Jacobs

Final Focused Feasibility Study Report

Kinnickinnic River Project Area, Milwaukee Estuary AOC
Milwaukee, Wisconsin

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Executive Summary

This Focused Feasibility Study (FFS) report develops and presents a recommended remedial alternative for the Kinnickinnic (KK) River Project Area within the Milwaukee Estuary Area of Concern (AOC) in Milwaukee, Wisconsin. The U.S. Environmental Protection Agency (EPA) Great Lakes National Program Office (GLNPO) and project partners (Wisconsin Department of Natural Resources [WDNR], Milwaukee County Parks, City of Milwaukee, Milwaukee Metropolitan Sewerage District, and We Energies) have selected Alternative 3A as the recommended alternative to address contaminated sediment in the KK River Project Area. Alternative 3A addresses sediment with contaminant of concern (COC) concentrations exceeding cleanup goals (CUGs) through dredging, placing a residual sand cover in dredged areas, capping in areas where contaminated sediment cannot be feasibly removed, and capping or placing sand cover over contaminated sediment below an elevation of 552.5 feet North American Vertical Datum of 1988 (NAVD88) in KK River Reaches 1 through 3 and below an elevation of 546.5 feet NAVD88 in KK River Reach 4 and the adjacent Turning Basin. Dredged sediment with polychlorinated biphenyl (PCB) concentrations below the Toxic Substances Control Act (TSCA) threshold of 50 milligrams per kilogram (mg/kg) will be transported to and placed in a dredged material management facility (DMMF) to be constructed in Milwaukee Bay adjacent to the existing confined disposal facility. Dredged sediment with PCB concentrations exceeding the TSCA threshold will be transported to an offsite Subtitle C landfill for disposal. The recommended alternative will achieve the site-specific remedial action objectives (RAOs) by reducing the mass, volume, and concentrations of COCs in sediment, reducing risks to human health and the environment from exposure to COCs in sediment, and maintaining depth and operational requirements within the authorized federal navigation channel (FNC) and Turning Basin. It will also maintain depth requirements for recreational vessels.

The purpose of the FFS process is to develop and evaluate remedial alternatives and support selection of a remedy that is protective of human health and the environment. The remedy will contribute to the eventual removal of beneficial use impairment (BUIs) and delisting of the Milwaukee Estuary AOC.

The FFS includes the following:

- A conceptual site model summarizing physical site characteristics, nature and extent of contamination, historical and ongoing sources of contamination, recontamination potential, and exposure pathways and receptors.
- Site-specific RAOs and development of remediation target areas (RTAs).
- Identification and screening of remedial technologies.
- Description of remedial alternatives.
- Comparative analysis of the alternatives against seven evaluation criteria.
- Identification and rationale for a recommended remedial alternative.

The following site-specific RAOs for the KK River Project Area include remedial goals to improve the portion of the AOC where the project is located, and support removing BUIs and delisting the AOC:

- Reduce the mass, volumes, and concentrations of COCs in the sediment. This will be achieved by addressing sediment with COCs exceeding the CUGs, thereby reducing exposure and risk to ecological and human receptors. The remediation of contaminated sediment in the project area will make progress towards eliminating sediment-related BUIs.

- Reduce risks to human health and the environment from exposure to COCs in sediment. This will largely be accomplished by supporting the removal of BUIs through remediation of sediment with COC concentrations above the CUGs.
- Maintain depth and operational requirements within the authorized FNC and Turning Basin.

RTAs were developed using three different screening level scenarios to provide flexibility in developing remedial alternatives for the KK River Project Area and facilitate sediment disposal planning for the overall Milwaukee Estuary AOC. The three screening level scenarios are based on EPA and project partner agreement as follows:

- Probable Effect Concentrations (PECs) provided in the WDNR's *Wisconsin Consensus-based Sediment Quality Guidelines* (CBSQGs) (WDNR 2003) for polycyclic aromatic hydrocarbons (PAHs) and metals (chromium, lead and mercury) and 1 mg/kg for PCBs
- 3 times the PEC values (PECs) for PAHs and metals and 1 mg/kg for PCBs
- 3 times PECs for PAHs and metals and 3 mg/kg for PCBs

Representative remedial technologies were identified and screened. Remedial technologies that remained following screening were assembled into the five remedial alternatives summarized in Exhibit ES-1. Each conceptual remedial alternative was developed using the same approach, with a common set of technologies. Within the RTAs, sediment that can be feasibly removed will be dredged, and isolation or stabilization technologies will be applied to the sediment with COC concentrations exceeding CUGs that remain in place. Alternative 3A was developed because of concerns about AOC-wide estimated dredge volumes exceeding the DMMF capacity. Alternative 3A has the same RTA as Alternative 3, but reduces dredge volume by establishing a maximum sediment removal elevation. The reduction in dredge volume for Alternative 3A results in an increase in the areas requiring capping or cover.

