SO-05	3 / 17	-	2.90E-03	--	2.58E+02	sat	NA	NA	No	BSL
	108-87-2	Methylcylohexane	2.60E-03	J	2.60E-03	J	mg/kg	AMS-SO-05	1 / 17	-	2.60E-03	--	1.41E+02	sat	NA	NA	No	BSL
	75-09-2	Methylene Chloride	2.30E-02	B	2.10E+00	B,J	mg/kg	11A SB-10	7 / 27	-	2.10E+00	--	3.10E+02	nc	NA	NA	No	BSL
	95-47-6	o-Xylene	1.50E-03	J	1.50E-03	J	mg/kg	AMS-SO-05	1 / 17	-	1.50E-03	--	3.00E+02	nc	NA	NA	No	BSL
	100-42-5	Styrene	1.60E-03	J	3.30E-03	B,J	mg/kg	01A SB-1	2 / 23	-	3.30E-03	--	8.67E+02	sat	NA	NA	No	BSL
	108-88-3	Toluene	1.30E-04	J	8.10E-04	J	mg/kg	AMS-SO-05	9 / 27	-	8.10E-04	--	8.18E+02	sat	NA	NA	No	BSL
	XYLENES	Xylenes, Total	7.00E-01		2.90E+00		mg/kg	10A SB-10	4 / 10	-	2.90E+00	--	2.58E+02	sat	NA	NA	No	BSL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Industrial Soil (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for 'Chromium(III)' was used as the SL for Chromium.
The SL for 'Dichlorobenzene, 1,2-' was used as the SL for 1,3-Dichlorobenzene.
The SL for Diethyl Phthalate was used as the SL for Dimethyl Phthalate.
The SL for 'Hexane, N-' was used as the SL for Methylcylohexane.
The SL for 'Mercuric Chloride (and other Mercury salts)' was used as the SL for Mercury.
The SL for Nitrobenzene was used as the SL for 4-Nitrophenol.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and compounds' was used as the SL for Vanadium.
The SL for Xylenes was used as the SL for m,p-Xylene.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(3) Rationale Codes

Selection Reason:
- Above Screening Levels (ASL)

Deletion Reason:
- Below Screening Level (BSL)
- Essential Nutrient (NUT)
- No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
ALM= Adult Lead Methodology
csat = Saturation Concentration
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
B= Analyte is present in the method blank.
D = Diluted analysis.

TABLE 3.16
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Residential, Industrial Worker)

Exposure Point	CAS Number	Chemical	Minimum Concentration	Minimum Concentration Qualifier	Maximum Concentration	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value (3)	Potential ARAR/TBC Source (3)	COPC Flag	Rationale for Selection or Deletion (4)
Tapwater	7440-38-2	Arsenic, Dissolved	1.00E+01		8.90E+01		ug/L	GMMW-3	2 / 2	3.40E+00 - 3.40E+00	8.90E+01	--	4.5E-02	ca	1	PAL	Yes	ASL (both)
	7440-47-3	Chromium, Dissolved	1.00E+00		4.60E+01		ug/L	FVMW-21	16 / 16	9.20E-01 - 9.20E-01	4.60E+01	--	3.1E-02	ca	10	PAL	Yes	ASL
	7439-92-1	Lead, Dissolved	1.80E+00		3.80E+00		ug/L	GMMW-5	15 / 15	1.60E+00 - 1.60E+00	3.80E+00	--	1.5E+01	AL	1.5	PAL	No	BSL
	7440-38-2	Arsenic	4.90E-01	J	6.10E+01		ug/L	GMMW-3	20 / 21	3.40E+00 - 3.40E+00	6.10E+01	--	4.5E-02	ca	1	PAL	Yes	ASL
	7440-39-3	Barium	4.76E+01		2.10E+02		ug/L	AMS-MW01/01	14 / 14	-	2.10E+02	--	2.9E+02	nc	400	PAL	No	BSL
	7440-43-9	Cadmium	6.00E-01		9.70E-01		ug/L	GMMW-4	4 / 18	4.80E-01 - 4.80E-01	9.70E-01	--	6.9E-01	nc	0.5	PAL	Yes	ASL
	7440-70-2	Calcium	2.11E+04		1.50E+05		ug/L	AMQ-FVMW-24/01	14 / 14	-	1.50E+05	--	NUT	-	NA	NA	No	NUT
	7440-47-3	Chromium	9.70E-01		3.72E+02		ug/L	AMN-MW01/01	33 / 34	9.20E-01 - 9.20E-01	3.72E+02	--	3.1E-02	ca	10	PAL	Yes	ASL
	7440-48-4	Cobalt	1.00E+00	J	7.60E+00		ug/L	AMS-MW01/01	4 / 14	-	7.60E+00	--	4.7E-01	nc	8	PAL	Yes	ASL
	7440-50-8	Copper	1.40E+00	J	4.60E+00		ug/L	AMS-FVMW-20/01	9 / 14	-	4.60E+00	--	6.2E+01	nc	130	PAL	No	BSL
	7439-89-6	Iron	7.85E+02		1.97E+04		ug/L	AMQ-FVMW-24/01	6 / 14	-	1.97E+04	--	1.1E+03	nc	NA	NA	Yes	ASL
	7439-92-1	Lead	1.60E+00		8.00E+01		ug/L	GMMW-4	19 / 33	1.60E+00 - 1.60E+00	8.00E+01	--	1.5E+01	AL	1.5	PAL	Yes	ASL
	7439-95-4	Magnesium	1.61E+04		2.03E+05		ug/L	AMS-GMMW-3/01	14 / 14	-	2.03E+05	--	NUT	-	NA	NA	No	NUT
	7439-96-5	Manganese	9.60E-01	J	1.12E+03	D	ug/L	AMS-MW01/01	12 / 14	-	1.12E+03	--	3.2E+01	nc	60	PAL	Yes	ASL
	7440-02-0	Nickel	9.20E-01	J	1.35E+01		ug/L	AMS-MW01/01	14 / 14	-	1.35E+01	--	3.0E+01	nc	20	PAL	No	BSL
	7440-09-7	Potassium	3.36E+03	J	2.00E+04		ug/L	AMS-GMMW-3/01	8 / 14	-	2.00E+04	--	NUT	-	NA	NA	No	NUT
	7440-23-5	Sodium	2.86E+04		3.57E+05		ug/L	AMS-GMMW-2/01	14 / 14	-	3.57E+05	--	NUT	-	NA	NA	No	NUT
	7440-62-2	Vanadium	2.80E+00	J	1.76E+01		ug/L	AMN-MW01/01	5 / 14	-	1.76E+01	--	6.3E+00	nc	6	PAL	Yes	ASL
	7440-66-6	Zinc	1.40E+00	J	5.77E+02		ug/L	AMN-FVMW-27/01	13 / 14	-	5.77E+02	--	4.7E+02	nc	NA	NA	Yes	ASL
	12672-29-6	Aroclor-1248	2.90E-01		1.60E+00		ug/L	GMMW-3	5 / 18	2.40E-01 - 2.40E-01	1.60E+00	--	3.4E-02	ca	0.003	PAL	Yes	ASL
	11096-82-5	Aroclor-1260	4.80E-01		1.40E+00		ug/L	FVMW-24	2 / 16	2.40E-01 - 2.50E-01	1.40E+00	--	3.4E-02	ca	0.003	PAL	Yes	ASL
	PCB(†)	Total PCB (Calc)	3.00E-01		1.69E+00		ug/L	FVMW-24	6 / 19	2.40E-01 - 2.50E-01	1.69E+00	--	0.0E+00	--	0.003	PAL	Yes	ASL
	92-52-4	1,1'-Biphenyl	5.40E+00		5.40E+00		ug/L	AMS-GMMW-3/01	1 / 14	-	5.40E+00	--	8.3E-02	nc	NA	NA	Yes	ASL
	105-67-9	2,4-Dimethylphenol	4.80E-01	J	4.80E-01	J	ug/L	AMS-GMMW-3/01	1 / 14	-	4.80E-01	--	2.7E+01	nc	NA	NA	No	BSL
	91-57-6	2-Methylnaphthalene	1.00E-02	J	1.00E-02	J	ug/L	AMS-GMMW-6/01	1 / 14	-	1.00E-02	--	2.7E+00	nc	NA	NA	No	BSL
	95-48-7	2-Methylphenol	3.10E-01	J	3.10E-01	J	ug/L	AMS-GMMW-3/01	1 / 14	-	3.10E-01	--	7.2E+01	nc	NA	NA	No	BSL
	83-32-9	Acenaphthene	1.00E-02	J	1.20E+01		ug/L	GMMW-3	6 / 16	2.10E+00 - 2.20E+00	1.20E+01	--	4.0E+01	nc	NA	NA	No	BSL
	208-96-8	Acenaphthylene	4.00E-02	J	7.70E-01	J	ug/L	AMS-GMMW-3/01	3 / 14	-	7.70E-01	--	4.0E+01	nc	NA	NA	No	BSL
	120-12-7	Anthracene	2.00E-02	J	3.70E-01		ug/L	AMQ-FVMW-24/01	6 / 14	-	3.70E-01	--	1.3E+02	nc	600	PAL	No	BSL
	56-55-3	Benzo(a)anthracene	2.00E-02	J	1.20E+01		ug/L	GMMW-4	5 / 16	2.20E+00 - 2.40E+00	1.20E+01	--	2.9E-02	ca	NA	NA	Yes	ASL
	50-32-8	Benzo(a)pyrene	8.00E-02	J	1.90E+01		ug/L	GMMW-4	3 / 16	2.70E+00 - 2.80E+00	1.90E+01	--	2.9E-03	ca	0.02	PAL	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	1.90E-01		2.80E+01		ug/L	GMMW-4	3 / 16	2.90E+00 - 3.00E+00	2.80E+01	--	2.9E-02	ca	0.02	PAL	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	1.00E-01	J	1.90E+01		ug/L	GMMW-4	3 / 16	3.30E+00 - 3.50E+00	1.90E+01	--	8.7E+00	nc	NA	NA	Yes	ASL
	207-08-9	Benzo(k)fluoranthene	5.00E-02	J	2.40E+01		ug/L	GMMW-4	3 / 16	2.30E+00 - 2.40E+00	2.40E+01	--	2.9E-01	ca	NA	NA	Yes	ASL
	117-81-7	Bis(2-ethylhexyl)phthalate	5.10E+00		7.30E+02		ug/L	GMMW-3	10 / 24	4.00E+00 - 4.00E+01	7.30E+02	--	4.8E+00	ca	0.6	PAL	Yes	ASL
	105-60-2	Caprolactam	1.70E-01	J	3.50E+00	J	ug/L	AMQ-FVMW-24/01	8 / 14	-	3.50E+00	--	7.7E+02	nc	NA	NA	No	BSL
	86-74-8	Carbazole	2.00E-01	J	5.20E+00		ug/L	AMS-GMMW-3/01	6 / 18	1.80E+00 - 1.90E+00	5.20E+00	--	NA	-	NA	NA	No	NTX
	218-01-9	Chrysene	2.00E-02	J	2.70E+01		ug/L	GMMW-4	5 / 16	2.10E+00 - 2.20E+00	2.70E+01	--	2.9E+00	ca	0.02	PAL	Yes	ASL
	53-70-3	Dibenzo(a,h)anthracene	1.00E-02	J	1.00E-02	J	ug/L	AMS-GMMW-4/01	1 / 14	-	1.00E-02	--	2.9E-03	ca	NA	NA	Yes	ASL
	132-64-9	Dibenzofuran	2.50E+00	J	7.10E+00		ug/L	GMMW-3	4 / 16	1.60E+00 - 1.70E+00	7.10E+00	--	5.8E-01	nc	NA	NA	Yes	ASL
	84-74-2	Di-n-butylphthalate	1.50E-01	J	4.70E-01	J	ug/L	AMS-MW01/01	8 / 14	-	4.70E-01	--	6.7E+01	nc	100	PAL	No	BSL
	206-44-0	Fluoranthene	3.00E-02	J	5.00E+01		ug/L	GMMW-4	6 / 16	2.10E+00 - 2.20E+00	5.00E+01	--	6.3E+01	nc	80	PAL	No	BSL
	86-73-7	Fluorene	3.90E+00		1.30E+01		ug/L	GMMW-3	4 / 16	1.90E+00 - 2.00E+00	1.30E+01	--	2.2E+01	nc	80	PAL	No	BSL
	67-72-1	Hexachloroethane	1.70E+01		1.70E+01		ug/L	AMS-GMMW-3/01	1 / 14	-	1.70E+01	--	5.1E-01	nc	NA	NA	Yes	ASL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.20E-01		2.10E+01		ug/L	GMMW-4	3 / 16	3.40E+00 - 3.50E+00	2.10E+01	--	2.9E-02	ca	NA	NA	Yes	ASL
	91-20-3	Naphthalene	1.00E-02	J	1.70E+01		ug/L	GMMW-3	6 / 18	7.40E-01 - 2.70E+00	1.70E+01	--	1.4E-01	ca	10	PAL	Yes	ASL
	87-86-5	Pentachlorophenol	1.00E-02	J	1.80E-01	J	ug/L	AMS-GMMW-6/01	9 / 13	-	1.80E-01	--	3.5E-02	ca	0.1	PAL	Yes	ASL
	85-01-8	Phenanthrene	2.90E+00	B	1.70E+01		ug/L	GMMW-4	4 / 17	2.10E+00 - 2.20E+00	1.70E+01	--	1.3E+02	nc	NA	NA	No	BSL
	129-00-0	Pyrene	2.00E-02	J	3.60E+01		ug/L	GMMW-4	6 / 16	2.40E+00 - 2.50E+00	3.60E+01	--	8.7E+00	nc	50	PAL	Yes	ASL

TABLE 3.16
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater (Residential, Industrial Worker)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value	Screening Toxicity Value (2)		Potential ARAR/TBC Value (3)	Potential ARAR/TBC Source (3)	COPC Flag	Rationale for Selection or Deletion (4)
	95-63-6	1,2,4-Trimethylbenzene	5.00E+01	5.80E+01	ug/L	GMMW-3	2 / 2	9.70E-01 - 9.70E-01	5.80E+01	--	1.5E+00	nc	96	PAL	Yes	ASL
	107-06-2	1,2-Dichloroethane	1.10E-01 J	1.10E-01 J	ug/L	AMN-MW01/01	1 / 14	-	1.10E-01	--	1.5E-01	ca	0.5	PAL	No	BSL
	78-87-5	1,2-Dichloropropane	5.50E-01	5.50E-01	ug/L	AMN-MW01/01	1 / 14	-	5.50E-01	--	3.8E-01	ca	0.5	PAL	Yes	ASL
	78-93-3	2-Butanone	2.00E-01 J	2.00E-01 J	ug/L	AMN-MW01/01	1 / 14	-	2.00E-01	--	4.9E+02	nc	800	PAL	No	BSL
	591-78-6	2-Hexanone	2.40E+00 J	2.40E+00 J	ug/L	AMN-MW01/01	1 / 14	-	2.40E+00	--	3.4E+00	nc	NA	NA	No	BSL
	71-43-2	Benzene	1.40E+00	3.80E+00	ug/L	GMMW-3	3 / 16	4.10E-01 - 4.10E-01	3.80E+00	--	3.9E-01	ca	0.5	PAL	Yes	ASL
	75-27-4	Bromodichloromethane	1.10E+00	1.40E+00	ug/L	GMMW-1	3 / 16	5.60E-01 - 5.60E-01	1.40E+00	--	1.2E-01	ca	0.06	PAL	Yes	ASL
	67-66-3	Chloroform	1.00E+00	1.10E+00	ug/L	GMMW-1	2 / 16	3.70E-01 - 3.70E-01	1.10E+00	--	1.9E-01	ca	0.6	PAL	Yes	ASL
	10061-01-5	cis-1,3-Dichloropropene	2.00E-01 J	2.00E-01 J	ug/L	AMN-MW01/01	1 / 14	-	2.00E-01	--	4.1E-01	ca	0.04	PAL	No	BSL
	100-41-4	Ethylbenzene	6.70E-01	3.10E+01 D	ug/L	AMS-GMMW-3/01	8 / 21	5.40E-01 - 5.40E-01	3.10E+01	--	1.3E+00	ca	140	PAL	Yes	ASL
	98-82-8	Isopropylbenzene	5.60E+00	6.30E+00	ug/L	AMS-GMMW-3/01	3 / 16	5.90E-01 - 5.90E-01	6.30E+00	--	3.9E+01	nc	NA	NA	No	BSL
	179601-23-1	m,p-Xylene	9.00E-02 J	2.00E+01	ug/L	GMMW-2, GMMW-3	11 / 23	1.80E+00 - 1.80E+00	2.00E+01	--	1.9E+01	nc	400	PAL	Yes	ASL
	108-87-2	Methylcylohexane	2.40E+00	2.40E+00	ug/L	AMS-GMMW-3/01	1 / 14	-	2.40E+00	--	2.5E+01	nc	NA	NA	No	BSL
	103-65-1	n-Propylbenzene	7.50E+00	7.70E+00	ug/L	GMMW-3	2 / 2	8.10E-01 - 8.10E-01	7.70E+00	--	5.3E+01	nc	NA	NA	No	BSL
	95-47-6	o-Xylene	9.30E-01	1.30E+01	ug/L	GMMW-3	10 / 23	8.30E-01 - 8.30E-01	1.30E+01	--	1.9E+01	nc	400	PAL	No	BSL
	108-88-3	Toluene	6.70E-01	1.90E+00	ug/L	GMMW-3	3 / 16	6.70E-01 - 6.70E-01	1.90E+00	--	8.6E+01	nc	160	PAL	No	BSL
	10061-02-6	trans-1,3-Dichloropropene	1.30E-01 J	1.30E-01 J	ug/L	AMN-MW01/01	1 / 14	-	1.30E-01	--	4.1E-01	ca	0.04	PAL	No	BSL
	79-01-6	Trichloroethylene	1.40E-01 J	4.50E+00	ug/L	FVMW-20	5 / 16	4.80E-01 - 4.80E-01	4.50E+00	--	2.6E-01	nc	0.5	PAL	Yes	ASL

(1) Maximum detected concentration is used for screening.

(2) Regional Screening Levels for Tap Water (May 2013). Concentrations based on non-carcinogenic health effects are adjusted using HQ=0.1.

(3) Table 1 - Public Health Groundwater Quality Standards - Preventive Action Limit (PAL) - NR 140.10

The SL for Acenaphthene was used as the SL for Acenaphthylene.
The SL for Anthracene was used as the SL for Phenanthrene.
The SL for Chromium(VI) was used as the SL for total and dissolved Chromium.
The SL for 'Dichloropropene, 1,3-' was used as the SL for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene.
The SL for 'Hexane, N-' was used as the SL for Methylcylohexane.
The SL for Pyrene was used as the SL for Benzo(g,h,i)perylene.
The SL for 'Vanadium and Compound's was used as the SL for Vanadium.
The SL for Xylenes was used as the SL for m,p-Xylene.

PCB(†) = Total PCBs were calculated for all samples. Individual Aroclors are displayed when they are available. Historic samples for some media were not analyzed for individual Aroclors and were reported as "Total PCB". These samples are included in the "Total PCB (Calc)" data.

(4) Rationale Codes

Selection Reason: Above Screening Levels (ASL)
-Both - Exceeds the RSL and PAL
-or RSL - Exceeds the RSL, PAL - Exceeds the AL

Deletion Reason: Below Screening Level (BSL)
No Toxicity Value (NTX)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

ca = Carcinogenic
nc = Noncarcinogenic .
NA = Not available
SL = Screening Level
HQ = Hazard Quotient
AL = Action Level
J = Concentration detected equal to or greater than the method detection limit but less than the reporting limit.
B= Analyte is present in the method blank.
D = Diluted analysis.

TABLE 4

SELECTION OF EXPOSURE PATHWAYS

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age (1)	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Soil	Surface Soil (0-2 ft)	Amcast North and Amcast South Surface Soil (0 - 2 ft)(1)	Trespasser	Adolescent	Dermal, Ingestion	On-site	Quant	Trespassers may contact surface soil.
		Ambient Air	Amcast North and Amcast South Emissions from Surface Soil (1)	Trespasser	Adolescent	Inhalation	On-site	Quant	Trespassers may inhale dust and volatile constituents from surface soil .
Current/Future	Soil	Surface Soil (0-6 in)	Zeunert Park, and Quarry Pond and Wilshire Pond Bank Surface Soil (0 - 6 in) (2)	Recreational User	Adult, Child	Dermal, Ingestion	On-site	Quant	Recreators may contact surface soil at Zeunert Park and on the banks of the ponds.
		Surface Soil (0-2 ft)	Residential Area Surface Soil (0-2 ft)(3)	Resident	Adult, Child	Dermal, Ingestion	Off-site	Qual	Residents may contact surface soil.
		Ambient Air	Zeunert Park, Quarry Pond and Wilshire Pond Emissions from Surface Soil (2)	Recreational User	Adult, Child	Inhalation	On-site	Quant	Recreators may inhale dust and volatile constituents from surface soil on the bank of the ponds.
			Residential Area Emissions from Surface Soil (3)	Resident	Adult, Child	Inhalation	Off-site	Qual	Residents may inhale dust and volatile constituents from surface soil.
	Surface Water	Surface Water	Quarry Pond and Wilshire Pond Surface Water (2)	Recreational User	Adult, Child	Dermal, Ingestion	On-site	Quant	Recreators may contact surface water in ponds while swimming and wading.
			Amcast North and Amcast South Storm Sewer Surface Water (1)	Utility Worker	Adult	None	On-site	None	Potential exposures to surface water in storm sewers by utility workers are considered negligible; therefore, this pathway is not quantified in the risk assessment .
	Sediment	Sediment	Quarry Pond and Wilshire Pond Sediment (2)	Recreational User	Adult, Child	Dermal, Ingestion	On-site	Quant	Recreators may contact sediment in ponds while swimming and wading.
			Amcast North and Amcast South Storm Sewer Sediment (1)	Utility Worker	Adult	None	On-site	None	Potential exposures to sediment in storm sewers by utility workers are considered negligible; therefore, this pathway is not quantified in the risk assessment .
	Fish	Fish	Quarry Pond Fish Fillets Bottom Feeders and Suspended Feeders (5)	Recreational Angler	Adult, Child	Ingestion	On-site	Quant	Recreators may consume fish caught from the Quarry Pond.
Future	Soil	Total Soil (0-10 ft)	Amcast North and Amcast South Total Soil (0 - 10 ft) (1)	Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Residents may contact total soil.
				Industrial Worker	Adult	Dermal, Ingestion	On-site	Quant	Industrial workers may contact total soil.
				Construction Worker	Adult	Dermal, Ingestion	On-site	Quant	Construction workers may contact total soil.
		Ambient Air	Amcast North and Amcast South Emissions from Total Soil (1)	Resident	Adult, Child	Inhalation	On-site	Quant	Residents may inhale dust and volatile constituents from surface soil and disturbed total soil.
				Industrial Worker	Adult	Inhalation	On-site	Quant	Industrial workers may inhale dust and volatile constituents from total soil.
				Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers may inhale dust and volatile constituents from total soil.
	Groundwater (4)	Groundwater	Tapwater	Resident	Adult, Child	Dermal, Ingestion	On-site	Quant	Residents may contact groundwater through potable use.
				Industrial Worker	Adult	Dermal, Ingestion	On-site	Quant	Industrial workers may contact groundwater through potable use.
		Bathroom Air	Water Vapors in Bathroom Air	Resident	Adult, Child	Inhalation	On-site	Quant	Residents may inhale volatile groundwater constituents during showering.
		Indoor Air	Indoor Air	Industrial Worker	Adult	Inhalation	On-site	Quant	Industrial workers may inhale volatile groundwater constituents that have migrated to indoor air through vapor intrusion.
				Resident	Adult, Child	Inhalation	On-site	Quant	Residents may inhale volatile groundwater constituents that have migrated to indoor air through vapor intrusion.

Notes:

(1) Amcast North and Amcast South will be evaluated separately in the HHRA.

(2) Zeunert Park and the banks of the Quarry Pond will be evaluated together. Wilshire Pond will be evaluated separately in the HHRA.

(3) Area adjacent to Amcast North. Residential properties will be evaluated individually in the HHRA. For off-site properties, risks will not be quantified; however, PCB concentrations will be compared to the TSCA soil cleanup level of 1 ppm for unrestricted access.

(4) Groundwater from the Amcast North and Amcast South were evaluated as one exposure unit for potential future residential and industrial worker exposures.

(5) Fish fillet data will be used to assess ingestion of fish.

PCB - Polychlorinated biphenyl

ppm - parts per million

TSCA - Toxic Substances Control Act

Quant - Quantitative

Qual - Qualitative

TABLE 5.1
CANCER TOXICITY DATA -- ORAL/DERMAL
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1'-Biphenyl	8.0E-03	$(mg/kg\text{-}day)^{-1}$	>50%	8.0E-03	$(mg/kg\text{-}day)^{-1}$	(7)	IRIS	8/27/2013
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	3.6E-02	$(mg/kg\text{-}day)^{-1}$	>50%	3.6E-02	$(mg/kg\text{-}day)^{-1}$	NA	Cal/EPA (RSL)	5/2013
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	2.0E+00	$(mg/kg\text{-}day)^{-1}$	80 - 96%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS (RSL)	5/2013
Aroclor-1248	2.0E+00	$(mg/kg\text{-}day)^{-1}$	80 - 96%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS (RSL)	5/2013
Aroclor-1254	2.0E+00	$(mg/kg\text{-}day)^{-1}$	80 - 96%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS (RSL)	5/2013
Aroclor-1260	2.0E+00	$(mg/kg\text{-}day)^{-1}$	80 - 96%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS (RSL)	5/2013
Arsenic	1.5E+00	$(mg/kg\text{-}day)^{-1}$	95%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	8/21/2013
Benzene	5.5E-02	$(mg/kg\text{-}day)^{-1}$	>50%	5.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	8/21/2013
Benzo(a)anthracene (3)	7.3E-01	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (RSL)	5/2013
Benzo(a)pyrene (3)	7.3E+00	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	8/21/2013
Benzo(b)fluoranthene (3)	7.3E-01	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (RSL)	5/2013
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	7.3E-02	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E-02	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (RSL)	5/2013
Bis(2-ethylhexyl)phthalate	1.4E-02	$(mg/kg\text{-}day)^{-1}$	>50%	1.4E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	8/21/2013
Bromodichloromethane	6.2E-02	$(mg/kg\text{-}day)^{-1}$	>50%	6.2E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	8/21/2013
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	3.1E-02	$(mg/kg\text{-}day)^{-1}$	>50%	3.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Chromium (III)	NA	NA	NA	NA	NA	D	IRIS	8/21/2013
Chromium (VI) (3)	5.0E-01	$(mg/kg\text{-}day)^{-1}$	2.5%	2.0E+01	$(mg/kg\text{-}day)^{-1}$	D	NJ (RSL)	5/2013
Chrysene (3)	7.3E-03	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (RSL)	5/2013
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	D	IRIS	8/21/2013
Dibenzo(a,h)anthracene (3)	7.3E+00	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (RSL)	5/2013
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	1.1E-02	$(mg/kg\text{-}day)^{-1}$	>50%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	D	Cal/EPA (RSL)	5/2013
Hexachloroethane	4.0E-02	$(mg/kg\text{-}day)^{-1}$	>50%	4.0E-02	$(mg/kg\text{-}day)^{-1}$	(5)	IRIS	8/21/2013
Indeno(1,2,3-cd)pyrene (3)	7.3E-01	$(mg/kg\text{-}day)^{-1}$	58-89%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	ECAO (RSL)	5/2013
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	B2	IRIS	8/21/2013
Manganese	NA	NA	NA	NA	NA	D	IRIS	8/21/2013
Naphthalene	NA	NA	NA	NA	NA	C	IRIS	8/21/2013
Pentachlorophenol	4.0E-01	$(mg/kg\text{-}day)^{-1}$	>50%	4.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	8/21/2013
Pyrene	NA	NA	NA	NA	NA	D	IRIS	8/21/2013
Total PCB (Calc)	2.0E+00	(mg/kg-day)-1	80 - 96%	2.0E+00	(mg/kg-day)-1	B2	IRIS (RSL)	5/1/2013
Trichloroethylene (Kidney)	9.3E-03	$(mg/kg\text{-}day)^{-1}$	>50%	9.3E-03	$(mg/kg\text{-}day)^{-1}$	(4)	IRIS	8/21/2013

TABLE 5.1
CANCER TOXICITY DATA -- ORAL/DERMAL
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Trichloroethylene (NHL+Liver)	3.7E-02	$(mg/kg\text{-}day)^{-1}$	>50%	3.7E-02	$(mg/kg\text{-}day)^{-1}$	(4)	IRIS	8/21/2013
Trichloroethylene(4)	4.6E-02	$(mg/kg\text{-}day)^{-1}$	>50%	4.6E-02	$(mg/kg\text{-}day)^{-1}$	(6)	IRIS	8/21/2013
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, m&p	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA

Note:
Total PCB (Calc) will be used to evaluate risk from PCBs in the HHRA. The toxicity value for Aroclor-1248 will be used to represent cancer risk.

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of >50%.

Definitions:
NA = Not Available
ECAO = Environmental Criteria and Assessment Office
IRIS = Integrated Risk Information System
NJ = New Jersey Department of Environmental Protection
RSL = As cited in EPA Regional Screening Level Table

(2) Adjusted based on RAGS Part E.

(3) This chemical operates with a mutagenic mode of action.
USEPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

AGE	AGE ADAF
0-<2	10
2-<16	3
16-<30	1

(4) EPA has concluded, by a weight of evidence evaluation, that TCE is carcinogenic by a mutagenic mode of action for induction of kidney tumors. As a result, increased early-life susceptibility is assumed for kidney cancer and the age-dependent adjustment factors (ADAFs) were used for the kidney cancer component of the total cancer risk when estimating age-specific cancer risks. Cancer risk estimates will also account for non-Hodgkins Lymphoma (NHL) and liver contribution.

(5) Likely to be carcinogenic to humans

(6) Carcinogenic to humans

(7) Suggestive evidence of carcinogenic potential

Weight of Evidence definitions:

Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.

Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.

Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.

Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.

Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

Group E chemicals (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

TABLE 5.2
CANCER TOXICITY DATA -- INHALATION
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
1,1'-Biphenyl	NA	NA	(6)	NA	NA
1,2,4-Trimethylbenzene	NA	NA	NA	NA	NA
1,2-Dichloropropane	1.0E-05	$(ug/m^3)^{-1}$	NA	Cal/EPA (RSL)	5/2013
Aluminum	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA
Aroclor-1242	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (RSL)	5/2013
Aroclor-1248	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (RSL)	5/2013
Aroclor-1254	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (RSL)	5/2013
Aroclor-1260	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (RSL)	5/2013
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	A	IRIS	8/21/2013
Benzene	7.8E-06	$(ug/m^3)^{-1}$	A	IRIS	8/21/2013
Benzo(a)anthracene (1)	1.1E-04	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Benzo(a)pyrene (1)	1.1E-03	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Benzo(b)fluoranthene (1)	1.1E-04	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1.1E-04	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Bis(2-ethylhexyl)phthalate	2.4E-06	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Bromodichloromethane	3.7E-05	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Cadmium	1.8E-03	$(ug/m^3)^{-1}$	B1	IRIS	8/21/2013
Chloroform	2.3E-05	$(ug/m^3)^{-1}$	B2	IRIS	8/21/2013
Chromium (III)	NA	NA	D	IRIS	8/21/2013
Chromium (VI) (1), (5)	8.4E-02	$(ug/m^3)^{-1}$	A	IRIS (RSL)	5/2013
Chrysene (1)	1.1E-05	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Cobalt	9.0E-03	$(ug/m^3)^{-1}$	B1	PPRTV (RSL)	5/2013
Copper	NA	NA	D	IRIS	8/21/2013
Dibenzo(a,h)anthracene (1)	1.2E-03	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Dibenzofuran	NA	NA	NA	NA	NA
Ethylbenzene	2.5E-06	$(ug/m^3)^{-1}$	D	Cal/EPA (RSL)	5/2013
Hexachloroethane	1.1E-05	$(ug/m^3)^{-1}$	(3)	Cal/EPA (RSL)	5/2013
Indeno(1,2,3-cd)pyrene (1)	1.1E-04	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Iron	NA	NA	NA	NA	NA
Lead	NA	NA	B2	IRIS	8/21/2013
Manganese	NA	NA	D	IRIS	8/21/2013
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	C	Cal/EPA (RSL)	5/2013
Pentachlorophenol	5.1E-06	$(ug/m^3)^{-1}$	B2	Cal/EPA (RSL)	5/2013
Pyrene	NA	NA	D	IRIS	8/21/2013
Total PCB (Calc)	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (RSL)	5/1/2013
Trichloroethylene (2)	4.1E-06	$(ug/m^3)^{-1}$	(4)	IRIS	8/21/2013
Trichloroethylene (Kidney)	1.0E-06	$(ug/m^3)^{-1}$	(2)	IRIS	8/21/2013
Trichloroethylene (NHL+Liver)	3.1E-06	$(ug/m^3)^{-1}$	(2)	IRIS	8/21/2013
Vanadium	NA	NA	NA	NA	NA
Xylenes, m&p	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA

Note:

Total PCB (Calc) will be used to evaluate risk from PCBs in the HHRA. The toxicity value for Aroclor-1248 will be used to represent cancer risk.

Definitions:

NA = Not Available

IRIS = Integrated Risk Information System

CalEPA = California EPA

PPRTV = Provisional Peer-Reviewed Toxicity Value

(1) This chemical operates with a mutagenic mode of action.
With the exception of vinyl chloride, chemical-specific data are not available; therefore, USEPA (2005) default age-dependent adjustment factors (ADAF) will be applied to the slope factor as follows:

TABLE 5.2
CANCER TOXICITY DATA -- INHALATION
Record of Decision
Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
	AGE	AGE ADAF		RSL = As cited in EPA Regional Screening Level Table	
	0-<2	10			
	2-<16	3			
	16-<30	1			

(2) EPA has concluded, by a weight of evidence evaluation, that TCE is carcinogenic by a mutagenic mode of action for induction of kidney tumors. As a result, increased early-life susceptibility is assumed for kidney cancer and the age-dependent adjustment factors (ADAFs) were used for the kidney cancer component of the total cancer risk when estimating age-specific cancer risks. Cancer risk estimates will also account for non-Hodgkins Lymphoma (NHL) and liver contribution.

(3) Likely to be carcinogenic to humans

(4) Carcinogenic to humans

(5) In the RSL Table, the Cr(VI) specific value (assuming 100% Cr(VI)) is derived by multiplying the IRIS Cr(VI) value by 7. This is considered to be a health-protective assumption, and is also consistent with the State of California's interpretation of the Mancuso study that forms the basis of Cr(VI)'s estimated cancer potency.

(6) Suggestive evidence of carcinogenic potential

Weight of Evidence definitions:
Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.
Group E chemicals (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

TABLE 6.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Remedial Investigation/Feasibility Study

Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1'-Biphenyl	Chronic	5.0E-01	mg/kg-day	> 50%	5.0E-01	mg/kg-day	Kidney	30	IRIS	8/27/2013
1,2,4-Trimethylbenzene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	Chronic	9.0E-02	mg/kg-day	> 50%	9.0E-02	mg/kg-day	Liver	1000	ATSDR (RSL)	5/2013
Aluminum	Chronic	1.0E+00	mg/kg-day	> 50%	1.0E+00	mg/kg-day	Neurotoxicity	100 / 1	PPRTV (RSL)	5/2013
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000 / 1	IRIS	
Aroclor-1242	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	Chronic	2.0E-05	mg/kg-day	80 - 96%	2.0E-05	mg/kg-day	Finger nails, Eyes	300 / 1	IRIS	8/21/2013
Aroclor-1260	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin, Vascular Complications	3 / 1	IRIS	8/21/2013
Benzene	Chronic	4.0E-03	mg/kg-day	> 50%	4.0E-03	mg/kg-day	Blood	300 / 1	IRIS	8/21/2013
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg-day	> 50%	2.0E-02	mg/kg-day	Liver	1000 / 1	IRIS	8/21/2013
Bromodichloromethane	Chronic	2.0E-02	mg/kg-day	> 50%	2.0E-02	mg/kg-day	Kidney	1000 / 1	IRIS	8/21/2013
Cadmium (water)	Chronic	5.0E-04	mg/kg-day	5%	2.5E-05	mg/kg-day	Significant proteinuria	10 / 1	IRIS	8/21/2013
Chloroform	Chronic	1.0E-02	mg/kg-day	> 50%	1.0E-02	mg/kg-day	Liver	100 / 1	IRIS	8/21/2013
Chromium (III)	Chronic	1.5E+00	mg/kg-day	1.3%	2.0E-02	mg/kg-day	NOE	100 / 10	IRIS	8/21/2013
Chromium (VI)	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	NOE	300 / 3	IRIS	8/21/2013
Chrysene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	3.0E-04	mg/kg-day	> 50%	3.0E-04	mg/kg-day	Iodine uptake	3000 / 1	PPRTV (RSL)	5/2013
Copper	Chronic	4.0E-02	mg/kg-day	> 50%	4.0E-02	mg/kg-day	Gastrointestinal	NA	HEAST	07/31/1997
Dibenzo(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Chronic	1.0E-03	mg/kg-day	> 50%	1.0E-03	mg/kg-day	Whole body	300	PPRTV (RSL)	5/2013
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	> 50%	1.0E-01	mg/kg-day	Liver, Kidney	1000 / 1	IRIS	8/21/2013
Hexachloroethane	Chronic	7.0E-04	mg/kg-day	> 50%	7.0E-04	mg/kg-day	Kidney	1000 / 1	IRIS	8/21/2013
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Chronic	7.0E-01	mg/kg-day	> 50%	7.0E-01	mg/kg-day	Gastrointestinal	1.5	PPRTV (RSL)	5/2013
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (non-diet)	Chronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	CNS	1 / 1	IRIS (3)	8/21/2013
Naphthalene	Chronic	2.0E-02	mg/kg-day	58-89%	2.0E-02	mg/kg-day	Body weight	3000 / 1	IRIS	8/21/2013
Pentachlorophenol	Chronic	5.0E-03	mg/kg-day	> 50%	5.0E-03	mg/kg-day	Liver	300 / 1	IRIS	8/21/2013
Pyrene	Chronic	3.0E-02	mg/kg-day	58-89%	3.0E-02	mg/kg-day	Kidney	3000 / 1	IRIS	8/21/2013

TABLE 6.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

Remedial Investigation/Feasibility Study

Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Total PCB (Calc)	Chronic	2.0E-05	mg/kg-day	80 - 96%	2.0E-05	mg/kg-day	Finger nails, Eyes	300 / 1	IRIS	8/21/2013
Trichloroethylene	Chronic	5.0E-04	mg/kg-day	> 50%	5.0E-04	mg/kg-day	multiple (see below)	multiple (see below)	IRIS	8/21/2013
	Chronic	4.8E-04	mg/kg-day	> 50%	4.8E-04	mg/kg-day	Adult immunological effects	100 / 1	IRIS	8/21/2013
	Chronic	3.7E-04	mg/kg-day	> 50%	3.7E-04	mg/kg-day	Development Immunotoxicity	1000 / 1	IRIS	8/21/2013
	Chronic	5.1E-04	mg/kg-day	> 50%	5.1E-04	mg/kg-day	Heart malformations	10 / 1	IRIS	8/21/2013
Vanadium	Chronic	5.0E-03	mg/kg-day	2.6%	1.3E-04	mg/kg-day	Hair Cystine	100 / 1	IRIS (RSL)	5/2013
Xylenes, m&p	Chronic	2.0E-01	mg/kg-day	> 50%	2.0E-01	mg/kg-day	Body Weight, Mortality	1000 / 1	IRIS	8/21/2013
Zinc	Chronic	3.0E-01	mg/kg-day	Variable	3.0E-01	mg/kg-day	Blood	3	IRIS	8/21/2013

Note:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of >50%.

(2) Adjusted based on RAGS Part E.

(3) The RfD (0.14 mg/kg-day) presented in IRIS includes manganese from all sources, including diet. This RfD was adjusted by subtracting the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) and applying a modifying factor of 3 to address uncertainties associated with non-food manganese exposure sources.

Definitions:

NA = Not Available

CNS = Central Nervous System

HEAST = Health Effects Assessment Summary Tables

IRIS = Integrated Risk Information System

NOE = No Observed Effects

PPRTV = Provisional Peer-Reviewed Toxicity Value

RSL = As cited in EPA Regional Screening Level Table

Vanadium and compounds was used to represent Vanadium.