Exhibit ES-1. Conceptual Remedial Alternatives for the Kinnickinnic River Project Area

Alternative	Alternative Description
1	No Action
2	Remediate sediment with COC concentrations greater than the PECs for total PAHs or metals or greater than 1 mg/kg total PCBs: dredge (estimated total dredgeable volume of 703,500 cubic yards [CY]) and cap sediment that cannot be removed (estimated 31 acres)
3	Remediate sediment with COC concentrations greater than the 3 times PECs for total PAHs or metals or greater than 1 mg/kg total PCBs: dredge (estimated total dredgeable volume of 391,500 CY) and cap sediment that cannot be removed (estimated 19 acres)
3A	Remediate sediment with the same COC concentrations as Alternative 3 above a maximum dredge elevation of 552.5 feet NAVD88 in KK River Reaches 1 through 3 and 546.5 feet NAVD88 in KK River Reach 4 and the adjacent Turning Basin: dredge (estimated total dredgeable volume of 281,000 CY), cap sediment that is not removed in Reaches 1 through 4 (estimated 15 acres) and place sand cover over sediment that is not removed from the Turning Basin (estimated 19 acres)
4	Remediate sediment with COC concentrations greater than the 3 times PECs for total PAHs or metals or greater than 3 mg/kg total PCBs: dredge (estimated total dredgeable volume of 357,500 CY) and cap sediment that cannot be removed (estimated 18 acres)

Each remedial alternative, except for Alternative 1 (No Action), meets the threshold criterion (compliance with environmental laws and standards). Alternative 2 has the greatest long-term effectiveness because it is based on the most conservative (lowest) set of CUGs, and results in the greatest reduction of mass,

volume, and concentration of COCs in sediment. Alternatives 3, 4, and 3A have progressively lower reductions in COC mass and volume. Alternatives 3A and 4 have the greatest short-term effectiveness because the remedies would be completed in the shortest time periods (5 months); Alternative 4 would impact the smallest area. Alternative 3A is the most implementable from a technical standpoint because it has the lowest removal volume and meets the DMMF capacity on an AOC-wide basis, whereas Alternatives 2, 3, and 4 do not. The other construction, implementation, and administrative challenges are similar for Alternatives 2, 3, 3A, and 4. The restoration time frames are 5 months (Alternatives 4 and 3A), 6 months (Alternative 3) and 9 months (Alternative 2). Alternative 3A has the lowest estimated cost ($88.2 million [M]). Alternatives 4, 3, and 2 are progressively more costly ($93.6M, $99.1M, and $142.1M, respectively).

Alternative 3A was selected as the recommended alternative based on evaluation of dredged material volume estimates for disposal in the DMMF and consideration of project costs on an AOC-wide basis. Alternative 3A provides a similar level of protectiveness to Alternative 3 and reduces dredge volume by establishing a maximum sediment removal elevation throughout the KK River Project Area. The recommended alternative will be further refined during remedial design.

The recommended alternative will be the further refined during remedial design. The recommended alternative was the subject of public outreach efforts. This Final FFS Report was prepared in consideration of public comments received.

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Acronyms and Abbreviations

Acronyms	Definition
µg/L	microgram(s) per liter
§	Section
3D	three-dimensional
AOC	area of concern
BRRTS	Bureau for Remediation and Redevelopment Tracking System
BUI	beneficial use impairment
CAD	AutoCAD computer software
CBSQG	Consensus-Based Sediment Quality Guideline
the City	City of Milwaukee
COC	contaminant of concern
Cr	chromium
CSM	conceptual site model
CSO	combined sewer overflow
CUG	cleanup goal
CY	cubic yard(s)
DMMF	dredged materials management facility
EPA	U.S. Environmental Protection Agency
ERP	environmental remediation project
EVS	Earth Volumetric Studio
FFS	focused feasibility study
FNC	federal navigation channel
FS	feasibility study

Acronyms	Definition
ft^3/s	cubic feet per second
GIS	geographic information system
GLLA	Great Lakes Legacy Act
GLNPO	Great Lakes National Program Office
GLWQA	Great Lakes Water Quality Agreement
Hg	mercury
IGLD	International Great Lakes Datum
ISS	in situ stabilization
KK	Kinnickinnic
LUST	leaking underground storage tank
LWD	low water datum
M	million
mg/kg	milligram(s) per kilogram
MMSD	Milwaukee Metropolitan Sewerage District
NAVD88	North American Vertical Datum of 1988
OHWM	ordinary high water mark
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
PEC	probable effect concentration
RAETM	Remedial Alternatives Evaluation Technical Memorandum
RAO	remedial action objective
RAOR	Remedial Action Option Report
RAP	remedial action plan

Acronyms	Definition
RTA	remediation target area
SMC	South Menomonee Canal
SSP	steel sheet pile
SWAC	surface-weighted average concentration
TOC	total organic carbon
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
µg/L	micrograms per liter
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System
WWTP	wastewater treatment plant

1. Introduction

This Focused Feasibility Study (FFS) Report summarizes site conditions, remedial action objectives (RAOs), remediation target areas (RTAs), remedial technology screening, and remedial alternatives development and evaluation, and presents a recommended remedial alternative for the Kinnickinnic (KK) River Project Area within the Milwaukee Estuary Area of Concern (AOC) in Milwaukee, Wisconsin. In accordance with Task Order Number 68HE0520F0069 under Contract Number 68HE0519D00007, Jacobs[1] prepared this FFS with the Great Lakes National Program Office (GLNPO) as part of the Great Lakes Legacy Act (GLLA) work. This evaluation also aligns with the process outlined in Wisconsin Administrative Code Section (§)NR 722.07 for the selection of remedial alternatives. The Milwaukee Estuary AOC includes portions of three watersheds along the Milwaukee River, Menomonee River, and KK River, as well as the inner and outer Milwaukee Harbor ("Milwaukee Bay"), two former industrial canals, and the nearshore areas of Lake Michigan (Figure 1-1).