Total PCB (Calc) will be used to evaluate risk from PCBs in the HHRA. The toxicity value for Aroclor-1254 will be used to represent non-cancer risk.

TABLE 6.2

NON-CANCER TOXICITY DATA -- INHALATION

Remedial Investigation/Feasibility Study

Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation Ruff		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
1,1'-Biphenyl	Chronic	4.0E-04	mg/m^3	Liver; Kidney	3000	PPRTV (RSL)	5/2013
1,2,4-Trimethylbenzene	Chronic	7.0E-03	mg/m^3	Clotting Time (Blood)	3000	PPRTV (RSL)	5/2013
1,2-Dichloropropane	Chronic	4.0E-03	mg/m^3	Respiratory	300 / 1	IRIS	8/21/2013
Aluminum	Chronic	5.0E-03	mg/m^3	Psychomotor & cognitive impairment	300	PPRTV (RSL)	5/2013
Antimony	Chronic	NA	NA	NA	NA	NA	NA
Aroclor-1242	Chronic	NA	NA	NA	NA	NA	NA
Aroclor-1248	Chronic	NA	NA	NA	NA	NA	NA
Aroclor-1254	Chronic	NA	NA	NA	NA	NA	NA
Aroclor-1260	Chronic	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	1.5E-05	mg/m^3	Developmental, Cardiovascular System, Nervous System	NA	Cal/EPA (RSL)	5/2013
Benzene	Chronic	3.0E-02	mg/m^3	Blood	300 / 1	IRIS	8/21/2013
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	Chronic	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	NA	NA	NA	NA	NA	NA
Bromodichloromethane	Chronic	NA	NA	NA	NA	NA	NA
Cadmium	Chronic	1.0E-05	mg/m^3	Kidney	9	ATSDR (RSL)	5/2013
Chloroform	Chronic	9.8E-02	mg/m^3	Liver	100	ATSDR (1)	5/2013
Chromium (III)	Chronic	NA	NA	NA	NA	NA	NA
Chromium (VI)	Chronic	1.0E-04	mg/m^3	Respiratory	300 / 1	IRIS	8/21/2013
Chrysene	Chronic	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	6.0E-06	mg/m^3	Respiratory	300 / 1	PPRTV (RSL)	5/2013
Copper	Chronic	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA
Dibenzofuran	Chronic	NA	NA	NA	NA	NA	NA
Ethylbenzene	Chronic	1.0E+00	mg/m^3	Development	300 / 1	IRIS	8/21/2013
Hexachloroethane	Chronic	3.0E-02	mg/m^3	Neurotoxicity	3000 / 1	IRIS	8/21/2013
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA
Iron	Chronic	NA	NA	NA	NA	NA	NA
Lead	Chronic	NA	NA	NA	NA	NA	NA

TABLE 6.2

NON-CANCER TOXICITY DATA -- INHALATION

Remedial Investigation/Feasibility Study

Amcast Industrial Site, Cedarburg, Wisconsin

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation Ruff		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Manganese	Chronic	5.0E-05	mg/m^3	Neurological	1000 / 1	IRIS	8/21/2013
Naphthalene	Chronic	3.0E-03	mg/m^3	respiratory	3000 / 1	IRIS	8/21/2013
Pentachlorophenol	Chronic	NA	NA	NA	NA	NA	NA
Pyrene	Chronic	NA	NA	NA	NA	NA	NA
Total PCB (Calc)	Chronic	NA	NA	NA	NA	NA	NA
Trichloroethylene	Chronic	2.0E-03	mg/m^3	multiple (see below)	multiple (see below)	IRIS	8/21/2013
	Chronic	1.9E-03	mg/m^3	immunotoxicity	100 / 1	IRIS	8/21/2013
	Chronic	2.1E-03	mg/m^3	heart malformations	10 / 1	IRIS	8/21/2013
Vanadium	Chronic	1.0E-04	NA	Respiratory	30	ATSDR (RSL)	5/2013
Xylenes, m&p	Chronic	1.0E-01	mg/m^3	Nervous System	300 / 1	IRIS	8/21/2013
Zinc	Chronic	NA	NA	NA	NA	NA	NA

Note:

Definitions: NA = Not Available

ATSDR = Agency for Toxic Substances and Disease Registry MRL List

Cal/EPA = California Environmental Protection Agency

IRIS = Integrated Risk Information System

PPRTV = Provisional Peer-Reviewed Toxicity Value

RSL = As cited in EPA Regional Screening Level Table

Table 7.1

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Amcast North Surface Soil (0-2 ft)	Total PCB (Calc)					Finger Nails, Eyes	2E+00	NA	3E+00	5E+00
		Exposure Point Total		NA	NA	NA	NA		2E+00	NA	3E+00	5E+00
	Exposure Medium Total			NA	NA	NA	NA		2E+00	NA	3E+00	5E+00
Medium Total				NA	NA	NA	NA		2E+00	NA	3E+00	5E+00
Receptor Total				NA	NA	NA	NA		2E+00	NA	3E+00	5E+00

NA = Not applicable or not available

Total Eyes HI Across Media =	**5E+00**
Total Finger nails HI Across Media =	**5E+00**

Table 7.2

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Wilshire Pond Bank Surface Soil (0 - 2 ft)	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	2E+00	NA	1E+00	3E+00
		Exposure Point Total		0E+00	NA	0E+00	0E+00		2E+00	NA	1E+00	3E+00
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		2E+00	NA	1E+00	3E+00
Medium Total				0E+00	0E+00	0E+00	0E+00		2E+00	NA	1E+00	3E+00
Sediment	Sediment	Quarry Pond Sediment	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	1E+00	NA	2E+01	2E+01
		Exposure Point Total		0E+00	NA	0E+00	0E+00		1E+00	NA	2E+01	2E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		1E+00	NA	2E+01	2E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		1E+00	NA	2E+01	2E+01
Receptor Total				0E+00	0E+00	0E+00	0E+00		3E+00	NA	2E+01	2E+01

NA = Not applicable or not available

Total Eyes HI Across Media = **2E+01**

Total Finger nails HI Across Media = **2E+01**

Table 7.3

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Wilshire Pond Bank Surface Soil (0 - 2 ft)	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	2E+01	NA	8E+00	3E+01
		Exposure Point Total		0E+00	NA	0E+00	0E+00		2E+01	NA	8E+00	3E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		2E+01	NA	8E+00	3E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		2E+01	NA	8E+00	3E+01
Sediment	Sediment	Quarry Pond Sediment	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	1E+01	NA	4E+01	5E+01
		Exposure Point Total		0E+00	NA	0E+00	0E+00		1E+01	NA	4E+01	5E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		1E+01	NA	4E+01	5E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		1E+01	NA	4E+01	5E+01
Receptor Total				0E+00	0E+00	0E+00	0E+00		3E+01	NA	5E+01	8E+01

NA = Not applicable or not available

Total Eyes HI Across Media = **8E+01**

Total Finger nails HI Across Media = **8E+01**

Table 7.4

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Quarry Pond Sediment	Total PCB (Calc)	5E-05	NA	4E-04	4E-04	Finger Nails, Eyes	NA	NA	NA	NA
		Exposure Point Total		5E-05	NA	4E-04	4E-04		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			5E-05	NA	4E-04	4E-04		0E+00	NA	0E+00	0E+00
Medium Total				5E-05	0E+00	4E-04	4E-04		0E+00	0E+00	0E+00	0E+00
Receptor Total				5E-05	0E+00	4E-04	4E-04		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 7.5

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Receptor Population: Recreational Angler
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish	Quarry Pond Fish Fillets	Total PCB (Calc)	3E-03	NA	0E+00	3E-03	Finger Nails, Eyes	2E+02	NA	0E+00	2E+02
		Exposure Point Total		3E-03	NA	0E+00	3E-03		2E+02	NA	0E+00	2E+02
	Exposure Medium Total			3E-03	NA	0E+00	3E-03		2E+02	NA	0E+00	2E+02
Medium Total				3E-03	0E+00	0E+00	3E-03		2E+02	0E+00	0E+00	2E+02
Receptor Total				3E-03	0E+00	0E+00	3E-03		2E+02	0E+00	0E+00	2E+02

NA = Not applicable or not available

Total Eyes HI Across Media = **2E+02**

Total Finger nails HI Across Media = **2E+02**

Table 7.6

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Current/Future
Receptor Population: Recreational Angler
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Fish	Fish	Quarry Pond Fish Fillets	Total PCB (Calc)	1E-03	NA	0E+00	1E-03	Finger Nails, Eyes	3E+02	NA	0E+00	3E+02
		Exposure Point Total		1E-03	NA	0E+00	1E-03		3E+02	NA	0E+00	3E+02
	Exposure Medium Total			1E-03	NA	0E+00	1E-03		3E+02	NA	0E+00	3E+02
Medium Total				1E-03	0E+00	0E+00	1E-03		3E+02	0E+00	0E+00	3E+02
Receptor Total				1E-03	0E+00	0E+00	1E-03		3E+02	0E+00	0E+00	3E+02

NA = Not applicable or not available

Total Eyes HI Across Media =	**3E+02**
Total Finger nails HI Across Media =	**3E+02**

Table 7.7

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast North Total Soil (0 - 10 ft)	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	9E+00	NA	5E+00	1E+01
		Exposure Point Total		0E+00	NA	0E+00	0E+00		9E+00	NA	5E+00	1E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		9E+00	NA	5E+00	1E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		9E+00	1E-02	5E+00	1E+01
Groundwater	Groundwater	Tap Water	Arsenic	NA	NA	NA	NA	Skin, Cardiovascular System	2E+00	NA	1E-02	2E+00
			Chromium	NA	NA	NA	NA	NOE	8E-01	NA	2E-01	1E+00
			Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	1E+00	NA	2E+01	2E+01
			Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	Liver	2E-01	NA	1E+01	1E+01
			Hexachloroethane	NA	NA	NA	NA	Kidney	7E-01	NA	8E-01	1E+00
		Exposure Point Total		0E+00	NA	0E+00	0E+00		7E+00	NA	4E+01	5E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		7E+00	NA	4E+01	5E+01
Groundwater	Bathroom Air	Water Vapors in Bathroom Air	1,1'-Biphenyl	NA	NA	NA	NA	Liver, Kidney	NA	3E+00	NA	3E+00
			Naphthalene	NA	NA	NA	NA	Respiratory	NA	1E+00	NA	1E+00
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Blood	NA	2E+00	NA	2E+00
		Exposure Point Total		NA	0E+00	NA	0E+00		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	0E+00	NA	0E+00		NA	5E+00	NA	5E+00
Medium Total				0E+00	0E+00	0E+00	0E+00		7E+00	5E+00	4E+01	5E+01
Receptor Total				0E+00	0E+00	0E+00	0E+00		2E+01	5E+00	4E+01	7E+01

NA = Not applicable or not available

Total Blood HI Across Media =	**2E+00**
Total Cardiovascular System HI Across Media =	**2E+00**
Total Eyes HI Across Media =	**4E+01**
Total Finger nails HI Across Media =	**4E+01**
Total Kidney HI Across Media =	**4E+00**
Total Liver HI Across Media =	**2E+01**
Total Respiratory HI Across Media =	**1.1E+00**
Total Skin HI Across Media =	**2E+00**

Table 7.8

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast North Total Soil (0 - 10 ft)	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	9E+01	NA	3E+01	1E+02
		Exposure Point Total		0E+00	NA	0E+00	0E+00		9E+01	NA	3E+01	1E+02
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		9E+01	NA	3E+01	1E+02
Medium Total				0E+00	0E+00	0E+00	0E+00		9E+01	1E-02	3E+01	1E+02
Groundwater	Groundwater	Tap Water	Arsenic	NA	NA	NA	NA	Skin, Cardiovascular System	5E+00	NA	3E-02	5E+00
			Chromium	NA	NA	NA	NA	NOE	2E+00	NA	5E-01	2E+00
			Manganese	NA	NA	NA	NA	Nervous System	2E+00	NA	3E-01	2E+00
			Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	2E+00	NA	5E+01	5E+01
			Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	Liver	4E-01	NA	3E+01	3E+01
			Hexachloroethane	NA	NA	NA	NA	Kidney	2E+00	NA	2E+00	3E+00
		Exposure Point Total		0E+00	NA	0E+00	0E+00		2E+01	NA	9E+01	1E+02
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		2E+01	NA	9E+01	1E+02
Groundwater	Bathroom Air	Bathroom Air Water Vapors in	Naphthalene	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Blood	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	0E+00	NA	0E+00		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	0E+00	NA	0E+00		NA	2E+01	NA	2E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		2E+01	2E+01	9E+01	1E+02
Receptor Total				0E+00	0E+00	0E+00	0E+00		1E+02	2E+01	1E+02	2E+02

NA = Not applicable or not available

Total Blood HI Across Media =	**5E+00**
Total Cardiovascular System HI Across Media =	**5E+00**
Total Eyes HI Across Media =	**2E+02**
Total Finger nails HI Across Media =	**2E+02**
Total Kidney HI Across Media =	**1E+01**
Total Liver HI Across Media =	**4E+01**
Total Nervous System HI Across Media =	**2E+00**
Total NOE HI Across Media =	**2E+00**
Total Respiratory HI Across Media =	**3E+00**
Total Skin HI Across Media =	**5E+00**

Table 7.9

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast North Total Soil (0 - 10 ft)	Arsenic	7E-06	NA	6E-07	7E-06	Skin, Cardiovascular System	NA	NA	NA	NA
			Total PCB (Calc)	4E-04	NA	2E-04	6E-04	Finger Nails, Eyes	NA	NA	NA	NA
			Benzo(a)anthracene	1E-05	NA	5E-06	2E-05	NA	NA	NA	NA	NA
			Benzo(a)pyrene	9E-05	NA	4E-05	1E-04	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	9E-06	NA	3E-06	1E-05	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	9E-06	NA	3E-06	1E-05	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	7E-06	NA	3E-06	1E-05	NA	NA	NA	NA	NA
			Indeno(1,2,3-cd)pyrene	3E-06	NA	1E-06	4E-06	NA	NA	NA	NA	NA
		Exposure Point Total		6E-04	NA	2E-04	8E-04		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			6E-04	NA	2E-04	8E-04		0E+00	NA	0E+00	0E+00
Medium Total				6E-04	3E-09	2E-04	8E-04		0E+00	0E+00	0E+00	0E+00
Groundwater	Groundwater	Tap Water	Arsenic	5E-04	NA	3E-06	6E-04	Skin, Cardiovascular System	NA	NA	NA	NA
			Chromium	3E-03	NA	6E-04	4E-03	NOE	NA	NA	NA	NA
			Total PCB (Calc)	2E-05	NA	5E-04	5E-04	Finger Nails, Eyes	NA	NA	NA	NA
			1,1'-Biphenyl	6E-07	NA	1E-06	2E-06	Kidney	NA	NA	NA	NA
			Benzo(a)anthracene	2E-04	NA	2E-03	2E-03	NA	NA	NA	NA	NA
			Benzo(a)pyrene	1E-02	NA	2E-01	2E-01	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	1E-03	NA	1E-02	2E-02	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	1E-03	NA	2E-02	2E-02	NA	NA	NA	NA	NA
			Bis(2-ethylhexyl)phthalate	3E-05	NA	2E-03	2E-03	Liver	NA	NA	NA	NA
			Chrysene	4E-06	NA	5E-03	5E-03	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	5E-06	NA	1E-04	1E-04	NA	NA	NA	NA	NA
			Hexachloroethane	1E-05	NA	1E-05	2E-05	Kidney	NA	NA	NA	NA
			Indeno(1,2,3-cd)pyrene	1E-03	NA	3E-02	3E-02	NA	NA	NA	NA	NA
			Pentachlorophenol	5E-07	NA	2E-06	2E-06	Liver	NA	NA	NA	NA
			Benzene	3E-06	NA	5E-07	4E-06	Blood	NA	NA	NA	NA
			Ethylbenzene	1E-06	NA	8E-07	2E-06	Liver, Kidney	NA	NA	NA	NA
		Exposure Point Total		2E-02	NA	2E-01	3E-01		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			2E-02	NA	2E-01	3E-01		0E+00	NA	0E+00	0E+00
Groundwater	Bathroom Air	Water Vapors in	Naphthalene	NA	7E-05	NA	7E-05	Respiratory	NA	NA	NA	NA
			Benzene	NA	3E-06	NA	3E-06	Blood	NA	NA	NA	NA
			Bromodichloromethane	NA	6E-06	NA	6E-06	NA	NA	NA	NA	NA
			Chloroform	NA	3E-06	NA	3E-06	Liver	NA	NA	NA	NA
			Ethylbenzene	NA	2E-06	NA	2E-06	Developmental, Cardiovascular System, Nervous System	NA	NA	NA	NA
		Exposure Point Total		NA	8E-05	NA	8E-05		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	8E-05	NA	8E-05		NA	0E+00	NA	0E+00
Medium Total				2E-02	8E-05	2E-01	3E-01		0E+00	0E+00	0E+00	0E+00
Receptor Total				2E-02	8E-05	2E-01	3E-01		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 7.10

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Arsenic	NA	NA	NA	NA	Skin, Cardiovascular System	2E+00	NA	1E-02	2E+00
			Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	1E+00	NA	2E+01	2E+01
			Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	Liver	2E-01	NA	1E+01	1E+01
			Hexachloroethane	NA	NA	NA	NA	Kidney	7E-01	NA	8E-01	1.4E+00
		Exposure Point Total		0E+00	NA	0E+00	0E+00		7E+00	NA	4E+01	5E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		7E+00	NA	4E+01	5E+01
Groundwater	Bathroom Air	Water Vapors in Bathroom Air	1,1'-Biphenyl	NA	NA	NA	NA	Liver, Kidney	NA	3E+00	NA	3E+00
			Naphthalene	NA	NA	NA	NA	Respiratory	NA	1E+00	NA	1.1E+00
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Blood	NA	2E+00	NA	2E+00
		Exposure Point Total		NA	0E+00	NA	0E+00		NA	5E+00	NA	5E+00
	Exposure Medium Total			NA	0E+00	NA	0E+00		NA	5E+00	NA	5E+00
Medium Total				0E+00	0E+00	0E+00	0E+00		7E+00	5E+00	4E+01	5E+01
Receptor Total				0E+00	0E+00	0E+00	0E+00		7E+00	5E+00	4E+01	5E+01

NA = Not applicable or not available

Total Blood HI Across Media =	**2E+00**
Total Cardiovascular System HI Across Media =	**2E+00**
Total Eyes HI Across Media =	**3E+01**
Total Finger nails HI Across Media =	**3E+01**
Total Kidney HI Across Media =	**4E+00**
Total Liver HI Across Media =	**2E+01**
Total Respiratory HI Across Media =	**1.1E+00**
Total Skin HI Across Media =	**2E+00**

Table 7.11

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast South Total Soil (0 - 10 ft)	Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	6E+00	NA	2E+00	8E+00
		Exposure Point Total		0E+00	NA	0E+00	0E+00		7E+00	NA	2E+00	1E+01
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		7E+00	NA	2E+00	1E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		7E+00	2E-02	2E+00	1E+01
Groundwater	Groundwater	Tap Water	Arsenic	NA	NA	NA	NA	Skin, Cardiovascular System	5E+00	NA	3E-02	5E+00
			Chromium	NA	NA	NA	NA	NOE	2E+00	NA	5E-01	2E+00
			Iron	NA	NA	NA	NA	Gastrointestinal	4E-01	NA	3E-03	4E-01
			Total PCB (Calc)	NA	NA	NA	NA	Finger Nails, Eyes	2E+00	NA	5E+01	5E+01
			Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	Liver	4E-01	NA	3E+01	3E+01
			Hexachloroethane	NA	NA	NA	NA	Kidney	2E+00	NA	2E+00	3E+00
		Exposure Point Total		0E+00	NA	0E+00	0E+00		2E+01	NA	9E+01	1E+02
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		2E+01	NA	9E+01	1E+02
Groundwater	Bathroom Air	Water Vapors in Bathroom Air	Naphthalene	NA	NA	NA	NA	Respiratory	NA	3E+00	NA	3E+00
			1,2,4-Trimethylbenzene	NA	NA	NA	NA	Blood	NA	5E+00	NA	5E+00
		Exposure Point Total		NA	0E+00	NA	0E+00		NA	2E+01	NA	2E+01
	Exposure Medium Total			NA	0E+00	NA	0E+00		NA	2E+01	NA	2E+01
Medium Total				0E+00	0E+00	0E+00	0E+00		2E+01	2E+01	9E+01	1E+02
Receptor Total				0E+00	0E+00	0E+00	0E+00		2E+01	2E+01	9E+01	1E+02

NA = Not applicable or not available

Total Blood HI Across Media =	**5E+00**
Total Cardiovascular System HI Across Media =	**5E+00**
Total Eyes HI Across Media =	**6E+01**
Total Finger nails HI Across Media =	**6E+01**
Total Gastrointestinal HI Across Media =	**1.1E+00**
Total Kidney HI Across Media =	**1E+01**
Total Liver HI Across Media =	**4E+01**
Total Nervous System HI Across Media =	**3E+00**
Total NOE HI Across Media =	**2E+00**
Total Respiratory HI Across Media =	**3E+00**
Total Skin HI Across Media =	**5E+00**

Table 7.12

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast South Total Soil (0 - 10 ft)	Arsenic	9E-06	NA	9E-07	1E-05	Skin, Cardiovascular System	NA	NA	NA	NA
			Total PCB (Calc)	3E-05	NA	1E-05	4E-05	Finger Nails, Eyes	NA	NA	NA	NA
			Benzo(a)anthracene	1E-04	NA	6E-05	2E-04	NA	NA	NA	NA	NA
			Benzo(a)pyrene	2E-03	NA	6E-04	2E-03	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	2E-04	NA	7E-05	2E-04	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	1E-04	NA	5E-05	2E-04	NA	NA	NA	NA	NA
			Chrysene	1E-06	NA	4E-05	4E-05	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	4E-04	NA	1E-04	5E-04	NA	NA	NA	NA	NA
			Indeno(1,2,3-cd)pyrene	2E-04	NA	7E-05	3E-04	NA	NA	NA	NA	NA
		Exposure Point Total		3E-03	NA	1E-03	4E-03		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			3E-03	NA	1E-03	4E-03		0E+00	NA	0E+00	0E+00
Medium Total				3E-03	6E-08	1E-03	4E-03		0E+00	0E+00	0E+00	0E+00
Groundwater	Groundwater	Tap Water	Arsenic	5E-04	NA	3E-06	6E-04	Skin, Cardiovascular System	NA	NA	NA	NA
			Chromium	3E-03	NA	6E-04	4E-03	NOE	NA	NA	NA	NA
			Total PCB (Calc)	2E-05	NA	5E-04	5E-04	Finger Nails, Eyes	NA	NA	NA	NA
			1,1'-Biphenyl	6E-07	NA	1E-06	2E-06	Kidney	NA	NA	NA	NA
			Benzo(a)anthracene	2E-04	NA	2E-03	2E-03	NA	NA	NA	NA	NA
			Benzo(a)pyrene	1E-02	NA	2E-01	2E-01	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	1E-03	NA	1E-02	2E-02	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	1E-03	NA	2E-02	2E-02	NA	NA	NA	NA	NA
			Bis(2-ethylhexyl)phthalate	3E-05	NA	2E-03	2E-03	Liver	NA	NA	NA	NA
			Chrysene	4E-06	NA	5E-03	5E-03	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	5E-06	NA	1E-04	1E-04	NA	NA	NA	NA	NA
			Hexachloroethane	1E-05	NA	1E-05	2E-05	Kidney	NA	NA	NA	NA
			Indeno(1,2,3-cd)pyrene	1E-03	NA	3E-02	3E-02	NA	NA	NA	NA	NA
			Pentachlorophenol	5E-07	NA	2E-06	2E-06	Liver	NA	NA	NA	NA
			Benzene	3E-06	NA	5E-07	4E-06	Blood	NA	NA	NA	NA
			Ethylbenzene	1E-06	NA	8E-07	2E-06	Liver, Kidney	NA	NA	NA	NA
		Exposure Point Total		2E-02	NA	2E-01	3E-01		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			2E-02	NA	2E-01	3E-01		0E+00	NA	0E+00	0E+00
Groundwater	Bathroom Air	Water Vapors in Bathroom Air	Naphthalene	NA	7E-05	NA	7E-05	Respiratory	NA	NA	NA	NA
			Benzene	NA	3E-06	NA	3E-06	Blood	NA	NA	NA	NA
			Bromodichloromethane	NA	6E-06	NA	6E-06	NA	NA	NA	NA	NA
			Chloroform	NA	3E-06	NA	3E-06	Liver	NA	NA	NA	NA
			Ethylbenzene	NA	2E-06	NA	2E-06	Developmental, Cardiovascular System, Nervous System	NA	NA	NA	NA
		Exposure Point Total		NA	8E-05	NA	8E-05		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	8E-05	NA	8E-05		NA	0E+00	NA	0E+00
Medium Total				2E-02	8E-05	2E-01	3E-01		0E+00	0E+00	0E+00	0E+00
Receptor Total				2E-02	8E-05	2E-01	3E-01		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 7.13

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast North	Arsenic	2E-06	NA	3E-07	2E-06	Skin, Cardiovascular System	9E-03	NA	2E-03	1E-02
		Total Soil (0 - 10 ft)	Total PCB (Calc)	9E-05	NA	9E-05	2E-04	Finger Nails, Eyes	7E+00	NA	6E+00	1E+01
			Benzo(a)pyrene	5E-06	NA	4E-06	9E-06	NA	NA	NA	NA	NA
		Exposure Point Total		1E-04	NA	9E-05	2E-04		7E+00	NA	6E+00	1E+01
	Exposure Medium Total			1E-04	NA	9E-05	2E-04		7E+00	NA	6E+00	1E+01
Medium Total				1E-04	7E-09	9E-05	2E-04		7E+00	4E-05	6E+00	1E+01
Groundwater	Groundwater	Tap Water	Arsenic	1E-04	NA	4E-07	1E-04	Skin, Cardiovascular System	8E-01	NA	3E-03	8E-01
			Chromium	2E-04	NA	2E-05	2E-04	NOE	3E-01	NA	4E-02	3E-01
			Total PCB (Calc)	5E-06	NA	6E-05	6E-05	Finger Nails, Eyes	4E-01	NA	4E+00	4E+00
			Benzo(a)anthracene	8E-06	NA	5E-05	6E-05	NA	NA	NA	NA	NA
			Benzo(a)pyrene	5E-04	NA	5E-03	6E-03	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	7E-05	NA	4E-04	5E-04	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	6E-05	NA	6E-04	7E-04	NA	NA	NA	NA	NA
			Bis(2-ethylhexyl)phthalate	6E-06	NA	3E-04	3E-04	Liver	6E-02	NA	3E+00	3E+00
			Chrysene	2E-07	NA	1E-04	1E-04	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	3E-07	NA	4E-06	5E-06	NA	NA	NA	NA	NA
			Hexachloroethane	2E-06	NA	1E-06	4E-06	Kidney	2E-01	NA	1E-01	4E-01
			Indeno(1,2,3-cd)pyrene	5E-05	NA	1E-03	1E-03	NA	NA	NA	NA	NA
		Exposure Point Total		1E-03	NA	8E-03	9E-03		2E+00	NA	7E+00	9E+00
	Exposure Medium Total			1E-03	NA	8E-03	9E-03		2E+00	NA	7E+00	9E+00
Receptor Total				1E-03	7E-09	8E-03	9E-03		9E+00	4E-05	1E+01	2E+01

NA = Not applicable or not available

Total Eyes HI Across Media =	**2E+01**
Total Finger nails HI Across Media =	**2E+01**
Total Liver HI Across Media =	**3E+00**

Table 7.14

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast South Total Soil (0 - 10 ft)	Arsenic	2E-06	NA	4E-07	2E-06	Skin, Cardiovascular System	1E-02	NA	3E-03	2E-02
			Total PCB (Calc)	6E-06	NA	6E-06	1E-05	Finger Nails, Eyes	4E-01	NA	4E-01	8E-01
			Benzo(a)anthracene	8E-06	NA	7E-06	1E-05	NA	NA	NA	NA	NA
			Benzo(a)pyrene	9E-05	NA	7E-05	2E-04	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	9E-06	NA	8E-06	2E-05	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	7E-06	NA	6E-06	1E-05	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	2E-05	NA	2E-05	4E-05	NA	NA	NA	NA	NA
			Indeno(1,2,3-cd)pyrene	1E-05	NA	8E-06	2E-05	NA	NA	NA	NA	NA
		Exposure Point Total		1E-04	NA	1E-04	3E-04		4E-01	NA	4E-01	8E-01
	Exposure Medium Total			1E-04	NA	1E-04	3E-04		4E-01	NA	4E-01	8E-01
Medium Total				1E-04	6E-09	1E-04	3E-04		4E-01	6E-05	4E-01	8E-01
Groundwater	Groundwater	Tap Water	Arsenic	1E-04	NA	4E-07	1E-04	Skin, Cardiovascular System	8E-01	NA	3E-03	8E-01
			Total PCB (Calc)	5E-06	NA	6E-05	6E-05	Finger Nails, Eyes	4E-01	NA	4E+00	4E+00
			Benzo(a)anthracene	8E-06	NA	5E-05	6E-05	NA	NA	NA	NA	NA
			Benzo(a)pyrene	5E-04	NA	5E-03	6E-03	NA	NA	NA	NA	NA
			Benzo(b)fluoranthene	7E-05	NA	4E-04	5E-04	NA	NA	NA	NA	NA
			Benzo(k)fluoranthene	6E-05	NA	6E-04	7E-04	NA	NA	NA	NA	NA
			Bis(2-ethylhexyl)phthalate	6E-06	NA	3E-04	3E-04	Liver	6E-02	NA	3E+00	3E+00
			Chrysene	2E-07	NA	1E-04	1E-04	NA	NA	NA	NA	NA
			Dibenzo(a,h)anthracene	3E-07	NA	4E-06	5E-06	NA	NA	NA	NA	NA
			Hexachloroethane	2E-06	NA	1E-06	4E-06	Kidney	2E-01	NA	1E-01	4E-01
			Indeno(1,2,3-cd)pyrene	5E-05	NA	1E-03	1E-03	NA	NA	NA	NA	NA
		Exposure Point Total		1E-03	NA	8E-03	9E-03		2E+00	NA	7E+00	9E+00
	Exposure Medium Total			1E-03	NA	8E-03	9E-03		2E+00	NA	7E+00	9E+00
Receptor Total				1E-03	6E-09	8E-03	9E-03		3E+00	6E-05	7E+00	1E+01

NA = Not applicable or not available

Total Eyes HI Across Media =	**5E+00**
Total Finger nails HI Across Media =	**5E+00**
Total Liver HI Across Media =	**3E+00**

Table 7.15

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast North Total Soil (0 - 10 ft)	Total PCB (Calc)	1E-05	NA	5E-06	2E-05	Finger Nails, Eyes	2E+01	NA	9E+00	3E+01
		Exposure Point Total		NA	NA	NA	NA		2E+01	NA	9E+00	3E+01
	Exposure Medium Total			NA	NA	NA	NA		2E+01	NA	9E+00	3E+01
Medium Total				NA	NA	NA	NA		2E+01	4E-03	9E+00	3E+01
Receptor Total				NA	NA	NA	NA		2E+01	4E-03	9E+00	3E+01

NA = Not applicable or not available

Total Eyes HI Across Media =	**3E+01**
Total Finger nails HI Across Media =	**3E+01**

Table 7.16

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

Record of Decision

Amcast Industrial Site, Cedarburg, Wisconsin

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Total Soil	Amcast South Total Soil (0 - 10 ft)	Total PCB (Calc)					Finger Nails, Eyes	1E+00	NA	6E-01	2E+00
		Exposure Point Total		NA	NA	NA	NA		1E+00	NA	6E-01	2E+00
	Exposure Medium Total			NA	NA	NA	NA		1E+00	NA	6E-01	2E+00
Medium Total				NA	NA	NA	NA		1E+00	6E-03	6E-01	2E+00
Receptor Total				NA	NA	NA	NA		1E+00	6E-03	6E-01	2E+00

NA = Not applicable or not available

Total Eyes HI Across Media =	**2E+00**
Total Finger nails HI Across Media =	**2E+00**

Table 8
Contaminants of Concern
Amcast Industrial Superfund Site, Cedarburg, Wisconsin

Exposure Location/Media	Potential Receptor Group	PCBs	Metals					PAHs								Non-PAH SVOCs			VOCs						
		PCBs	Arsenic	Chromium	Manganese	Lead	Copper	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	HMW PAHs	bis(2-ethylhexyl)phthalate	Hexachloroethane	Pentachlorophenol	1,1'-biphenyl	1,2,4-trimethylbenzene	Benzene	Bromodichloromethane	Chloroform	Ethylbenzene	Naphthalene
Amcast North Surface Soil (0-2 feet)	Ecological	X			X																				
Amcast North Total Soil (0-10 feet)	Residents (adults and children)	X						X	X	X	X		X	X											
	Industrial Workers	X																							
	Construction Workers	X																							
Residential Yards (0-2 feet)	Residents (adults and children)	X																							
	Ecological	X																							
Amcast South Surface Soil (0-2 feet)	Ecological	X			X	X	X								X										
Amcast South Total Soil (0-10 feet)	Residents (adults and children)	X				X		X	X	X	X	X	X	X											
	Industrial Workers	X						X	X	X	X		X	X											
	Construction Workers	X																							
Zeunert Park Surface Soil	None	No COCs																							
Quarry Pond Sediment	Residents (adults and children)	X																							
	Ecological	X																							
Quarry Pond Surface Water	None	No COCs																							
Quarry Pond Fish Fillets	Recreational Anglers (adults and children)	X																							
Wilshire Pond Bank Surface Soil	Recreational Users (adults and children)	X																							
Wilshire Pond Surface Water	None	No COCs																							
Wilshire Pond Sediment	Ecological	X																							
Sidewide Groundwater (tapwater use)	Adults and Children	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
	Industrial Workers	X	X	X				X	X	X	X	X	X	X		X	X								

Notes:
HMW PAHs are the sum total of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perlyene, chrysene, dibenzo(a,h)anthracene, and pyrene.

COC	Contaminant of concern
mg/kg	Milligrams per kilogram
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
SVOC	Semi-volatile organic compound
VOC	Volatile organic compound
Surface Soil	0 to 2 feet below ground surface with ingestion, dermal contact, and inhalation assumed
Subsurface Soil	Total soil 0 to 10 feet below ground surface

Table 9
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
Record of Decision, Amcast Industrial Site, Cedarburg, Wisconsin

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Terrestrial Habitats			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect soil invertebrate communities?	Comparison of maximum chemical concentrations in surface soil with soil screening values	Soil invertebrates
Survival, growth, and reproduction of terrestrial plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect terrestrial plant communities?	Comparison of maximum chemical concentrations in surface soil with soil screening values	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile and amphibian populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to terrestrial reptile and amphibian populations?	Comparison of maximum chemical concentrations in surface soil with soil screening values Evidence of potential risk to other upper trophic level terrestrial receptors evaluated in the SERA	Amphibians Reptiles
Survival, growth, and reproduction of avian terrestrial herbivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants (seeds) from the site?	Comparison of modeled dietary intakes using maximum surface soil concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Mourning dove
Survival, growth, and reproduction of avian terrestrial invertivore/omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of modeled dietary intakes using maximum surface soil concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	American robin
Survival, growth, and reproduction of avian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using maximum surface soil concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Red-tailed hawk
Survival, growth, and reproduction of mammalian terrestrial herbivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume plants from the site?	Comparison of modeled dietary intakes using maximum surface soil concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Meadow vole
Survival, growth, and reproduction of mammalian terrestrial invertivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume soil invertebrates from the site?	Comparison of modeled dietary intakes using maximum surface soil concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Short-tailed shrew

Table 9
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
Amcast Industrial Site, Cedarburg, Wisconsin

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of mammalian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using maximum surface soil concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Red fox
Aquatic Habitats			
Survival, growth, and reproduction of benthic invertebrate communities	Are site-related chemical concentrations in surface water and surface sediment sufficient to adversely effect benthic invertebrate communities?	Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values	Benthic invertebrates
Survival, growth, and reproduction of aquatic plant communities	Are site-related chemical concentrations in surface water and surface sediment sufficient to adversely affect aquatic plant communities?	Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values	Aquatic plants
Survival, growth, and reproduction of fish communities	Are site-related chemical concentrations in surface water and surface sediment sufficient to adversely effect fish communities?	Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values; evaluation of whole-body tissue concentrations (PCBs)	Fish
Survival, growth, and reproduction of aquatic amphibian populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to aquatic amphibian populations?	Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values; evaluation of whole-body tissue concentrations (PCBs) Evidence of potential risk to other upper trophic level aquatic receptors evaluated in the SERA	Amphibians
Survival, growth, and reproduction of aquatic reptile populations	Are site-related chemical concentrations in surface water and surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to aquatic reptile populations?	Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values Evidence of potential risk to other upper trophic level aquatic receptors evaluated in the SERA	Reptiles
Survival, growth, and reproduction of piscivorous bird populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume fish from the site?	Comparison of modeled dietary intakes using maximum surface sediment, surface water, and fish/frog tissue concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Great blue heron Belted kingfisher

Table 9
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
Amcast Industrial Site, Cedarburg, Wisconsin

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of omnivorous bird populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume aquatic prey from the site?	Comparison of modeled dietary intakes using maximum surface sediment and surface water concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Mallard
Survival, growth, and reproduction of herbivorous bird populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume aquatic plants from the site?	Comparison of modeled dietary intakes using maximum surface sediment and surface water concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Canada goose
Survival, growth, and reproduction of insectivorous bird populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume aquatic prey from the site?	Comparison of modeled dietary intakes using maximum surface sediment and surface water concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Tree swallow
Survival, growth, and reproduction of herbivorous mammal populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume aquatic plants from the site?	Comparison of modeled dietary intakes using maximum surface sediment and surface water concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Muskrat
Survival, growth, and reproduction of omnivorous mammal populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume aquatic prey from the site?	Comparison of modeled dietary intakes using maximum surface sediment, surface water, and fish/frog tissue concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Raccoon
Survival, growth, and reproduction of piscivorous mammal populations	Are site-related chemical concentrations in surface water and sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume fish from the site?	Comparison of modeled dietary intakes using maximum surface sediment, surface water, and fish/frog tissue concentrations with literature-based ingestion TRVs; ratios ≥1 based on the NOAEL indicate an effect	Mink

Table 10
Final Ecological Chemicals of Concern
Record of Decision, Amcast Industrial Site, Cedarburg, Wisconsin

Exposure Location/Medium	Aroclor 1248	Aroclor 1254	Total PCBs	Copper	Manganese	HMW PAHs
Terrestrial Habitats						
Amcast North - Surface Soil	X		X		X	
Amcast North - Terrestrial Food Web	X		X			
Residential Area - Surface Soil	X	X	X			
Residential Area - Terrestrial Food Web	X	X	X			
Amcast South - Surface Soil	X	X	X	X	X	X
Amcast South - Terrestrial Food Web	X		X			
Zeunert Park - Surface Soil	No COCs					
Zeunert Park - Terrestrial Food Web	X		X			
Aquatic Habitats						
Quarry Pond Surface Water	No COCs					
Quarry Pond Sediment	X		X			
Quarry Pond Bank Sediment	No COCs					
Quarry Pond Fish Tissue	X		X			
Quarry Pond Food Web	X		X			
Wilshire Pond Surface Water	No COCs					
Wilshire Pond Sediment (Basin and Bank)	X		X			
Wilshire Pond Fish Tissue	X		X			
Wilshire Pond Food Web	X		X			

HMW PAHs are the sum total of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene), and pyrene

Table 11
Applicable or Relevant and Appropriate Requirements
Record of Decision
Amcast Industrial Corporation Superfund Site