The KK River is approximately 9.6 river miles long from its headwaters to the confluence with the Milwaukee River (Anchor QEA 2021b). The KK River Project Area for the Milwaukee Estuary AOC begins downstream of the Interstate 43 overpass at the S. Chase Avenue Bridge and extends 2.5 miles downstream to the confluence with the Milwaukee River (Figure 1-2).

This document consists of the following sections:

- Section 1 provides an introduction and summarizes the regional setting within the Milwaukee Estuary AOC, project background and beneficial use impairments (BUIs), general site and background information for the KK River Project Area, and the most recent site investigations and their associated reports.
- Section 2 presents the conceptual site model (CSM) for the KK River Project Area, including descriptions of physical site conditions, the nature and extent of contamination, historical and ongoing sources of contamination, recontamination potential, and potential exposure pathways and receptors.
- Section 3 provides an overview of how RAOs are developed for remedial actions to be conducted in the Milwaukee Estuary AOC for GLNPO in partnership with non-federal sponsors as part of the GLLA work. Site-specific RAOs, threshold screening levels, and development of RTAs for the KK River Project Area are also presented.
- Section 4 summarizes the results of the remedial technology screening for the KK River Project Area to focus remedial alternatives development on only those technologies most applicable to the site and presents the conceptual remedial alternatives that are further developed in Section 5.
- Section 5 describes five remedial alternatives for the KK River Project Area, including the No Action alternative.
- Section 6 presents the detailed analysis of alternatives. The evaluation criteria are described first, followed by an analysis of the individual alternatives relative to the evaluation criteria and comparative analysis between alternatives.
- Section 7 presents the Recommended Alternative, as discussed with project partners.
- Section 8 presents the reference documents cited in this FFS Report.

[1] On December 15, 2017, CH2M HILL Companies Ltd. and its subsidiaries including CH2M HILL, Inc. became part of Jacobs.

1.1 Purpose

The purpose of the FFS process is to develop and evaluate remedial alternatives and support selection of a remedy that is protective of human health and the aquatic environment. The remedy will contribute to the eventual removal of BUIs and delisting of the Milwaukee Estuary AOC.

The FFS task constitutes the third of three tasks completed for the KK River Project Area. The first task established RAOs and general response actions, identified and screened remedial technologies, and presented the conceptual remedial alternatives. The second task was the remedial alternatives evaluation in which the remedial alternatives were further developed to support cost estimates and alternatives were analyzed individually and against each other. Results were documented in the *Remedial Alternatives Evaluation Technical Memorandum* (RAETM) *for the Kinnickinnic River Project Area* (Jacobs 2023b).

The third task consists of completing this Final FFS Report which includes the recommended remedial alternative. A Draft Final FFS Report was completed in September 2023 (Jacobs 2023c). This Final FFS Report incorporates information relevant to four public information meetings that were held after completion of the Draft Final FFS Report review comments received relevant to the Draft Final FFS Report, and changes relevant to compliance with Section 508 of the 1973 Rehabilitation Act (29 United States Code [U.S.C.] 794d).

The FFS for the KK River Project Area was developed during the same timeframe as FFSs for other project areas within the Milwaukee Estuary AOC, including the Milwaukee River Floodplains Reach, the Milwaukee River Downtown Reach, the South Menomonee Canal (SMC), and the Milwaukee Bay. The remediation strategies and approaches for all project areas are being coordinated to the degree possible to achieve overall program objectives.

1.2 Milwaukee Estuary Area of Concern Background

The Milwaukee Estuary was identified as an AOC in 1987, by the International Joint Commission constituted to manage lakes and river systems along the border between Canada and the United States under the Great Lakes Water Quality Agreement (GLWQA) signed by both countries in 1972. The Milwaukee Estuary AOC has a long history of ecological degradation and pollution. Under the GLWQA, the first Milwaukee Estuary Remedial Action Plan (RAP) was completed in 1991 (WDNR1991). Historical discharges from point and non-point sources near to and/or upstream of the AOC resulted in sediment in the AOC waterways being contaminated with various pollutants, including metals, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). The RAP is updated periodically, most recently in June 2022 (WDNR 2022b).