				ARAR/TBC Determination by Area				
Requirement	**Citation**	**Description**	**Media**	**Amcast North**	**Amcast South**	**Residential Yards**	**Wilshire & Quarry Ponds**	**Comment**
Chemical-Specific ARARs								
Toxic Substances Control Act (TSCA)	40 CFR 761.61 (c)	Allows development of risk-based cleanup levels for removing PCB-contaminated remediation waste. Requires approval from the Regional Administrator of the EPA region in which the site is located.	Soil	A	A	A	A	EPA intended complex remediation situations such as those found at the Amcast site to be addressed as a risk-based cleanup. This provision allows for flexibility in developing remedial alternatives.
Water Quality Standards for Wisconsin Surface Water	WAC NR 102.04(1)(a) and (d); WAC NR 105.06 and 105.07; 40 CFR 132	Substances that will cause objectionable deposits on the shore or in the bed or a body of water, shall not be present in such amounts as to interfere with public rights in water of the state; and Substances in concentrations or combinations that are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts that are acutely harmful to animal, plant, or aquatic life. The wildlife criterion is the concentration of a substance which, if not exceeded, protects Wisconsin's wildlife from adverse effects resulting from ingestion of surface waters of the state and from ingestion of aquatic organisms taken from surface waters of the state. Federal guidance identifies minimum water quality standards, antidegradation policies, and implementation procedures for the Great Lakes System to protect human health, aquatic life, and wildlife.	Surface Water				R/A	WDNR placed the first 5 miles of Cedar Creak upstream of the confluence with the Milwaukee River on Wisconsin's 303(d) Impaired Waters List for Fish Consumption Advisories due to PCBs in contaminated sediments.
PCB Total Maximum Daily Load for Cedar Creek	WDNR 2008	PCBs Total Maximum Daily Load for Cedar Creek and Milwaukee River (Thiensville Segment) Ozaukee County, WI; proposes a long-term goal of sediment PCB concentrations for Cedar Creek.	Surface Water				TBC	WDNR has established a TMDL for Cedar Creek. The Cedar Creek TMDL = 0.17 grams per day of PCBs. To meet the TMDL, a reduction in PCB loading is needed. Table 4 estimates that the PCB load from Wilshire Pond is 0.081 gram per day; therefore, a 100% load reduction from Wilshire Pond is needed to meet the TMDL and ultimately WDNR's goal of reducing fish tissue levels of PCBs in Cedar Creek to the target value of 0.21 milligram per kilogram. This will allow for the removal of the special fish consumption advisory for Cedar Creek and will meet narrative water quality standards that aim to protect the public health and recreational activities.
Sediment Sampling and Analysis and Review Requirements	WAC NR 347.06	Establishes sediment sampling and analysis requirements for dredging projects regulated by the State of Wisconsin.	Sediment				R/A	Relevant and appropriate because it applies to dredging projects regulated under certain WI statutes; whereas this is a CERCLA project. However, the sampling requirements are appropriate to be followed.
Groundwater Quality	WAC NR 140 and 160	Establishes groundwater quality standards for substances detected in or having a reasonable probability of entering the groundwater resources of the state; to specify scientifically valid procedures for determining if a numerical standard has been attained or exceeded; to specify procedures for establishing points of standards application, and for evaluating groundwater monitoring data.	Groundwater	A	A		A	Table 1 contains Public Health Groundwater Quality Standards, and Table 2 contains Public Welfare Groundwater Quality Standards.
Safe Drinking Water	WAC NR 809	Establishes drinking water standards for water supplies, including federal MCLs. Also specifies sampling and analysis requirements.	Groundwater	A	A	A	A	Establishes baseline levels for monitoring constituents in groundwater.
Action-specific ARARs								
Dust	WAC NR 415	Establishes standards for fugitive dust emissions and specifies that precautions should be taken to prevent particulate matter from becoming airborne.	Soil/ Sediment	A	A	A	A	Standards will be followed during construction activities that generate dust.

Table 11
Applicable or Relevant and Appropriate Requirements
Record of Decision
Amcast Industrial Corporation Superfund Site

				ARAR/TBC Determination by Area				
Requirement	**Citation**	**Description**	**Media**	**Amcast North**	**Amcast South**	**Residential Yards**	**Wilshire & Quarry Ponds**	**Comment**
Stormwater	WAC NR 216.46 and NR 216.47	Prevents and controls water pollution and soil erosion by minimizing the amount of sediment and other pollutants carried by runoff or discharged from land-disturbing construction activity to waters of the state for construction activities that disturb more than 1 acre of land through identification and implementation of best management practices plan.	Soil/ Sediment	A	A	A	A	Obtaining a permit and an approved erosion and sediment control plan or stormwater pollution protection plan is an administrative requirement and is not required for onsite activities. However, the requirements and best management practices associated with this regulation are applicable to some of the proposed remedial alternatives.
Toxic Substances Control Act (TSCA)	40 CFR 761.61 (c)	Establishes cleanup options and storage options for PCB remediation waste, including PCB-contaminated soils. Options include risk-based approval by EPA. Risk-based approval option must demonstrate that cleanup or storage plan will not pose an unreasonable risk of injury to health or the environment.	Soil/ Concrete	A	A	A	A	Applicable to remedial actions that involve PCB remediation wastes.
	40 CFR 761.40	Requirements regarding the marking of PCB containers and PCB storage areas.	Soil/ Concrete	A	A	A	A	Applicable to remedial actions that involve PCB remediation wastes.
	40 CFR 761.65(b)(2)(v), 40 CFR 761.65(c)(3), and 40 CFR 761.65(c)(9)	Requirements regarding storage of PCB remediation waste.	Soil/ Concrete	A	A	A	A	Applicable to remedial actions that involve PCB remediation wastes.
Groundwater Quality	WAC NR 141	Establish minimum acceptable standards for the design, installation, construction, abandonment, and documentation of groundwater monitoring wells.	Groundwater	A	A	A	A	A few of the existing groundwater monitoring wells are no longer functional and will be abandoned and new wells will be installed.
Hazardous Waste	WAC NR 661	This part identifies those solid wastes that are subject to regulation as hazardous wastes under parts 262 through 265, and 268 when transported and disposed offsite. Sets TCLP concentrations above which generated wastes must be managed as hazardous waste. Waste is generated when it is removed from the ground and taken outside of the area of contamination.	Soil/ Sediment/ Concrete	A	A	A	A	Applicable if concentration in waste exceeds TCLP concentrations. Includes procedure for notification of hazardous waste activities.
Hazardous Waste Management Standards Applicable to Generators	WAC NR 662.011 and NR 662.030 through .033	A generator needs to characterize all wastes (including media) that are generated and then appropriately manage any hazardous waste. Generator requirements include properly labeling waste containers, storing containers in containment areas, and protecting them from the elements.	Soil/ Sediment/ Concrete	A	A	A	A	Applicable if hazardous waste is generated.
Hazardous Waste Management Standards Applicable to Use and Management of Containers	WAC NR 665.0171 through 0173	Containers must be in good condition; compatible with the type of waste place the container; always be closed during storage except when it is necessary to add or remove waste; and must not be opened, handled, or stored in a manner that could cause it to rupture or leak.	Soil/ Sediment/ Concrete	A	A	A	A	Applicable if hazardous waste is generated.
Hazardous Waste Management Land Disposal Restriction Requirements	WAC NR 668.07 and NR 668.40 and .48	Provides testing, tracking, and recordkeeping requirements for generators, treatment, and disposal facilities. Provides treatment standards for hazardous wastes. Hazardous wastes must be treated to specific concentrations before they can be placed back on the ground.	Soil/ Sediment/ Concrete	A	A	A	A	Applicable if hazardous waste is generated. If a hazardous waste is generated, the hazardous waste characteristic and all UHCs would need to be treated to the applicable land disposal restriction (LDR) concentration (for the characteristic) (NR 668.40) or the UTS (for the UHCs) (NR 668.48) before it can be placed on the ground.
Management of Contaminated Soils	WAC NR 718	Establishes minimum standards for the storage, transportation, treatment, and disposal of contaminated soil and certain other solid wastes excavated during response actions.	Soil/ Sediment/ Concrete	A	A	A	A	Standards will be followed during construction activities that manage contaminated soils.
Sites with Residual Contamination	Wis. Stat. § 292.12(b)	This regulation provides notification about residual contamination or other continuing obligations on a property.	Soil/ Sediment/ Concrete/ Groundwater				TBC	This is potentially to be considered if residual PCBs are left on the Site.
Historic Landfill	WDNR 2013	WDNR's Remediation and Redevelopment and Waste and Materials Management programs have jointly developed a process and guidance for development on historic fill sites and licensed landfills.	Soil		TBC			Guidance may be considered given historic fill area in Amcast South.

Table 11
Applicable or Relevant and Appropriate Requirements
Record of Decision
Amcast Industrial Corporation Superfund Site

				ARAR/TBC Determination by Area				
Requirement	**Citation**	**Description**	**Media**	**Amcast North**	**Amcast South**	**Residential Yards**	**Wilshire & Quarry Ponds**	**Comment**
Enlargement and Protection of Waterways	Wis. Stat. § 30.19	Specifies requirements for permits when conducting construction activities on navigable waterways.	Sediment/ Soil				A	Applicable to Wilshire Pond if berm removal and reconstruction takes place; substantive requirements of permit will be complied with though a permit will not be required per CERCLA §121(e)(1).
Removal of Material from Beds of Navigable Waters	Wis. Stat. § 30.20	Specifies requirements for permits when conducting dredging activities in navigable waters.	Sediment				A	Applicable to Quarry and Wilshire Ponds; substantive requirements of permit will be complied with though a permit will not be required per CERCLA §121(e)(1).
Ponds and Artificial Waterways	WAC NR 343	Specifies permit requirements for construction activities taking place in ponds and artificial waterways.	Sediment/ Soil				A	Applicable to Quarry and Wilshire Ponds; substantive requirements of permit will be complied with though a permit will not be required per CERCLA §121(e)(1).
Dredging in Navigable Waterways	WAC NR 345.04	Specifies permit requirements for dredging activities navigable waterways.	Sediment				A	Applicable to Quarry and Wilshire Ponds; substantive requirements of permit will be complied with though a permit will not be required per CERCLA §121(e)(1).
Location-specific ARARs								
US Fish and Wildlife Coordination Act	16 USC 661	The purpose is to protect fish and wildlife when federal actions result in the control or structural modification of a water body. Federal agencies may take action to prevent loss or damage to fish and wildlife resources.	N/A				R/A	Consultation is administrative and not required for onsite actions. However, expertise resides within the U.S. Fish and Wildlife Service, so substantitive requirements may be met through informal consultation.
EPA Guidance - OSWER	OSWER Directive 9355.7-04, May 1995	Land Use in CERCLA Remedy Selection Process. Identifies considerations for incorporating anticipated future land use in the remedy selection process.	N/A	TBC	TBC			Provides guidance for consideration of future site land use in selection of a site remedy.
Migratory Bird Treaty Act of 1972	16 USC 703-712	Prohibits the taking, possessing, buying, selling, or bartering of any migratory bird, including feathers, or other parts, nest eggs, or products, except as allowed by regulations. This includes disturbing nesting birds.	N/A	A	A	A	A	Applicable if migratory birds are identified during the action. Migratory birds are known to pass over the area, although no nesting habitats are believed to exist in the four area/sites. If migratory birds, their nests, or eggs are discovered, the design will specify measures to minimize disturbance.
Endangered Species Act of 1973 16 USC §1531 et seq.	50 CFR 200	Requires that federal agencies ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat.	N/A	A	A	A	A	No endangered species are known to be present that would be affected by remedial activities. Applicable if listed species or critical habitat is identified.

A: Applicable
ARAR: Applicable or Relevant and Appropriate Requirement
CFR: Code of Federal Regulations
NR: Natural Resources
N/A: Not Applicable
R/A: Relevant and Appropriate
TBC: To Be Considered
USC: United States Code
WAC: Wisconsin Administrative Code
Wis. Stat.: Wisconsin Statute

Table 12.1
Amcast North Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

AMCAST NORTH
Concrete Sampling and Pressure Washing/Removal, Excavation, Offsite Disposal, Backfill and Site Restoration

Amcast North Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 1,841,802**
	Pre-Construction and Mobilization					**$ 232,823**
1	Mobilization	4.0	each	$ 3,068.00	$ 4,045.60	$ 16,182
2	Site Preparation (Clearing, Grubbing, Trimming)	12,111.0	sy	$ 1.12	$ 1.48	$ 17,887
3	Decontamination Pad (20 x 40 asphalt sloped to sump)	800.0	sf	$ 15.20	$ 20.04	$ 16,035
4	Traffic Control Signage	1	ls	$ 8,260.00	$ 10,892.00	$ 10,892
5	Construction Survey	2.0	each	$ 2,277.00	$ 3,002.55	$ 6,005
6	Miscellaneous Equipment and Supplies	1.0	ls	$ 1,879.00	$ 2,477.73	$ 2,478
7	Site Trailer and Utilities	4.0	mo	$ 2,303.00	$ 3,036.84	$ 12,147
8	Electrical Connection Allowance	400.0	lf	$ 93.49	$ 123.28	$ 49,312
9	Erosion Control and Perimeter Fencing	1.0	ls	$ 18,957.00	$ 24,997.54	$ 24,998
10	Dust Control	4.0	mo	$ 8,308.00	$ 10,955.30	$ 43,821
11	Submittals	1.0	lot	$ 25,076.00	$ 33,066.32	$ 33,066
	Pre-Construction Activities					**$ 44,299**
12	Pre-Construction Sampling	45.0	each	$ 746.55	$ 984.43	$ 44,299
	Soil Removal and Backfill					**$ 625,365**
13	Demolish Bituminous Pavement	5,022	sy	$ 11.94	$ 15.74	$ 79,069
14	Demolish Concrete Slab	1,200	sy	$ 34.38	$ 36.00	$ 43,200
15	Miscellaneous Equipment Handling	80	hr	$ 242.00	$ 319.11	$ 25,529
16	Excavation, 3/4 CY Hydraulic Excavator	5,219.0	cy	$ 15.81	$ 20.85	$ 108,804
17	Loading into Truck - Landfill	5,219.0	cy	$ 6.00	$ 7.91	$ 41,292
18	Soil Double Handle - Excavation to Stockpile to Truck	522.0	cy	$ 35.00	$ 46.15	$ 24,092
19	Shoring for Excavations	1,770.0	sf	$ 33.77	$ 44.53	$ 78,819
20	Air Monitoring Station	4.0	mo	$ 1,246.00	$ 1,643.03	$ 6,572
21	Backfill Material	5,219.0	cy	$ 25.68	$ 33.86	$ 176,730
22	Compaction Equipment	140.0	hr	$ 174.67	$ 230.33	$ 32,246
23	Compaction Testing	2.0	wk	$ 3,417.00	$ 4,505.81	$ 9,012
	Confirmation Sampling					**$ 33,853**
24	Sample Collection	10.0	day	$ 1,170.00	$ 1,542.81	$ 15,428
25	PID, per day	10.0	day	$ 81.02	$ 106.84	$ 1,068
26	PCBs, soil analysis	30.0	each	$ 163.35	$ 215.40	$ 6,462
27	Metals, soil analysis	30.0	each	$ 166.62	$ 219.71	$ 6,591
28	Polynuclear aromatic hydrocarbons, soil analysis	30.0	each	$ 93.66	$ 123.50	$ 3,705
29	Sample Jars	90.0	each	$ 5.05	$ 6.66	$ 599
	Transportation and Offsite Disposal					**$ 588,345**
30	Transport Soil <50ppm PCBs to Subtitle D Landfill	7,228.0	ton	$ 15.00	$ 19.78	$ 142,967
31	Dispose of Soil <50ppm PCBs at Subtitle D Landfill	7,228.0	ton	$ 32.00	$ 42.20	$ 304,997
32	Transport Soil >50ppm PCBs to TSCA Landfill	78.0	ton	$ 229.28	$ 302.34	$ 23,582
33	Disposal of Soil >50ppm PCBs at TSCA Landfill	78.0	ton	$ 88.33	$ 116.48	$ 9,085
34	Characterization Sampling of Soil Prior to Transport	17.0	each	$ 1,283.00	$ 1,691.82	$ 28,761
35	Transportation and Disposal of Debris to Subtitle D Landfill	732.0	ton	$ 44.00	$ 58.02	$ 42,471
36	Contact Water Disposal	0.0	gal	$ -	$ -	$ -
37	32 Ft. Dump Truck Disposal Liner, 6 Mil	522.0	each	$ 53.00	$ 69.89	$ 36,482
	Site Restoration					**$ 326,188**
38	Removal of Decon Pad	800.0	sf	$ 5.52	$ 7.28	$ 5,823
39	Topsoil and Seed	7089.0	sy	$ 9.35	$ 12.33	$ 87,403
40	Gravel (Road Stone)	1116.0	cy	$ 155.00	$ 204.39	$ 228,099
41	Erosion Control	742.0	lf	$ 4.97	$ 6.55	$ 4,863
	Demobilization and Closeout					**$ 63,661**
42	Record Drawings/Topo Information	1.0	ls	$ 2,058.00	$ 2,713.77	$ 2,714
43	Subcontract Project Closeout	1.0	ls	$ 26,661.00	$ 35,156.37	$ 35,156
44	Demobilize Equipment	1.0	ls	$ 19,559.00	$ 25,791.36	$ 25,791

Construction Subtotal		**$ 1,899,767**
Contingency (15%)		$ 284,965
Construction Total		**$ 2,184,732**
Prime Contractor Markup (8%)	lump sum	$ 174,779
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 43,695
Engineering Design (6%)	lump sum	$ 131,084
Project Management and Field Oversight (25%)	lump sum	$ 546,183
Total Estimated Capital Cost (FY 2022 Dollars)		**$ 3,080,493**

Amcast North Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					

Table 12.1
Amcast North Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

Amcast North		
Costs Summary		
Source	**Description**	**Total**
Table C-2	Capital Costs	$ 3,080,493
Table C-3	Operation and Maintenance	$ -
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$ 3,080,493**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.2
Residential Yards Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

RESIDENTIAL YARDS
Soil Excavation, Offsite Disposal, Backfill, and Site Restoration

Residential Yards						
Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 2,339,371**
	Mobilization/Demobilization					**$ 337,520**
1	Mobilization	4.0	each	$ 5,081.00	$ 6,700.03	$ 26,800
2	Site Preparation (Clearing, Grubbing, Trimming)	7,464.0	sy	$ 9.95	$ 13.12	$ 97,931
3	Decontamination Pad (20 x 40 asphalt sloped to sump)	800.0	sf	$ 15.20	$ 20.04	$ 16,035
4	Traffic Control Signage	1	ls	$ 8,260.00	$ 10,892.00	$ 10,892
5	Construction Survey	2.0	each	$ 3,303.00	$ 4,355.48	$ 8,711
6	Miscellaneous Equipment and Supplies	1.0	ls	$ 3,186.00	$ 4,201.20	$ 4,201
7	Site Trailer and Utilities	7.0	mo	$ 1,664.00	$ 2,194.22	$ 15,360
8	Electrical Connection Allowance	1.0	ls	$ 37,397.00	$ 49,313.34	$ 49,313
9	Erosion Control and Perimeter Fencing	1.0	ls	$ 25,299.00	$ 33,360.38	$ 33,360
10	Dust Control	7.0	mo	$ 4,534.00	$ 5,978.73	$ 41,851
11	Submittals	1.0	lot	$ 25,076.00	$ 33,066.32	$ 33,066
	Pre-Construction Activities					**$ 202,134**
12	Access Agreements	17.0	each	$ 4,521.00	$ 5,961.59	$ 101,347
13	Property Sketches	17.0	each	$ 2,633.00	$ 3,471.99	$ 59,024
14	Pre-Construction Sampling	17.0	each	$ 1,863.00	$ 2,456.63	$ 41,763
	Soil Removal and Backfill					**$ 539,622**
15	Miscellaneous Soil Handling	120	hrs	$ 241.51	$ 318.47	$ 38,216
16	Tree Removal	17	each	$ 1,000.00	$ 1,318.64	$ 22,417
17	Excavation, 3/4 CY Hydraulic Excavator	4,976.0	cy	$ 15.81	$ 20.85	$ 103,738
18	Soil Double Handle - Excavation to Stockpile to Truck	2,488.0	cy	$ 35.00	$ 46.15	$ 114,828
19	Loading into Truck	4,976.0	cy	$ 6.00	$ 7.91	$ 39,369
20	Visual Warning Barrier	12,900.0	sy	$ 0.44	$ 0.58	$ 7,485
21	Air Monitoring Station	6.0	mo	$ 1,246.00	$ 1,643.03	$ 9,858
22	Backfill Material	4,976.0	cy	$ 25.68	$ 33.86	$ 168,501
23	Compaction Equipment	80.0	hr	$ 174.67	$ 230.33	$ 18,426
24	Compaction Testing	1.0	ls	$ 12,728.00	$ 16,783.70	$ 16,784
	Confirmation Sampling					**$ 42,442**
25	Sample Collection	20.0	day	$ 1,056.77	$ 1,393.50	$ 27,870
26	PID, per day	20.0	day	$ 81.02	$ 106.84	$ 2,137
27	PCBs, soil analysis	56.0	each	$ 163.35	$ 215.40	$ 12,062
28	Sample Jars	56.0	each	$ 5.05	$ 6.66	$ 373
	Transportation and Offsite Disposal					**$ 666,877**
29	Transport Soil <50ppm PCBs to Subtitle D Landfill	7339.0	ton	$ 15.00	$ 19.78	$ 145,163
30	Dispose of Soil <50ppm PCBs at Subtitle D Landfill	7339.0	ton	$ 32.00	$ 42.20	$ 309,681
31	Transport Soil >50ppm PCBs to TSCA Landfill	374.0	ton	$ 229.28	$ 302.34	$ 113,075
32	Disposal of Soil >50ppm PCBs at TSCA Landfill	374.0	ton	$ 88.33	$ 116.48	$ 43,562
33	Characterization Sampling of Soil Prior to Transport	12.0	each	$ 1,283.00	$ 1,691.82	$ 20,302
34	Transportation and Disposal of Debris to Subtitle D Landfill	5.0	ton	$ 44.00	$ 58.02	$ 290
35	Contact Water Disposal	0.0	gal	$ -	$ -	$ -
36	32 Ft. Dump Truck Disposal Liner, 6 Mil	498.0	each	$ 53.00	$ 69.89	$ 34,804
	Site Restoration					**$ 449,244**
37	Removal of Decon Pad	800.0	sf	$ 5.52	$ 7.28	$ 5,823
38	Sod	7464.0	sy	$ 24.06	$ 31.73	$ 236,807
39	Reestablish Yards	7464.0	sy	$ 9.52	$ 12.55	$ 93,699
40	Tree Replacement	17.0	each	$ 650.00	$ 857.12	$ 14,571
41	Replacing Shrubs and Plants - Per Property	17.0	each	$ 1,000.00	$ 1,318.64	$ 22,417
42	Watering (30 days)	17.0	each	$ 1,740.00	$ 2,294.44	$ 39,005
43	Miscellaneous Damage Control	1.0	ls	$ 28,000.00	$ 36,922.04	$ 36,922
	Demobilize Equipment					**$ 101,532**
44	Record Drawings/Topo Information	1.0	ls	$ 8,233.00	$ 10,856.40	$ 10,856
45	Subcontract Project Closeout	1.0	ls	$ 49,206.00	$ 64,885.21	$ 64,885
46	Demobilize Equipment	1.0	ls	$ 19,559.00	$ 25,791.36	$ 25,791