The following 11 BUIs are assigned for the Milwaukee Estuary AOC with 7 (indicated by ***bold italics*** and an asterisk [*]) of the BUIs specific to contaminated sediment:

- ***Restrictions on fish and wildlife consumption****
- Eutrophication or undesirable algae
- ***Degradation of fish and wildlife populations****
- Beach closings (recreational restrictions)
- ***Fish tumors or other deformities****
- ***Bird or animal deformities or reproduction problems****
- ***Degradation of benthos****

- Degradation of phytoplankton and zooplankton populations
- ***Restriction on dredging activities****
- ***Loss of fish and wildlife habitat****
- Degradation of aesthetics (U.S. Environmental Protection Agency [EPA] approved removal of this BUI as of September 8, 2021)[2]

Impacted sediment can be toxic to bottom-dwelling benthic organisms as they feed. Fish, piscivorous birds and mammals, and humans may be exposed to bioaccumulative chemicals, such as mercury and PCBs, via diet. Impacted sediment also has the potential to be resuspended and transported downstream by high flow conditions, seiche effects, and vessels.

1.3 KK River Project Area Features, Reaches, and Background

The KK River flows primarily to the northeast through land owned by Milwaukee County Parks, Milwaukee Metropolitan Sewerage District (MMSD), and City of Milwaukee (the City) from 60th Street to the Lincoln Avenue Bridge (Figure 1-2). Downstream of Lincoln Avenue, the river passes through a mix of mostly commercial and industrial parcels (Figure 1-2).

The KK River is the most urbanized watershed in the state of Wisconsin (Kort and Taylor 2017). About 30 percent of the streams within the KK River watershed are concrete lined, 30 percent are in an enclosed channel, and most of the remaining streams are in an unstable and open stream channel that is eroding (WDNR 2021). The upper nonchannelized sections of the KK River are severely incised (downcut or eroded streambed) and laterally unstable, with 4 to 5 feet of incision occurring between the 1970s and 2012 (WDNR 2021). The causes of the instability include elements such as urban development with impervious areas, encroachment of impervious areas near to the stream, smaller or nonexistent riparian buffers, and stormwater management systems designed to move runoff quickly away from the land surface and into the stream. The KK River water has a variety of pollutants, including PCBs, E. coli, phosphorus, unspecified metals, and fecal coliform from a mixture of agricultural runoff and storm sewer system discharges (WDNR 2021).

In 2016, the Southeastern Wisconsin Regional Planning Commission developed a draft floodplain update for the KK River watershed that indicated flood flow increases of between 20 percent and 50 percent over what was reported in 2005 (Anchor QEA 2021b). A *Kinnickinnic River Watershed Flood Management Plan* (GRAEF et al. 2017) was then produced that included a flood risk analysis. The Plan developed four alternatives to meet the overall project goals for the KK watershed: reduce flood risk to all structures subject to flooding in the 1 percent annual probability event, improve public safety by reducing the risk of drowning, provide in-stream aquatic habitat, and improve natural aesthetics of the channel. The alternatives provided in the Plan each included components of concrete channel removal, stream naturalization, and green infrastructure.

Reaches for the KK River Project Area established during remedial investigation are shown on Figure 1-2 (Reaches 1 through 4; Anchor QEA 2021b); the KK River Turning Basin adjacent to Reach 4 is also shown.

[2] A letter addressed to Wisconsin Department of Natural Resources (WDNR) from GLNPO dated September 8, 2021, approved WDNR's request to remove the *Degradation of Aesthetics* BUI for the Milwaukee Estuary AOC (EPA 2021). Although various factors historically combined to limit recreational use and diminish the scenic value of the waters within the AOC boundaries (visible debris, trash, floating oil and grease, concrete-lined reaches, and overdevelopment on shorelines), many federal and state water quality regulations, local initiatives, and volunteer programs were implemented to reduce pollution and improve water quality throughout the AOC.

The federal navigation channel (FNC) in the KK River is authorized to -21 feet low water datum (LWD)[3] (557 feet North American Vertical Datum of 1988 [NAVD88]) in Reach 3 and -27 feet LWD (551 NAVD88) in Reach 4. The -27 feet LWD portion of the FNC extends to the confluence with Milwaukee River.

As indicated on Figure 1-2, KK River Reach 1 is the furthest upstream reach, beginning downstream of the S. Chase Avenue Bridge and extending to the W. Becher Street Bridge. Reach 1 has the shallowest sediment bed elevations of the four reaches (Anchor QEA 2021b) and is not authorized as part of the FNC. Reach 1 river sediment is generally coarser than that in the downstream reaches. The Reach 1 shoreline has mostly natural earthen banks with mature trees (87 percent of the shoreline) except for riprap and concrete abutments near S. Chase Avenue and approximately 400 lineal feet of timber piles just south of Lincoln Avenue (Figure 1-3A) (Jacobs 2022a; Dow, pers. comm. 2023). A habitat and aeration feasibility study (FS) was completed in 2017 as part of the KK River Habitat Rehabilitation, to evaluate alternatives for improving fish habitat, water quality, and reducing flood impacts (Montgomery 2017). The findings of this evaluation are further discussed in Section 2.3.2. A proposed trash wheel and riverwalk project is planned by Harbor District, Inc. for the portion of Reach 1 that is just upstream of the W. Becher Street Bridge on the western shoreline (HDI, pers. comm. 2022). Considerations of how remedial alternatives will impact timing, location, access, and trash wheel piling depth and in-place booms will require coordination and evaluation during remedial design.

KK River Reach 2 starts at the W. Becher Street Bridge and extends downstream to the S. Kinnickinnic Avenue Bridge (Figure 1-2) with a shoreline consisting mostly of steel sheet pile (SSP) walls (87 percent of the shoreline) with some docks, piers, and slips (Figure 1-3B) (Jacobs 2022a). Land use is a mixture of industrial and commercial. Historical maps show the KK River Reach 2 with its characteristic 90-degree turn since at least 1915. Reach 2 vessel traffic is mostly recreational because of relatively shallow water depths and low bridge clearances. Reach 2 is not part of the authorized FNC. An estimated 170,000 cubic yards of sediment containing approximately 1,200 pounds of PCBs and 13,000 pounds of PAHs were dredged from Reach 2 in 2009, as part of a GLLA-funded remediation project (CH2M 2011). The response action included installation of new SSP bulkheads and placement of a sand cover of variable thickness. The U.S. Army Corps of Engineers (USACE) performed post-remediation sampling in 2015 (URS/Baird 2016); the results indicated that approximately 30,000 cubic yards (CY) of sediment had accumulated in Reach 2 (WDNR 2022b).

KK River Reach 3 extends from the S. Kinnickinnic Avenue Bridge to the upstream end of the Turning Basin (Figure 1-2) and includes the beginning of the FNC (authorized elevation of -21 feet LWD [557 feet NAVD88]). Reach 3 includes several channel modifications such as the Grand Trunk Slip (formerly known as the Skipper Bud's Slip), the Car Ferry Slip, and the Municipal Slip (Figure 1-2), features evident in this area since the early 1900s (Anchor QEA 2021b). The Reach 3 shoreline has been characterized as having "natural" segments (41 percent of the shoreline) with or without riprap, and concrete (28 percent) or SSP (11 percent) segments (Figures 1-3B and 1-3C) (Jacobs 2022a). The Solvay Coke Superfund site (Solvay site) is located adjacent to Reaches 3 and 4. The Grand Trunk Slip is adjacent to the City-owned parcel currently containing the approximate 7-acre Grand Trunk-Bay View Wetland (Grand Trunk Wetland). The Grand Trunk Wetland project is a management project for the loss of fish and wildlife habitat BUI and a remedial design has been completed for the restoration of the wetland as part of several phases of construction. Construction activities include creation of channelized flow between the Grand Trunk Slip and an enhanced wetlands area in the portion east of the channel (Sigma 2021) (additional design details are provided in Section 2.3.3). Grand Trunk Wetland remedial design plans and specifications will be incorporated and finalized as part of MKE Estuary AOC remedial design activities.

[3] The LWD for Lake Michigan is established at an elevation of 577.5 feet International Great Lakes Datum (IGLD) or 578 feet NAVD88 (USACE 1992). NAVD88 is used as the vertical datum for all the Milwaukee Estuary AOC project areas (including the KK River Project Area). The elevation data reported relative to IGLD 1985 have been converted as follows: NAVD88 = 0.5 feet + IGLD 1985.

Recreational and large commercial vessel traffic occurs within KK River Reach 3 at St. Mary's Cement terminal with frequent loading and offloading of open lake barge vessels; side thrusters used during vessel berthing at St. Mary's Cement can produce sediment resuspension and transport in the area (Anchor QEA 2021b).

As depicted on Figure 1-2, KK River Reach 4 extends beyond Reach 3, past the Turning Basin and downstream to the confluence with the Milwaukee River. The historical shoreline alignment of Reach 4 (and the adjacent Turning Basin) dates to the early 1900s, generally consistent with the current configuration (Anchor QEA 2021b). Reach 4 includes the Greenfield and Washington Slips (Figure 1-2). The Greenfield Slip is used by the University of Wisconsin-Milwaukee School Freshwater Sciences and is used for overwintering and mooring of EPA's Research Vessel, *The Lake Guardian*. The Washington Slip is located south of the Greenfield Slip (Figure 1-2).

KK River Reach 4 includes the FNC maintained at -27 feet LWD (551 feet NAVD88); the Turning Basin is not part of the FNC, but requirements for vessel clearance in the Turning Basin are similar to those for the FNC (Port of Milwaukee, pers. comm. 2023); remedial actions for the Turning Basin will be planned assuming identical conditions to the adjacent FNC. Small watercraft and large vessel traffic occur in Reach 4 and the Turning Basin. Approximately 81 percent of the Reach 4 shoreline consists of SSP and 10 percent of concrete, with the remaining consisting of natural shoreline (Figures 1-3C, 1-3D, 1-3E) (Jacobs 2022a). SSP accounts for approximately 74 percent of shoreline type in the Turning Basin (Figures 1-3C and 1-3D) (Jacobs 2022a)[4].

There are several proposed improvement projects associated with KK River Reach 4 planned by private and public entities in Milwaukee including a riverwalk feature designed to extend from S. Kinnickinnic Avenue to E. Greenfield Avenue (4,300 feet) and a "Node" feature along the shoreline of the new Komatsu property that allows public access to the water and creates aquatic habitat and spawning zones (Jannene 2021). Various conceptual, multi-use features and improvements for the area at the east end of Greenfield Avenue, adjacent to the Greenfield Slip (Figures 1-2 and 1-3D) are proposed in the *Harbor District Water and Land Use Plan* (HDI 2017). Considerations of how remedial action for sediment will impact timing, location, and access in the KK River Reach 4 area during various planned activities will require coordination and evaluation during remedial design.