Construction Subtotal		**$ 2,339,371**
Contingency (15%)		$ 350,906
Construction Total		**$ 2,690,277**
Prime Contractor Markup (8%)	lump sum	$ 215,222
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 53,806
Engineering design (6%)	lump sum	$ 161,417
Project Management and Field Oversight (25%)	lump sum	$ 672,569
Total Estimated Capital Cost (FY 2022 Dollars)		**$ 3,793,290**

Table 12.2
Residential Yards Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

Residential Yards						
Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					$ -

Residential Yards		
Costs Summary		
Source	**Description**	**Total**
Table C-12	Design and Construction	$ 3,793,290
Table C-13	Operation and Maintenance	$ -
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$ 3,793,290**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard	sf	Square feet
FY	fiscal year	sy	Square yards
gal	Gallon	wk	Week
hr	Hour		
lf	Linear feet		
ls	Lump sum		
mg/kg	Milligram per kilogram		
mo	Month		
PCB	Polychlorinated biphenyl		
PRG	Preliminary remediation goal		

Table 12.3
Amcast South Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

AMCAST SOUTH
Excavation, Offsite Disposal, Backfill, and Site Restoration

Amcast South Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 4,892,576**
	Mobilization/Demobilization					**$ 363,421**
1	Mobilization	1.0	ls	$ 12,273.00	$ 16,183.72	$ 16,184
2	Site Preparation (Clearing, Grubbing, Trimming)	8,367.00	sy	$ 9.02	$ 11.89	$ 99,519
3	Decontamination Pad (20 x 40 asphalt sloped to sump)	800.0	sf	$ 15.20	$ 20.04	$ 16,035
4	Traffic Control Signage	1.0	ls	$ 8,260.00	$ 10,892.00	$ 10,892
5	Construction Survey Crew	2.0	each	$ 3,303.00	$ 4,355.48	$ 8,711
6	Miscellaneous Equipment and Supplies	1.0	ls	$ 1,879.00	$ 2,477.73	$ 2,478
7	Site Trailer and Utilities	4.0	mo	$ 2,303.00	$ 3,036.84	$ 12,147
8	Electrical Connection Allowance	1.0	ls	$ 37,397.00	$ 49,313.34	$ 49,313
9	Erosion Control and Perimeter Fencing	1.0	ls	$ 17,977.00	$ 23,705.27	$ 23,705
10	Railroad Flaggers	4.0	mo	$ 16,466.00	$ 21,712.80	$ 86,851
11	Dust Control	4.0	mo	$ 857.00	$ 1,130.08	$ 4,520
12	Submittals	1.0	ls	$ 25,076.00	$ 33,066.32	$ 33,066
	Pre-Construction Activities					**$ 21,776**
13	Pre-construction Sampling	20.0	each	$ 825.69	$ 1,088.79	$ 21,776
	Soil Removal and Backfill					**$ 1,548,241**
14	Demolish Bituminous Pavement with Air Equipment	1,933	sy	$ 17.92	$ 23.63	$ 45,677
15	Miscellaneous Soil Handling	240	hr	$ 241.51	$ 318.47	$ 76,432
16	Excavation, 3/4 Hydraulic Excavator	14,793.0	cy	$ 15.81	$ 20.85	$ 308,401
17	Soil Double Handle - Excavation to Stock Pile to Truck	1,479.0	cy	$ 35.00	$ 46.15	$ 68,260
18	Loading into Truck	14,793.0	cy	$ 6.00	$ 7.91	$ 117,040
19	Shoring for Deep Excavations	7,590.0	sf	$ 27.05	$ 35.67	$ 270,730
20	Contact Water Disposal		gal		$ -	$ -
21	Air Monitoring Station	4.0	mo	$ 1,246.00	$ 1,643.03	$ 6,572
22	Backfill Material	14,793.0	cy	$ 25.68	$ 33.86	$ 500,932
23	Compaction	14,793.0	cy	$ 7.00	$ 9.23	$ 136,547
24	Compaction Testing	1.0	ls	$ 13,385.00	$ 17,650.05	$ 17,650
	Confirmation Sampling					**$ 50,264**
25	Sample Collection	20.0	day	$ 1,057.00	$ 1,393.81	$ 27,876
26	PID, Per Day	20.0	day	$ 81.02	$ 106.84	$ 2,137
27	PCBs, Soil Analysis	35.0	each	$ 163.35	$ 215.40	$ 7,539
28	Metals, Soil Analysis	35.0	each	$ 166.62	$ 219.71	$ 7,690
29	Polynuclear Aromatic Hydrocarbons, Soil Analysis	35.0	each	$ 93.66	$ 123.50	$ 4,323
30	Sample Jars	105.0	each	$ 5.05	$ 6.66	$ 699
	Transportation and Offsite Disposal					**$ 2,606,356**
31	Transport Soil <50 ppm PCBs to Subtitle D Landfill	20,710.0	ton	$ 15.00	$ 19.78	$ 409,637
32	Disposal Soil <50 ppm PCBs at Subtitle D Landfill	20,710.0	ton	$ 32.00	$ 42.20	$ 873,892
33	Transport Soil >50 ppm PCBs to TSCA Landfill	1,939.0	ton	$ 229.28	$ 302.34	$ 586,235
34	Disposal of Soil >50 ppm PCBs at TSCA Landfill	1,939.0	ton	$ 88.33	$ 116.48	$ 225,847
35	Characterization Sampling of Soil Prior to Transport	46.0	each	$ 1,283.00	$ 1,691.82	$ 77,824
36	Transport and Disposal of Debris to Subtitle D Landfill	5,680.0	ton	$ 44.00	$ 58.02	$ 329,556
37	32 Ft. Dump Truck Disposal Liner, 6 Mil	1479.0	each	$ 53.00	$ 69.89	$ 103,365
	Site Restoration					**$ 238,857**
38	Removal of Decon Pad	800.0	sf	$ 5.52	$ 7.28	$ 5,823
39	Topsoil and Seed	8367.0	sy	$ 9.35	$ 12.33	$ 103,159
40	Gravel (Road Stone)	1933.0	sy	$ 29.44	$ 38.82	$ 75,041
41	Erosion Control	8367.0	sy	$ 4.97	$ 6.55	$ 54,834
	Demobilization and Closeout					**$ 63,661**
42	Record Drawings/Topo Information	1.0	ls	$ 2,058.00	$ 2,713.77	$ 2,714
43	Subcontract Project Closeout	1.0	ls	$ 26,661.00	$ 35,156.37	$ 35,156
44	Demobilize Equipment	1.0	ls	$ 19,559.00	$ 25,791.36	$ 25,791

Construction Subtotal		**$ 4,892,576**
Contingency (15%)		$ 733,886
Construction Total		**$ 5,626,462**
Prime Contractor Markup (8%)	lump sum	$ 450,117
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 112,529
Engineering design (6%)	lump sum	$ 337,588
Project Management and Field Oversight (25%)	lump sum	$ 1,406,616
Total Estimated Capital Cost (FY 2022 Dollars)		**$ 7,933,312**

Table 12.3
Amcast South Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

Amcast South						
Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					

Amcast South			
Costs Summary			
Source	**Description**	**Total**	
Table C-28	Design and Construction	$	7,933,312
Table C-29	Operation and Maintenance	$	-
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$**	**7,933,312**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard	sf	Square feet
FY	fiscal year	sy	Square yards
gal	Gallon	wk	Week
hr	Hour		
lf	Linear feet		
ls	Lump sum		
mg/kg	Milligram per kilogram		
mo	Month		
PCB	Polychlorinated biphenyl		
PRG	Preliminary remediation goal		

Table 12.4
Quarry Pond Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

QUARRY POND
Sediment Dredging to 1 mg/kg PCBs, Bank Soil Excavation, Offsite Disposal, Residual Management Layer, and Site Restoration

Quarry Pond						
Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 7,487,215**
	Mobilization/Demobilization					**$ 637,064**
1	Mobilization	1.0	ls	$ 225,000.00	$ 296,694.94	$ 296,695
2	Site Preparation (Clearing, Grubbing, Trimming)	656.00	sy	$ 20.00	$ 26.37	$ 17,301
3	Construction Offloading Area	1.0	ls	$ 125,000.00	$ 164,830.52	$ 164,831
4	Traffic Control Signage	1.0	ls	$ 3,000.00	$ 3,955.93	$ 3,956
5	Construction Survey Crew	2.0	each	$ 1,500.00	$ 1,977.97	$ 3,956
6	Miscellaneous Equipment and Supplies	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
7	Site Trailer and Utilities	4.0	mo	$ 3,000.00	$ 3,955.93	$ 15,824
8	Electrical Connection Allowance	1.0	ls	$ 50,000.00	$ 65,932.21	$ 65,932
9	Erosion Control and Perimeter Fencing	1.0	ls	$ 10,000.00	$ 13,186.44	$ 13,186
10	Dust Control	3.0	mo	$ 4,000.00	$ 5,274.58	$ 15,824
11	Submittals	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966
	Pre-Construction Activities					**$ 28,576**
12	Per Diem	5.0	day	$ 300.00	$ 395.59	$ 1,978
13	Vehicle Rental	5.0	day	$ 90.00	$ 118.68	$ 593
14	Sample Collection	5.0	day	$ 2,300.00	$ 3,032.88	$ 15,164
15	PCBs, Soil Analysis	30.0	each	$ 269.00	$ 354.72	$ 10,641
16	Sample Jars	30.0	each	$ 5.05	$ 6.66	$ 200
	Dewatering					**$ 26,373**
17	Sump	1	ls	$ 5,000.00	$ 6,593.22	$ 6,593
18	Sump Pump	3	mo	$ 5,000.00	$ 6,593.22	$ 19,780
	Bank Soil Excavation					**$ 174,987**
19	Excavation, 1 Cy Hydraulic Excavator, Med. Mat'l, 40 CY/HR	656	cy	$ 151.00	$ 199.12	$ 130,620
20	Loading of Soil into Truck	656	cy	$ 10.00	$ 13.19	$ 8,650
21	Backfill Material	656.0	cy	$ 25.68	$ 33.86	$ 22,214
22	Compaction Equipment	30.0	hr	$ 174.67	$ 230.33	$ 6,910
23	Compaction Testing	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
	Sediment Removal					**$ 2,488,718**
24	Sediment Dredging - Includes 1 Barge for Equipment and 2 Barges for Sediment	19,573.0	cy	$ 51.00	$ 67.25	$ 1,316,301
25	Furnish Sediment Solidification Additive and Complete Mixing Process	2,740.0	ton	$ 244.00	$ 321.75	$ 881,593
26	Loading of Sediments to the Trucks	21,681.0	cy	$ 10.00	$ 13.19	$ 285,895
27	Air Monitoring Station	3.0	mo	$ 1,246.00	$ 1,643.03	$ 4,929
	Confirmation Sampling					**$ 26,992**
28	Sample Collection	5.0	day	$ 2,300.00	$ 3,032.88	$ 15,164
29	PCBs, Soil Analysis	30.0	each	$ 269.00	$ 354.72	$ 10,641
30	PID, Per Day	5.0	day	$ 180.00	$ 237.36	$ 1,187
	Installation of Residual Management Layer					**$ 382,640**
31	Bulk GAC Material	20.4	cy	$ 1,264.28	$ 1,667.14	$ 34,010
32	Sand Material	2,017.1	cy	$ 24.00	$ 31.65	$ 63,836
33	Transporatation of Sand/GAC Material	2,037.5	cy	$ 6.00	$ 7.91	$ 16,120
34	Placement of Sand/GAC Material	2,037.5	cy	$ 100.00	$ 131.86	$ 268,674
	Transportation and Offsite Disposal					**$ 3,469,512**
31	Transport Soil <50 ppm PCBs to Subtitle D Landfill	27,623.0	ton	$ 15.00	$ 19.78	$ 546,374
32	Disposal Soil <50 ppm PCBs at Subtitle D Landfill	27,623.0	ton	$ 32.00	$ 42.20	$ 1,165,597
33	Transport Soil >50 ppm PCBs to TSCA Landfill	3,530.0	ton	$ 229.28	$ 302.34	$ 1,067,256
34	Disposal of Soil >50 ppm PCBs at TSCA Landfill	3,530.0	ton	$ 88.33	$ 116.48	$ 411,160
35	Characterization Sampling of Soil Prior to Transport	62.0	each	$ 1,283.00	$ 1,691.82	$ 104,893
36	Transport and Disposal of Debris to Subtitle D Landfill	312.0	ton	$ 44.00	$ 58.02	$ 18,102
37	32 Ft. Dump Truck Disposal Liner, 6 Mil	2234.0	each	$ 53.00	$ 69.89	$ 156,130
	Site Restoration					**$ 52,578**
38	Removal of Decon Pad	800.0	sf	$ 5.52	$ 7.28	$ 5,823
39	Topsoil and Seed	656.0	sy	$ 9.35	$ 12.33	$ 8,088
40	Erosion Control	5900.0	sf	$ 4.97	$ 6.55	$ 38,667
	Demobilization and Closeout					**$ 199,775**
41	Record Drawings/Topo Information	1.0	ls	$ 1,500.00	$ 1,977.97	$ 1,978
42	Subcontract Project Closeout	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966
43	Demobilize Equipment	1.0	ls	$ 125,000.00	$ 164,830.52	$ 164,831

Construction Subtotal		**$ 7,487,215**
Contingency (15%)		$ 1,123,082
Construction Total		**$ 8,610,297**
Prime Contractor Markup (8%)	lump sum	$ 688,824
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 172,206
Engineering design (6%)	lump sum	$ 516,618

Table 12.4
Quarry Pond Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

Project Management and Field Oversight (25%)	lump sum	$	2,152,574
Total Estimated Capital Cost (FY 2022 Dollars)		**$**	**12,140,519**

Table 12.4
Quarry Pond Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

Quarry Pond						
Operation and Maintenance Cost						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					

Quarry Pond		
Cost Summary		
Source	**Description**	**Total**
Table C-38	Design and Construction	$ 12,140,519
Table C-39	Operation and Maintenance	$ -
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$ 12,140,519**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.5
Wilshire Pond Cost Estimate - Berms Left in Place
Amcast Industrial Superfund Site Cedarburg, Wisconsin

WILSHIRE POND
Sediment and Bank Soil Excavation, Structural Excavation, Offsite Disposal, Backfill, Site Restoration, and Installation of Residual Management Layer (Berms Left in Place)

Table C-15						
Alternative WP-2 Capital Cost						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 1,148,255**
	Mobilization/Demobilization					**$ 205,288**
1	Mobilization	1.0	ls	$ 33,170.00	$ 43,739.43	$ 43,739
2	Site Preparation (Clearing, Grubbing, Trimming)	0.78	ac	$ 8,500.00	$ 11,208.48	$ 8,743
3	Decontamination Pad (20 x 40 asphalt sloped to sump)	1.0	ls	$ 22,000.00	$ 29,010.17	$ 29,010
4	Traffic Control Signage	1	ls	$ 3,000.00	$ 3,955.93	$ 3,956
5	Construction Survey Crew	2.0	each	$ 1,500.00	$ 1,977.97	$ 3,956
6	Miscellaneous Equipment and Supplies	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
7	Site Trailer and Utilities	2.0	mo	$ 3,000.00	$ 3,955.93	$ 7,912
8	Electrical Connection Allowance	1.0	ls	$ 50,000.00	$ 65,932.21	$ 65,932
9	Erosion Control and Perimeter Fencing	1.0	ls	$ 10,000.00	$ 13,186.44	$ 13,186
10	Dust Control	2.0	mo	$ 4,000.00	$ 5,274.58	$ 10,549
11	Submittals	1.0	ls	$ 8,882.00	$ 11,712.20	$ 11,712
	Pre-Construction Activities					**$ 28,576**
12	Per Diem	5.0	day	$ 300.00	$ 395.59	$ 1,978
13	Vehicle Rental	5.0	day	$ 90.00	$ 118.68	$ 593
14	Sample Collection	5.0	day	$ 2,300.00	$ 3,032.88	$ 15,164
15	PCBs, Soil Analysis	30.0	each	$ 269.00	$ 354.72	$ 10,641
16	Sample Jars	30.0	each	$ 5.05	$ 6.66	$ 200
	Dewatering and Water Treatment					**$ 286,415**
17	Sump	1	ls	$ 5,000.00	$ 6,593.22	$ 6,593
18	Sump Pump	2	mo	$ 5,000.00	$ 6,593.22	$ 13,186
19	Mob/Demob System	1	ls	$ 32,000.00	$ 42,196.61	$ 42,197
20	Water Treatment System Rental	2	mo	$ 21,000.00	$ 27,691.53	$ 55,383
21	O&M Cost per Gallon	481,554	gal	$ 0.26	$ 0.34	$ 165,100
22	Discharge Monitoring and Reporting	2	mo	$ 1,500.00	$ 1,977.97	$ 3,956
	Soil Removal and Backfill					**$ 100,331**
23	Mechanical Dredging of Non-TSCA Sediment	1,348	cy	$ 45.00	$ 59.34	$ 79,989
24	Mechanical Dredging of TSCA Sediment	89	cy	$ 45.00	$ 59.34	$ 5,281
25	Loading into Truck	1,437.0	cy	$ 6.00	$ 7.91	$ 11,369
26	Air Monitoring Station	2.0	mo	$ 1,400.00	$ 1,846.10	$ 3,692
	Confirmation Sampling					**$ 16,514**
27	Sample Collection	3.0	day	$ 2,300.00	$ 3,032.88	$ 9,099
28	PCBs, soil analysis	20.0	each	$ 269.00	$ 354.72	$ 7,094
29	PID, per day	3.0	day	$ 81.02	$ 106.84	$ 321
	Transportation and Offsite Disposal					**$ 234,605**
30	Transport Soil <50 ppm PCBs to Subtitle D Landfill	1,887.0	ton	$ 15.00	$ 19.78	$ 37,324
31	Disposal Soil <50 ppm PCBs at Subtitle D Landfill	1,887.0	ton	$ 32.00	$ 42.20	$ 79,625
32	Transport Soil >50 ppm PCBs to TSCA Landfill	124.0	ton	$ 229.28	$ 302.34	$ 37,490
33	Disposal of Soil >50 ppm PCBs at TSCA Landfill	124.0	ton	$ 88.33	$ 116.48	$ 14,443
34	Reagent Mixing, Stabilization Non-TSCA Sediment	1,887.0	ton	$ 18.00	$ 23.74	$ 44,789
35	Reagent Mixing, Stabilization of Non-TSCA Sediment	124.0	ton	$ 18.00	$ 23.74	$ 2,943
36	Characterization Sampling of Soil Prior to Transport	4.0	each	$ 1,283.00	$ 1,691.82	$ 6,767
37	Transport and Disposal of Debris to Subtitle D Landfill	20.0	ton	$ 44.00	$ 58.02	$ 1,160
38	32 Ft. Dump Truck Disposal Liner, 6 Mil	144.0	each	$ 53.00	$ 69.89	$ 10,064
	Site Restoration					**$ 67,429**
39	Removal of Decon Pad	80.0	sf	$ 5.52	$ 7.28	$ 582
40	Erosion Control	10200.0	sf	$ 4.97	$ 6.55	$ 66,847
	Habitat Restoration					**$ 141,187**
41	Plantings	2040.0	each	$ 50.00	$ 65.93	$ 134,502
42	Erosion Control	1020.0	sf	$ 4.97	$ 6.55	$ 6,685
	Demobilization and Closeout					**$ 67,910**
43	Record Drawings/Topo Information	1.0	ls	$ 1,500.00	$ 1,977.97	$ 1,978
44	Subcontract Project Closeout	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966
45	Demobilize Equipment	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966