1.4 Recent Site Investigations, Sediment Removal, and Documentation

This section identifies the relatively recent investigations within the KK River Project Area that are relevant to the FFS. As noted in Section 1.3, a remedial action was completed within a portion of the KK River (Reach 2) in 2009. Data from the following investigations were used to delineate the nature and extent of contamination in the KK River (summarized in Section 2.4):

- 2015 KK River Turning Basin Site Characterization performed by EPA GLNPO (CH2M 2016)
- 2016 Solvay Coke Superfund Investigation by We Energies (Arcadis 2016)
- 2020 KK River and Outer Harbor/Nearshore Area Sediment Investigation by WDNR (Anchor QEA 2021b)
- 2020 KK River Channel Navigation Channel Sediment Investigation by USACE (Advanced Matrix-AEM Group JV, LLC 2021)

[4] Approximately 22 percent of the KK River Turning Basin and 5 percent of the remaining shoreline in Reach 4 could not be assigned a bulkhead type and structural condition level because of the presence of a docked barge and/or support vessel obstructing inspection of the shoreline. These sections are presented as features with "No Data" and/or "Unassigned" structural condition level.

- 2021 KK River and Milwaukee Bay Data Gap Sediment Investigation by WDNR (Anchor QEA 2021c)
- 2022 FFS Predesign Investigation performed by EPA GLNPO (Jacobs 2023a)

In 2018, AECOM performed sampling for the City of Milwaukee at three locations in the Grand Trunk Slip and identified Toxic Substances Control Act (TSCA)-regulated sediment in that area (AECOM 2018). Subsequent investigations have been performed to further delineate the TSCA-regulated material in this area.

Investigations completed before those previously listed and their conclusions regarding historical operations and potential effects on the KK River contaminant of concern (COC) concentrations are discussed in previous documents, most comprehensively in the *100% Site Investigation Report, Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern* (Anchor QEA 2021b).

The data set associated with the remedial investigation performed for the Solvay site was reviewed during incorporation into the AOC-wide database; several limitations related to data usability were identified. The data collected in 2001, 2003, and 2006 did not report sediment elevations, so these data points were excluded from the FFS. In the remaining data sets collected in 2009, 2012, and 2013, the number of PAH compounds reported in the data sets varied and in some instances several PAHs [chrysene or dibenz(a,h)anthracene] were not reported, resulting in a low bias for total PAH results (estimated to be between 1 and 8 percent low bias). PCBs were not included in the 2013 data set and discrepancies between reported individual Aroclor results and total PCBs in the 2009 and 2012 data sets were identified and not able to be resolved. These observations were shared with EPA and WDNR during a status meeting on April 18, 2022, where the following path forward was agreed to: PAH and metals data, where available from the 2009, 2012, and 2013 Solvay site data sets, were incorporated for the purposes of the FFS; the PCB data from these same data sets and years were not incorporated. Samples collected in 2009 from Reach 2 and immediately upstream were not included in the FFS (sample locations KK-SDU01 through KK-SDU10) because Reach 2 was remediated after these samples were collected. Surface samples collected in 2009 along the shoreline near historical pipe outfalls were also excluded (sample locations P-1 through P-8); surface sediment samples collected during the same investigation for a sediment triad study (KK-SDA01 through KK-SDA10) were also excluded.

The 2015 investigation provided preliminary information regarding COCs in the KK River Turning Basin. Results indicated moderate to significant PCB, PAH, and metals concentrations, and recommended additional investigation and development of remedial alternatives for this area (CH2M 2016).

USACE performed sediment sampling within the FNC in 2020, to determine the status of sediment contamination to a maximum depth of 17 feet below sediment surface. The data were collected to categorize the sediment, evaluate disposal options, and obtain data for future project planning and designs (Advanced Matrix-AEM Group, JV, LLC 2021). Sediment cores were collected in September and October 2020 at 52 locations within the FNC. Samples were collected from the 0 to 1 foot depth interval, followed by 2-foot depth intervals to the end of each boring. Samples were analyzed for PCBs, PAHs, metals, and total organic carbon (TOC). A subset of samples was analyzed for total phosphorus, percent solids, percent moisture, in-place density, specific gravity, grain size, and Atterberg limits.

WDNR performed field investigations in 2020, to characterize the nature, degree, and extent of contaminated sediment in the KK River Project Area (Anchor QEA 2021b). In addition, the investigations included an aerial drone survey to assess site conditions, a bathymetric survey to measure sediment bed elevations, and side-scan sonar and mobile LiDAR surveys to characterize shoreline features. Geotechnical field and laboratory testing were conducted to measure sediment strength and characterize geotechnical

engineering properties. Sediment samples were analyzed for PCB Aroclors, PAHs, metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc), and total solids. Select samples were analyzed for oil and grease, TOC, grain size, specific gravity, Atterberg limits, and moisture content. The most recent bathymetric survey data used in the FFS were obtained in fall 2020 (Seaworks 2020). Video footage was collected from both upstream and downstream views and is available in the project record (Anchor QEA 2021b).