Construction Subtotal			**$ 1,148,255**
Contingency (15%)			$ 172,238
Construction Total			**$ 1,320,493**
Prime Contractor Markup (8%)	lump sum		$ 105,639
Payment/Performance Bonds and Insurance (2%)	lump sum		$ 26,410
Engineering design (6%)	lump sum		$ 79,230
Project Management and Field Oversight (25%)	lump sum		$ 330,123

Table 12.5
Wilshire Pond Cost Estimate - Berms Left in Place
Amcast Industrial Superfund Site Cedarburg, Wisconsin

Total Estimated Capital Cost (FY 2022 Dollars)	**$ 1,861,895**

Table C-16						
Alternative WP-2 Operation and Maintenance						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					

Table C-17		
Alternative WP-2 Summary		
Source	**Description**	**Subtotal**
Table C-15	Design and Construction	$ 1,861,895
Table C-16	Operation and Maintenance	$ -
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$ 1,861,895**

Notes:

Unit prices from CH2M cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.6
Wilshire Pond Cost Estimate - Berms Removed
Amcast Industrial Superfund Site Cedarburg, Wisconsin

WILSHIRE POND
Sediment and Bank Soil Excavation, Structural Excavation, Offsite Disposal, Backfill, Site Restoration, and Installation of Residual Management Layer (Berms Removed)

Wilshire Pond						
Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Construction Subtotal					**$ 1,389,042**
	Pre-Construction and Mobilization					**$ 206,199**
1	Mobilization	1.0	ls	$ 33,170.00	$ 43,739.43	$ 43,739
2	Site Preparation (Clearing, Grubbing, Trimming)	0.78	ac	$ 8,500.00	$ 11,208.48	$ 8,743
3	Decontamination Pad (20 x 40 asphalt sloped to sump)	1.0	ls	$ 22,000.00	$ 29,010.17	$ 29,010
4	Traffic Control Signage	1.0	ls	$ 3,000.00	$ 3,955.93	$ 3,956
5	Construction Survey Crew	2.0	each	$ 1,500.00	$ 1,977.97	$ 3,956
6	Miscellaneous Equipment and Supplies	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
7	Site Trailer and Utilities	2.0	mo	$ 3,000.00	$ 3,955.93	$ 7,912
8	Electrical Connection Allowance	1.0	ls	$ 50,000.00	$ 65,932.21	$ 65,932
9	Erosion Control and Perimeter Fencing	1.0	ls	$ 10,000.00	$ 13,186.44	$ 13,186
10	Dust Control	2.0	mo	$ 4,000.00	$ 5,274.58	$ 10,549
11	Submittals	1.0	ls	$ 9,573.00	$ 12,623.38	$ 12,623
	Pre-Construction and Mobilization					**$ 28,576**
12	Per Diem	5.0	day	$ 300.00	$ 395.59	$ 1,978
13	Vehicle Rental	5.0	day	$ 90.00	$ 118.68	$ 593
14	Sample Collection	5.0	day	$ 2,300.00	$ 3,032.88	$ 15,164
15	PCBs, Soil Analysis	30.0	each	$ 269.00	$ 354.72	$ 10,641
16	Sample Jars	30.0	each	$ 5.05	$ 6.66	$ 200
	Dewatering and Water Treatment					**$ 286,415**
17	Sump	1	ls	$ 5,000.00	$ 6,593.22	$ 6,593
18	Sump Pump	2	mo	$ 5,000.00	$ 6,593.22	$ 13,186
19	Mob/Demob System	1	ls	$ 32,000.00	$ 42,196.61	$ 42,197
20	Water Treatment System Rental	2	mo	$ 21,000.00	$ 27,691.53	$ 55,383
21	O&M Cost per Gallon	481,554	gal	$ 0.26	$ 0.34	$ 165,100
22	Discharge Monitoring and Reporting	2	mo	$ 1,500.00	$ 1,977.97	$ 3,956
	Soil Removal and Backfill					**$ 158,593**
23	Mechanical Dredging of Non-TSCA Sediment	1,859	cy	$ 45.00	$ 59.34	$ 110,311
24	Mechanical Dredging of TSCA Sediment	89	cy	$ 45.00	$ 59.34	$ 5,281
25	Loading into Truck	1,948.0	cy	$ 6.00	$ 7.91	$ 15,412
26	Air Monitoring Station	2.0	mo	$ 1,400.00	$ 1,846.10	$ 3,692
27	Import Backfill and Grading	511.0	cy	$ 25.68	$ 33.86	$ 17,304
28	Compaction Testing	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
	Confirmation Sampling					**$ 16,514**
29	Sample Collection	3.0	day	$ 2,300.00	$ 3,032.88	$ 9,099
30	PCBs, soil analysis	20.0	each	$ 269.00	$ 354.72	$ 7,094
31	PID, per day	3.0	day	$ 81.02	$ 106.84	$ 321
	Installation of Residual Management Layer					**$ 63,022**
32	Bulk GAC Material	3.4	cy	$ 1,264.28	$ 1,667.14	$ 5,668
33	Sand Material	331.8	cy	$ 24.00	$ 31.65	$ 10,501
34	Transporatation of Sand/GAC Material	335.2	cy	$ 6.00	$ 7.91	$ 2,652
35	Placement of Sand/GAC Material	335.2	cy	$ 100.00	$ 131.86	$ 44,201
	Transportation and Offsite Disposal					**$ 353,197**
32	Transport Soil <50 ppm PCBs to Subtitle D Landfill	3,161.0	ton	$ 15.00	$ 19.78	$ 62,524
33	Disposal Soil <50 ppm PCBs at Subtitle D Landfill	3,161.0	ton	$ 32.00	$ 42.20	$ 133,383
34	Transport Soil >50 ppm PCBs to TSCA Landfill	124.0	ton	$ 229.28	$ 302.34	$ 37,490
35	Disposal of Soil >50 ppm PCBs at TSCA Landfill	124.0	ton	$ 88.33	$ 116.48	$ 14,443
36	Reagent Mixing, Stabilization Non-TSCA Sediment	3,161.0	ton	$ 18.00	$ 23.74	$ 75,028
37	Reagent Mixing, Stabilization of Non-TSCA Sediment	124.0	ton	$ 18.00	$ 23.74	$ 2,943
38	Characterization Sampling of Soil Prior to Transport	7.0	each	$ 1,283.00	$ 1,691.82	$ 11,843
39	Transport and Disposal of Debris to Subtitle D Landfill	33.0	ton	$ 44.00	$ 58.02	$ 1,915
40	32 Ft. Dump Truck Disposal Liner, 6 Mil	195.0	each	$ 53.00	$ 69.89	$ 13,628
	Site Restoration					**$ 67,429**
41	Removal of Decon Pad	80.0	sf	$ 5.52	$ 7.28	$ 582
42	Erosion Control	10200.0	sf	$ 4.97	$ 6.55	$ 66,847
	Habitat Restoration					**$ 141,187**
43	Plantings	2040.0	each	$ 50.00	$ 65.93	$ 134,502
44	Erosion Control	1020.0	sf	$ 4.97	$ 6.55	$ 6,685
	Demobilization and Closeout					**$ 67,910**
45	Record Drawings/Topo Information	1.0	ls	$ 1,500.00	$ 1,977.97	$ 1,978
46	Subcontract Project Closeout	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966
47	Demobilize Equipment	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966

Construction Subtotal		**$ 1,389,042**
Contingency (15%)		$ 208,356
Construction Total		**$ 1,597,398**
Prime Contractor Markup (8%)	lump sum	$ 127,792
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 31,948

Table 12.6
Wilshire Pond Cost Estimate - Berms Removed
Amcast Industrial Superfund Site Cedarburg, Wisconsin

Engineering design (6%)	lump sum	$	95,844
Project Management and Field Oversight (25%)	lump sum	$	399,350
Total Estimated Capital Cost (FY 2022 Dollars)		**$**	**2,252,332**

Table 12.6
Wilshire Pond Cost Estimate - Berms Removed
Amcast Industrial Superfund Site Cedarburg, Wisconsin

Wilshire Pond						
Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					

Wilshire Pond			
Cost Summary			
Source	**Description**		**Subtotal**
Table C-18	Design and Construction	$	2,252,332
Table C-19	Operation and Maintenance	$	-
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$**	**2,252,332**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.7
North Storm Sewers Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

NORTH STORM SEWERS

Abandon Amcast North Building Storm Sewers, Remove Non-Building Storm Sewer Piping, Excavation and Backfill, Pressure Wash Non-Building Storm Sewers, Offsite Disposal, and Site Restoration

North Storm Sewers						
Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 1,925,915**
	Mobilization/Demobilization					**$ 247,504**
1	Subcontractor Submittals	4.0	each	$ 1,500.00	$ 1,977.97	$ 7,912
2	Mobilization/Demobilization of Cleaning and Treatment Equipment	1.00	ls	$ 100,000.00	$ 131,864.42	$ 131,864
3	Decontamination Pad (50 x 50 Bermed Asphalt Sloped to Sump)	2,500.0	sf	$ 8.50	$ 11.21	$ 28,021
4	Traffic Control Signage	1.0	ls	$ 2,000.00	$ 2,637.29	$ 2,637
5	Construction Survey Crew	2.0	day	$ 2,227.00	$ 2,936.62	$ 5,873
6	Site Trailer and Utilities	2.0	mo	$ 3,793.00	$ 5,001.62	$ 10,003
7	Electrical Connection Allowance	1.0	ls	$ 37,397.00	$ 49,313.34	$ 49,313
8	Erosion Control and Perimeter Fencing	1.0	ls	$ 7,510.00	$ 9,903.02	$ 9,903
9	Dust Control	1.0	mo	$ 1,500.00	$ 1,977.97	$ 1,978
	Pre-Construction Activities					**$ 14,572**
10	Private Utility Clearance	2.0	day	$ 2,500.00	$ 3,296.61	$ 6,593
11	Sample Collection	2.0	day	$ 2,015.00	$ 2,657.07	$ 5,314
12	PCBs, Soil Analysis	12.0	each	$ 163.35	$ 215.40	$ 2,585
13	Sample Jars	12.0	each	$ 5.05	$ 6.66	$ 80
	Storm Sewer Abandonment/Cleaning Under Building					**$ 332,996**
14	Building Structural Modification to Allow Work Inside	1	allow	$ 50,000.00	$ 65,932.21	$ 65,932
15	Mob/Demob Video Equipment, Reports	1	ls	$ 7,500.00	$ 9,889.83	$ 9,890
16	In-Line Video Inspection	5	day	$ 1,150.00	$ 1,516.44	$ 7,582
17	Clean Out and Pressure Wash Pipes Underneath Building	10	day	$ 9,150.00	$ 12,065.59	$ 120,656
18	Processing of Flush Water and Sediment	10	day	$ 5,500.00	$ 7,252.54	$ 72,525
19	Plugging of Lines after Cleaning	5	day	$ 7,500.00	$ 9,889.83	$ 49,449
20	Flowable Fill	48	cy	$ 110.00	$ 145.05	$ 6,962
	Onsite Storm Sewer Removal					**$ 62,440**
21	Excavate/Load 20 Feet of Pipe Onsite (not under building)	4	day	$ 9,426.16	$ 12,429.75	$ 49,719
22	Backfill Material Cost	71	ton	$ 25.00	$ 32.97	$ 2,341
23	Backfill Installation	1	day	$ 7,211.62	$ 9,509.56	$ 9,510
24	Confirmation Sampling	4	each	$ 165.00	$ 217.58	$ 870
	Storm Sewer Abandonment/Cleaning Outside of Building					**$ 972,499**
25	Mob/Demob Video Equipment, Reports	1	ls	$ 7,500.00	$ 9,889.83	$ 9,890
26	In-Line Video Inspection	10	day	$ 1,150.00	$ 1,516.44	$ 15,164
27	Clean Out and Pressure Wash Pipes Downgradient Sewers	10.0	day	$ 9,150.00	$ 12,065.59	$ 120,656
28	Processing of Flush Water and Sediment	10.0	day	$ 5,500.00	$ 7,252.54	$ 72,525
29	Epoxy Coating Lines after Cleaning	2,600.0	lf	$ 220.00	$ 290.10	$ 754,264
	Confirmation Sampling					**$ 19,736**
30	Sample Collection	10.0	each	$ 1,170.00	$ 1,542.81	$ 15,428
31	PCBs, Soil Analysis	20.0	each	$ 163.35	$ 215.40	$ 4,308
32	Sample Jars	20.0	each	$ 5.05	$ 6.66	$ 133
	Transportation and Offsite Disposal					**$ 173,511**
33	Characterization Sampling of Soil Prior to Transport	2.0	each	$ 1,000.00	$ 1,318.64	$ 2,637
34	Transport Solidified Sediment from Under Building <50ppm PCBs to Subtitle D Landfill	18.0	ton	$ 15.00	$ 19.78	$ 356
35	Dispose of Solidified Sediment from Under Building <50ppm PCBs at Subtitle D Landfill	18.0	ton	$ 32.00	$ 42.20	$ 760
36	Transport Solidified Sediment from Under Building >50ppm PCBs to TSCA Landfill	18.0	ton	$ 229.28	$ 302.34	$ 5,442
37	Dispose of Solidified Sediment from Under Building >50ppm PCBs at TSCA Landfill	18.0	ton	$ 88.33	$ 116.48	$ 2,097
38	Transport Solidified Sediment from Downgradient Pipelines <50ppm PCBs to Subtitle D Landfill	280.0	ton	$ 15.00	$ 19.78	$ 5,538
39	Dispose of Solidified Sediment from Downgradient Pipelines <50ppm PCBs at Subtitle D Landfill	280.0	ton	$ 32.00	$ 42.20	$ 11,815
40	Transport Solidified Sediment from Downgradient Pipelines >50ppm PCBs to TSCA Landfill	280.0	ton	$ 229.28	$ 302.34	$ 84,655
41	Dispose of Solidified Sediment from Downgradient Pipelines >50ppm PCBs at TSCA Landfill	280.0	ton	$ 88.33	$ 116.48	$ 32,613
42	Transport Excavated Soil and Pipeline >50ppm PCBs to TSCA Landfill	36.0	ton	$ 229.28	$ 302.34	$ 10,884
43	Dispose of Excavated Soil and Pipeline >50ppm PCBs at TSCA Landfill	36.0	ton	$ 88.33	$ 116.48	$ 4,193
44	Contact Water Disposal	30000.0	gal	$ 0.26	$ 0.34	$ 10,285
45	32 ft. Dump Truck Disposable Liner, 6 Mil	32.0	each	$ 53.00	$ 69.89	$ 2,236
	Site Restoration					**$ 62,965**
46	Clean Backfill	500.0	tmcy	$ 24.00	$ 31.65	$ 15,824
47	Concrete	100.0	cy	$ 250.00	$ 329.66	$ 32,966
48	Blacktop Paving	1000.0	sf	$ 8.50	$ 11.21	$ 11,208
49	Removal of Decon Pad	30.0	cy	$ 75.00	$ 98.90	$ 2,967
	Reports					**$ 39,559**
50	Record Drawings/Topo Information	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
51	Final Report	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966

Construction Subtotal		**$ 1,925,915**
Contingency (15%)		$ 288,887
Construction Total		**$ 2,214,802**
Prime Contractor Markup (8%)	lump sum	$ 177,184
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 44,296
Engineering design (6%)	lump sum	$ 132,888
Project Management and Field Oversight (25%)	lump sum	$ 553,701
Total Estimated Capital Cost (FY 2022 Dollars)		**$ 3,122,871**

Table 12.7
North Storm Sewers Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

North Storm Sewers						
Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Operation and Maintenance Subtotal					**$ -**
	None					

North Storm Sewers		
Cost Summary		
Source	**Description**	**Total**
Table C-48	Design and Construction	$ 3,122,871
Table C-49	Operation and Maintenance	$ -
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$ 3,122,871**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.8
South Storm Sewers Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

SOUTH STORM SEWERS
Remove Storm Sewer Piping, Excavation, Offsite Disposal, Backfill, and Site Restoration