The primary objective of WDNR's 2021 investigations in the KK River Project Area was to refine nature, degree, and extent of PCB and PAH contamination in sediment (Anchor QEA 2021a). In addition, WDNR's 2021 KK River sediment sampling targeted areas upstream of Reach 1 (upstream of S. Chase Avenue Bridge to the channel discharge into the KK River at 60th Street and W. Kinnickinnic River Parkway), and from Reaches 1 and 2, to provide information regarding potential contamination sources, eventually also addressing potential recontamination to the KK River from those potential sources (WDNR 2022b). Samples were collected from small pockets of sediment in the concrete-lined portions of the channel (and its tributaries), from natural stream bank deposits located at elevations lower than the field-observed Ordinary High Water Mark (OHWM), from restored riprap channels, and from sediment near stormwater outfalls (WDNR 2022b). In addition, sediment samples were collected from manholes upstream of storm sewer and combined sewer overflow (CSO) outfalls to evaluate if stormwater runoff contributes contamination to the KK River (Anchor QEA 2021c). Additional 2021 sample locations included those along banks and/or at locations specifically offset from 2020 locations. The 2021 sediment samples were analyzed for PCB Aroclors, PAHs, metals (arsenic, cadmium, chromium, mercury, lead, nickel, zinc), TOC, and moisture content. Select samples were analyzed for PCB congeners, grain size, specific gravity, and Atterberg limits (Anchor QEA 2021c).

Jacobs conducted a shoreline survey of the KK River Project Area in October 2021, documenting the visible portions of structures above the water line for shoreline construction type (Figures 1-3A through 1-3E) and structural condition (Jacobs 2022a). The structural condition evaluation did not provide a quantitative assessment of structural stability, particularly with respect to potential removal of sediment at the foot of constructed walls. The general criteria used to classify conditions were as follows:

- Excellent – No significant defects – slight imperfections may exist
- Good – Minor deterioration or defects evident
- Fair – Sound structure with clear evidence of deterioration
- Marginal – Moderate deterioration
- Poor – Serious deterioration in some portions of the structure
- Very Poor – Extensive deterioration

GLNPO also performed geotechnical sampling in the KK River during October and November of 2021, as reported in the Final *2021 Geotechnical Sediment Sampling Technical Memorandum* (Jacobs 2022b). Individual sediment samples were analyzed for some combination of the following parameters: moisture content, dry density, organic content, Atterberg limits, grain size, consolidation, unconfined compression, and specific gravity (Jacobs 2022b).

Additional sediment samples were collected from the Grand Trunk Slip during the 2022 GLNPO predesign investigation to further delineate PCB concentrations exceeding the 50 milligrams per kilogram (mg/kg) TSCA threshold. Sediment cores were collected from eight locations to a maximum depth of 20 feet below the sediment surface, resulting in a total of 62 sediment samples (including samples archived for potential future analysis and quality assurance samples). Samples were analyzed for PCB Aroclors, PAHs, and select metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) (Jacobs 2023a).

2. Conceptual Site Model

The CSM summarizes the physical characteristics of the KK River Project Area, describes the nature and extent of contamination, and identifies potential sources of contamination, migration pathways, and potential receptors. The CSM is visually depicted on Figure 2-1, which shows spatial relationships between potential sources, contaminant transport pathways, receiving waters, and potential receptors.

2.1 Hydrology and Bathymetry

The river hydrology within the larger Milwaukee Estuary AOC Project Area is a complex system influenced by a combination of Lake Michigan water elevations, river flow rates, and volumes. The Milwaukee Estuary also receives water from Lake Michigan during periodic seiche events within the lake. Lake Michigan oscillates between its western and eastern shores as a result of strong winds or atmospheric pressure changes because it is essentially an enclosed system. Because wind and/or atmospheric conditions are almost never static, seiche events are almost always occurring on Lake Michigan. When water is pushed toward the western shore of Lake Michigan, it flows upstream into the KK River.

The KK River watershed is the smallest and the most urban of the Milwaukee River Basin watersheds, draining an area of approximately 25 square miles. In the 1960s, the KK River was channelized with concrete in an attempt to quickly move flood waters from the heavily urbanized watershed to Lake Michigan. With nearly 50 percent of the surfaces within the watershed composed of impervious materials such as streets, parking lots, or rooftops, water flows quickly off of these surfaces during storms, resulting in frequent flooding (WDNR 2012). The watershed contains more than 8 miles of concrete-lined channels and enclosed culverts, which increase the speed and volume of runoff (Kort and Taylor 2017; MMSD 2022). The 2017 *Kinnickinnic River Watershed Flood Management Plan* outlines numerous strategies and projects to restore natural flow conditions to the river by replacing more than seven miles of concrete lining or culverts and expanding river corridors with a natural stream design (GRAEF et al. 2017). MMSD and other community partners have been implementing flood management activities along various river portions in recent years.

Data from a United States Geological Survey (USGS) staff gauge (USGS 04087159) located near 11th Street (approximately 4,500 feet upstream of Milwaukee Estuary AOC KK River Project Area shown on Figure 1-2) are summarized in Exhibit 2-1.