South Storm Sewers						
Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Subtotal					**$ 2,653,847**
	Mobilization/Demobilization					**$ 249,152**
1	Subcontractor Submittals	4.0	each	$ 1,500.00	$ 1,977.97	$ 7,912
2	Mobilization/Demobilization of Cleaning and Treatment Equipment	1.00	ls	$ 100,000.00	$ 131,864.42	$ 131,864
3	Decontamination Pad (50 x 50 Bermed Asphalt Sloped to Sump)	2,500.0	sf	$ 9.00	$ 11.87	$ 29,669
4	Traffic Control Signage	1.0	ls	$ 2,000.00	$ 2,637.29	$ 2,637
5	Construction Survey Crew	2.0	day	$ 2,227.00	$ 2,936.62	$ 5,873
6	Site Trailer and Utilities	2.0	mo	$ 3,793.00	$ 5,001.62	$ 10,003
7	Electrical Connection Allowance	1.0	ls	$ 37,397.00	$ 49,313.34	$ 49,313
8	Erosion Control and Perimeter Fencing	1.0	ls	$ 7,510.00	$ 9,903.02	$ 9,903
9	Dust Control	1.0	mo	$ 1,500.00	$ 1,977.97	$ 1,978
	Pre-Construction Activities					**$ 21,085**
10	Private Utility Clearance	2.0	day	$ 2,500.00	$ 3,296.61	$ 6,593
11	Building Structural Assessment	40.0	hr	$ 125.00	$ 164.83	$ 6,593
12	Sample Collection	2.0	day	$ 2,015.00	$ 2,657.07	$ 5,314
13	PCBs, Soil Analysis	12.0	each	$ 163.35	$ 215.40	$ 2,585
	Storm Sewer Removal					**$ 240,750**
14	Excavation of Onsite Sewer	9	day	$ 9,426.16	$ 12,429.75	$ 111,868
15	Backfill of Onsite Sewer	11	day	$ 7,211.62	$ 9,509.56	$ 104,605
16	Plugging of Lines	2	day	$ 7,500.00	$ 9,889.83	$ 19,780
17	Flowable Fill	31	cy	$ 110.00	$ 145.05	$ 4,497
	Storm Sewer Cleaning					**$ 889,162**
18	Mob/Demob Video Equipment, Reports	1	ls	$ 7,500.00	$ 9,889.83	$ 9,890
19	In-Line Video Inspection	6	day	$ 1,150.00	$ 1,516.44	$ 9,099
20	Clean Out and Pressure Wash Pipes Downgradient Sewers	6	day	$ 9,150.00	$ 12,065.59	$ 72,394
21	Processing of Flush Water and Sediment	6	day	$ 5,500.00	$ 7,252.54	$ 43,515
22	Epoxy Coating Lines after Cleaning	2600	lf	$ 220.00	$ 290.10	$ 754,264
	Confirmation Sampling					**$ 87,911**
23	Sample Collection	50.0	each	$ 1,170.00	$ 1,542.81	$ 77,141
24	PCBs, Soil Analysis	50.0	each	$ 163.35	$ 215.40	$ 10,770
25	Sample Jars	50.0	each	$ 5.05	$ 6.66	$ 333
	Transportation and Offsite Disposal					**$ 878,767**
26	Characterization Sampling of Soil Prior to Transport	7.0	each	$ 1,000.00	$ 1,318.64	$ 9,231
27	Transport Solidified Sediment from Downgradient Pipelines <50ppm PCBs to Subtitle D Landfill	76.0	ton	$ 15.00	$ 19.78	$ 1,503
28	Dispose of Solidified Sediment from Downgradient Pipelines <50ppm PCBs at Subtitle D Landfill	76.0	ton	$ 32.00	$ 42.20	$ 3,207
29	Transport Solidified Sediment from Downgradient Pipelines >50ppm PCBs to TSCA Landfill	76.0	ton	$ 229.28	$ 302.34	$ 22,978
30	Dispose of Solidified Sediment from Downgradient Pipelines >50ppm PCBs at TSCA Landfill	76.0	ton	$ 88.33	$ 116.48	$ 8,852
31	Transport Excavated Soil/Pipe/Sediment from Onsite Pipelines <50 ppm to PCBs to Subtitle D Landfill	1,710.0	ton	$ 15.00	$ 19.78	$ 33,823
32	Dispose of Excavated Soil/Pipe/Sediment from Onsite Pipelines <50 ppm to PCBs at Subtitle D Landfill	1,710.0	ton	$ 32.00	$ 42.20	$ 72,156
33	Transport Excavated Soil/Pipe/Sediment from Onsite Pipelines >50 ppm to PCBs to TSCA Landfill	1,710.0	ton	$ 229.28	$ 302.34	$ 516,999
34	Dispose of Excavated Soil/Pipe/Sediment from Onsite Pipelines >50 ppm at PCBs to TSCA Landfill	1,710.0	ton	$ 88.33	$ 116.48	$ 199,174
35	Contact Water Disposal	30000.0	gal	$ 0.26	$ 0.34	$ 10,285
36	32 ft. Dump Truck Disposable Liner, 6 Mil	8.0	each	$ 53.00	$ 69.89	$ 559
	Site Restoration					**$ 247,128**
37	Clean Backfill	6699.0	tons	$ 24.00	$ 31.65	$ 212,006
38	Concrete	0.0	cy	$ -	$ -	$ -
39	Blacktop Paving	2500.0	sf	$ 8.50	$ 11.21	$ 28,021
40	Hydroseeding	28500.0	sf	$ 0.11	$ 0.15	$ 4,134
41	Removal of Decon Pad	30.0	cy	$ 75.00	$ 98.90	$ 2,967
	Reports					**$ 39,559**
42	Record Drawings/Topo Information	1.0	ls	$ 5,000.00	$ 6,593.22	$ 6,593
43	Final Report	1.0	ls	$ 25,000.00	$ 32,966.10	$ 32,966

Construction Subtotal		**$ 2,653,847**
Contingency (15%)		$ 398,077
Construction Total		**$ 3,051,924**
Prime Contractor Markup (8%)	lump sum	$ 244,154
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 61,038
Engineering design (6%)	lump sum	$ 183,115
Project Management and Field Oversight (25%)	lump sum	$ 762,981
Total Estimated Capital Cost (FY 2022 Dollars)		**$ 4,303,213**

Table 12.8
South Storm Sewers Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

South Storm Sewers						
Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
						$ -
	None					

South Storm Sewers			
Cost Summary			
Source	**Description**	**Subtotal**	**Total (Rounded)**
Table C-57	Design and Construction	$ 4,303,213	$ 4,303,000
Table C-58	Operation and Maintenance	$ -	$ -
	Total		**$ 4,303,213**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.9
Groundwater Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

GROUNDWATER INTERIM REMEDY
Institutional Controls and Groundwater Monitoring

Groundwater Interim Remedy						
Capital Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Groundwater Monitoring Subtotal					**$ 392,569**
	Groundwater Monitoring Program					**$ 92,987**
1	Existing Data Evaluation	1.0	ls	$ 29,374.00	$ 38,733.85	$ 38,734
2	Submittals	1.00	ls	$ 29,374.00	$ 38,733.85	$ 38,734
3	Review	1.0	ls	$ 11,769.00	$ 15,519.12	$ 15,519
	Monitoring Well Abandonment					**$ 1,846**
4	Monitoring Well Abandonment	2.0	each	$ 700.00	$ 923.05	$ 1,846
	Monitoring Well Installation					**$ 62,921**
5	Mobilization/Demobilization	1.0	ls	$ 5,461.00	$ 7,201.12	$ 7,201
6	Private Utility Locate	1.0	ls	$ 2,614.00	$ 3,446.94	$ 3,447
7	Hollow-Stem Auger Drilling (8.25" ID)	250.0	lf	$ 36.00	$ 47.47	$ 11,868
8	4-Inch PVC Well Casing	200.0	lf	$ 18.00	$ 23.74	$ 4,747
9	4-Inch Stainless Steel Well Screen (10")	50.0	lf	$ 57.75	$ 76.15	$ 3,808
10	Well Construction Materials (bentonite, sand, etc.)	250.0	lf	$ 29.36	$ 38.72	$ 9,679
11	Well Development	5.0	each	$ 286.45	$ 377.73	$ 1,889
12	Surveying	1.0	day	$ 2,051.00	$ 2,704.54	$ 2,705
13	Transport of Soil Cuttings to Subtitle D Landfill	16.0	ton	$ 15.00	$ 19.78	$ 316
14	Dispose of Soil Cuttings at Subtitle D Landfill	16.0	ton	$ 32.00	$ 42.20	$ 675
15	Oversight Labor	100	hr	$ 89.19	$ 117.61	$ 11,761
16	Drilling Crew Per Diem, Assume 2 Persons	10	day	$ 365.90	$ 482.49	$ 4,825
	Quarterly Sampling, First 2 Years (8 Events)					**$ 219,169**
17	Groundwater Compliance	176	each	$ 65.67	$ 86.60	$ 15,241
18	Labor	720	hr	$ 119.53	$ 157.62	$ 113,485
19	Equipment - Meters	1.0	ls	$ 13,536.00	$ 17,849.17	$ 17,849
20	Consumables	1.0	ls	$ 5,324.00	$ 7,020.46	$ 7,020
21	Data Validation	160.0	hr	$ 103.60	$ 136.61	$ 21,858
22	Reporting	320.0	hr	$ 103.60	$ 136.61	$ 43,716
	Institutional Controls					**$ 15,646**
23	Implement Groundwater Use Restrictions	1.0	ls	$ 11,865.00	$ 15,645.71	$ 15,646

Construction Subtotal		**$ 392,569**
Contingency (15%)		$ 58,885
Construction Total		**$ 451,454**
Prime Contractor Markup (8%)	lump sum	$ 36,116
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 9,029
Engineering design (6%)	lump sum	$ 27,087
Project Management and Field Oversight (25%)	lump sum	$ 112,864
Total Estimated Capital Cost (FY 2022 Dollars)		**$ 636,551**

Table 12.9
Groundwater Cost Estimate
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

Groundwater Interim Remedy						
Operation and Maintenance Costs						
Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Annual Sampling and Analysis Subtotal					**$ 104,864**
	Semi-annual Sampling (Years 3-30)					**$ 27,396**
1	Groundwater Compliance Samples	22.0	ea	$ 65.67	$ 86.60	$ 1,905
2	Labor	90.0	hr	$ 119.53	$ 157.62	$ 14,186
3	Equipment - Meters	1.0	ls	$ 1,692.00	$ 2,231.15	$ 2,231
4	Consumables	1.0	ls	$ 665.50	$ 877.56	$ 878
5	Data Validation	20.0	hr	$ 103.60	$ 136.61	$ 2,732
6	Reporting	40.0	hr	$ 103.60	$ 136.61	$ 5,464
	Trend Analysis					**$ 77,468**
7	Data Evaluation	1.0	ls	$ 29,374.00	$ 38,733.85	$ 38,734
8	Submittals	1.0	ls	$ 29,374.00	$ 38,733.85	$ 38,734

O&M Annual Subtotal		**$ 104,864**
Contingency (15%)		$ 15,730
O&M Annual Total		**$ 120,594**
Prime Contractor Markup (8%)	lump sum	$ 9,647
Payment/Performance Bonds and Insurance (2%)	lump sum	$ 2,412
Engineering design (6%)	lump sum	$ 7,236
Project Management and Field Oversight (25%)	lump sum	$ 30,148
Total Estimated Annual O&M Cost (FY 2022 Dollars)		**$ 170,037**

Item	**Description**	**Quantity**	**Unit**	**Unit Price**	**Unit Price (Incl. Inflation)**	**Total Cost**
	Periodic Costs (Years 5, 10, 15, 20, 25, 30)					**$ 73,843**
	Five Year Review Report	1.0	ls	$ 16,000.00	$ 21,098.31	$ 21,098
	Update Institutional Controls Plan	1.0	ls	$ 20,000.00	$ 26,372.88	$ 26,373
	Monitoring well inspections/repairs	1.0	ls	$ 10,000.00	$ 13,186.44	$ 13,186
	Well repairs and maintenance	1.0	ls	$ 10,000.00	$ 13,186.44	$ 13,186

Groundwater Interim Remedy						
Present Value Analysis						
Item	**Description**			**Total Cost Per Year**	**Total Cost**	**Present Value**
	Total Estimated PV of Alternative O&M (FY 2022 Dollars)					**$ 2,503,150**
	Annual O&M Costs (Years 3 through 30)			$ 170,036.98	$ 4,761,035.33	$ 2,297,717
	Periodic Costs (Years 5, 10, 15, 20, 25, 30)			$ 73,843.00	$ 443,058.00	$ 205,433

Groundwater Interim Remedy		
Cost Summary		
Source	**Description**	**Total**
Table C-41	Design and Construction	$ 636,551
Table C-43	Operation and Maintenance	$ 2,503,150
	Total Estimated Alternative Cost (FY 2022 Dollars)	**$ 3,139,701**

Notes:

Unit prices from FS cost estimate are adjusted for inflation from FY 2017 to FY 2023 using an average inflation rate of 4.72%

cy	Cubic yard
FY	fiscal year
gal	Gallon
hr	Hour
lf	Linear feet
ls	Lump sum
mo	Month
sf	Square feet
sy	Square yards
wk	Week

Table 12.10
Cost Estimate Summary
Amcast Industrial Superfund Site
Cedarburg, Wisconsin

AMCAST INDUSTRIAL SITE				
COST SUMMARY				
Location	**Description**	**Capital Cost**	**Operation & Maintenance**	**Total**
Amcast North	Concrete Sampling and Pressure Washing/Removal, Excavation, Offsite Disposal, Backfill and Site Restoration	$ 3,080,493	$ -	$ 3,080,493
Residential Yards	Soil Excavation, Offsite Disposal, Backfill and Site Restoration	$ 3,793,290	$ -	$ 3,793,290
Amcast South	Excavation, Offsite Disposal, Backfill and Site Restoration	$ 7,933,312	$ -	$ 7,933,312
Quarry Pond	Sediment Dredging to 1 mg/kg PCBs, Bank Soil Excavation, Offsite Disposal, Residual Management Layer, and Site Restoration	$ 12,140,519	$ -	$ 12,140,519
Wilshire Pond	Sediment and Bank Soil Excavation, Structural Excavation, Offsite Disposal, Backfill, and Site Restoration	$ 2,058,198	$ -	$ 2,058,198
North Storm Sewers	Abandon Amcast North Building Storm Sewers, Remove Non-Building Storm Sewer Piping, Excavation and Backfill, Pressure Wash Non-Building Storm Sewers, Offsite Disposal, and Site Restoration	$ 3,122,871	$ -	$ 3,122,871
South Storm Sewers	Remove Storm Sewer Piping, Excavation, Offsite Disposal, Backfill, and Site Restoration	$ 4,303,213	$ -	$ 4,303,213
Groundwater (Interim)	Institutional Controls and Groundwater Monitoring	$ 636,551	$ 2,503,150	$ 3,139,701
	TOTAL ESTIMATED COST:	$ 37,068,427	$ 2,503,150	$ 39,571,597

ATTACHMENT 3

Administrative Record Index

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR THE
AMCAST INDUSTRIAL CORPORATION
CEDARBURG, OZAUKEE COUNTY, WISCONSIN

UPDATE 1
APRIL19, 2023
SEMS ID: 980406

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	979245	03/26/91	Castner Law Offices Amcast Counsel	WDNR	Report - Re: Amcast Industrial PCB Sampling Data	46
2	323632	03/24/93	Geraghty & Miller, Inc.	WDNR	Report - Re: Amcast Industrial South Disposal Area Investigation	69
3	323643	05/17/94	Geraghty & Miller, Inc.	WDNR	Report - Re: Amcast Industrial Site Assessment	55
4	323642	09/01/01	Sigma Environmental Services, Inc.	Amcast Industrial Corporation	Report - Re: Amcast Industrial Phase I Environmental Site Assessment	50
5	400089	06/06/07	ENSR / AECON	U.S. EPA	Report - Re: Amcast Industrial Site – Phase II Investigation	238
6	919101	09/01/11	CH2M Hill, Inc.	U.S. EPA	Report - Re: Quality Assurance Project Plan for Remedial Investigation/Feasibility Study at the Amcast Industrial Site	334
7	941052	05/01/15	CH2M Hill, Inc.	U.S. EPA	Report - Re: Final Remedial Investigation at the Amcast Industrial Site	1905
8	941051	05/01/17	CH2M Hill, Inc.	U.S. EPA	Report - Re: Remedial Alternatives Evaluation	161

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
9	978408	06/12/20	CH2M Hill, Inc.	U.S. EPA	Report - Re: Final Feasibility Study Report	261
10	980396	03/13/23	Tetra Tech, Inc.	U.S. EPA	Report - Re: Evaluation of Preliminary Remediation Goals and Update to Alternative Cost Estimates (Revision 3)	123
11	981536	04/13/23	Wisconsin DNR	U.S. EPA	Memo - Re: Comments on Proposed Plan	5

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR THE
AMCAST INDUSTRIAL CORPORATION
CEDARBURG , OZAUKEE COUNTY, WISCONSIN

UPDATE 2
SEPTEMBER, 2023
SEMS ID:

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	982023	05/12/23	U.S. EPA	General Public	Report - Regarding: Superfund Program Proposed Plan	94
2	983686	05/31/23	Cream City Reporting	General Public	Public Meeting Transcript May 31. 2023 Re: Am cast Industrial Corporation	85
3	984444	06/12/23	U.S. EPA	General Public	Public Comment Sheets - Re: Am cast Industrial Corporation [Redacted]	21
4	984454	07/25/23	Fusinski, K., U.S. EPA Toxicologist	Sasnow, Z., U.S. EPA	Memo - Re: Risk Evaluation for PCB's at the Former Am cast Site	3
5	985365	09/14/23	Sasnow, Z., U. S. EPA	McKnight, K., WDNR	Letter - Regarding: Response to Comments on the Proposed Plan and Record of Decision (ROD) Drafts	3
6	983602	09/21/23	Sasnow, Z., U. S. EPA	McKnight, K., WDNR	Letter - Regarding: Potential Applicable or Relevant and Appropriate Requirements (ARARs)	3
7	*****	*****	*****	*****	Record of Decision (ROD) *Pending*	*****

ATTACHMENT 4

Wisconsin Department of Natural

Resources Concurrence Letter

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

August 17, 2023

Douglas Ballotti, Director
Superfund Division
USEPA Region 5
77 West Jackson Boulevard
Chicago IL 60604

Subject: Concurrence on the Record of Decision
Amcast Industrial Corporation Superfund Site, OU1

Dear Mr. Ballotti:

The Wisconsin Department of Natural Resources (Department) is providing you with this letter to document the Department's concurrence with the remedy selected for the Amcast Industrial Superfund site (Site). We believe the selected remedy complies with Wisconsin Statute and Administrative Code requirements and is protective of human health and the environment. The remedy, as outlined in the May 2023 Proposed Plan and the September Record of Decision (ROD), is considered the final remedy for the impacted soil, sediment, and sewer lines (OU1) and includes an interim remedy for groundwater (OU2).

The selected remedy includes:

- Amcast North: Sampling of concrete and pressure washing or excavation of contaminated concrete, excavation of contaminated soil, with off-site disposal and backfilling with clean fill;
- Residential Yards: Excavation of contaminated soil, with off-site disposal and backfilling with clean fill and yard restoration;
- Amcast South: Excavation of contaminated soil, with off-site disposal and backfilling with clean fill;
- Quarry Pond: Contaminated sediment dredging, bank soil excavation, with off-site disposal, followed by placement of a residual management layer and site restoration;
- Wilshire Pond: Berm sampling, contaminated sediment dredging and bank soil excavation, with offsite disposal and backfilling of banks and berms as needed with clean fill, followed by site restoration;
- Amcast North Storm Sewers: Pressure washing sewers, removal or abandonment of sections of sewer piping, with off-site disposal and backfill with clean fill;
- Amcast South Storm Sewers: Pressure washing sewers, removal of storm sewer piping, excavation of contaminated backfill, with off-site disposal and backfill with clean fill; and
- Groundwater (interim remedy): Monitoring and institutional controls.

The Department understands that the Site remediation will be financed by the Superfund Trust Fund and that the State of Wisconsin will be required to contribute 10% of the remedial action costs. It is also understood that the State will be responsible for 10% of any operation and maintenance (O&M) costs for the first ten years after the remedial action is complete and 100% of all O&M costs after the first ten years. We understand the selected remedy is designed to minimize long-term O&M costs.

Based on the project remedial action cost of $39,571,384, the State anticipates an approximately $4 million cost share contribution for the remedial action. As mentioned in our comments on the Proposed Plan, the State's

financial participation on this project will require approval of Department management, the Governor's office, and the State Legislature. Legislative action will likely be required to provide the Department with either additional cash or bonding authority. The state has a biennial budget process with the next two-year budget (FY26-FY27) to be final July 1, 2025. If not included in this next two-year budget, the Department would not know if funding is available until July 1, 2027, unless a special appropriation is approved by the legislature's joint finance committee. The Department requests a meeting with the EPA to discuss the timing of the Superfund State Contract and the financial commitment for the remedial action.

Although the proposed cleanup level established for soil complies with Wisconsin Administrative Code (Wis. Admin. Code) ch. NR 720, the DNR does not concur with EPA's decision not to identify Wis. Admin. Code § NR 720.12 as an ARAR for the Amcast site. The DNR continues to maintain that Wis. Admin. Code § NR 720.12 meets applicable criteria to be identified as an ARAR, including Wis. Admin. Code § NR 720.12(1)(a), which provides that Residual Contaminant Levels (RCLs) for the protection of human health from direct contact with contaminated soil must be developed "[f]or individual compounds using an excess cancer risk of 1 x 10-6 and a hazard quotient for non-carcinogens of one." The DNR continues to request that Wis. Admin. Code § NR 720.12 is identified as an ARAR for the site.

At the time of remedy implementation, if the remedy as constructed leaves residual contamination in place above applicable Wis. Admin. Code § NR 720.10 or NR 720.12 cleanup levels, the State may impose continuing obligations consistent with Wisconsin Statute (Wis. Stat.) § 292.12 and Wis. Admin. Code chs. NR 726 and 727. Continuing obligations are intended in part to document areas requiring future soil management under Wis. Admin. Code ch. NR 718 and to limit exposure to remaining environmental contamination at sites. Continuing obligations would apply to current and future owners of property impacted by contamination at the Site, until the conditions for which continuing obligations are imposed no longer exist.

Thank you for your support and cooperation in addressing the contamination at the Amcast Industrial Superfund site. Please feel free to contact me at 608-422-1148 or Judy Fassbender at 414-507-5571 if you have any questions.

Sincerely,

Jenna Soyer, Deputy Director for

Christine Sieger, Director
Remediation and Redevelopment Bureau

CC: Kevin McKnight, WDNR
Zach Sasnow, RPM, EPA Region 5