Exhibit 2-1. Average Monthly Discharge Rates for USGS 04087159 from January 2010 through September 2020

Discharge Rate (ft^3/s)	January	February	March	April	May	June	July	August	September	October	November	December
Overall Monthly Average (2010 to 2020)	13	18	29	43	38	34	28	25	24	25	16	16
Monthly Average Maximum	29	41	45	97	74	69	112	60	59	60	39	32
Monthly Average Minimum	3	2	8	17	16	11	11	6	6	10	4	4

Note: Data available (USGS 2022a) from October 1982 through September 2020; period from January 2010 to September 2020 selected to represent a full 10 years of data.

ft^3/s = cubic feet per second

The highest monthly average flow occurs in April (43 ft^3/s) and the lowest occurs in January (13 ft^3/s). The peak monthly flow occurred in July, with discharge rates approximately four times the monthly average flow rate. A second USGS staff gauge (USGS 04087161) that measures only gauge height and water quality (not discharge) is located in KK River Reach 3 as shown on Figure 1-2.

A third USGS staff gauge (USGS 04087170) is located downstream of the KK River's confluence with the Milwaukee River, where the rivers enter Milwaukee Bay (Figure 1-2). Conditions at this gauge are influenced by discharges from the Menomonee, Milwaukee, and KK Rivers. Exhibit 2-2 summarizes monthly discharges at USGS stream gauge station (USGS 04087170). Monthly average flow rates into Milwaukee Bay range from 471 to 1914 ft^3/s (187,000 to 859,000 gallons per minute). Peak annual flow rates at this gauge are generally observed during the months of March and April, after the spring snowmelt. The annual low flow conditions are observed during the summer months of August and September.

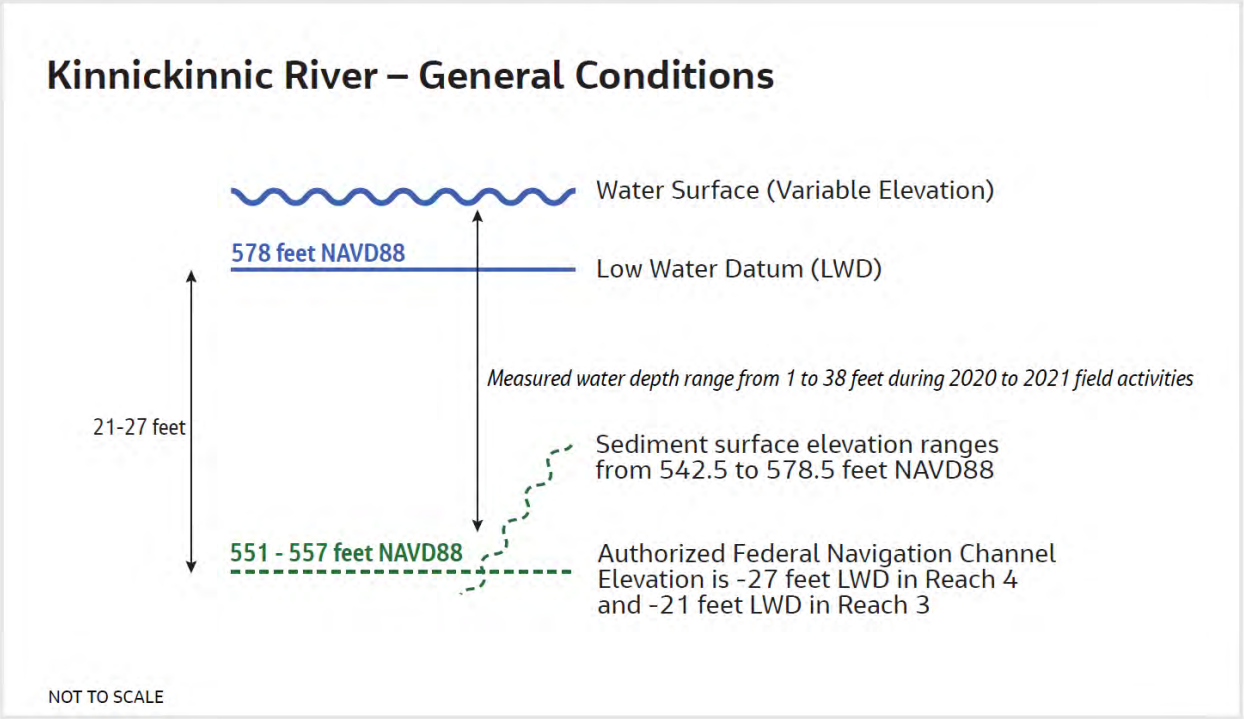
Exhibit 2-2. Average Monthly Discharge Rates for USGS 04087170[a] from January 2010 through August 2020

Discharge Rate (ft^3/s)	January	February	March	April	May	June	July	August	September	October	November	December
Overall Monthly Average (2010 to 2020)	679	746	1554	1914	1372	979	754	528	471	686	658	717
Monthly Average Maximum	1321	1453	2575	3842	2236	1968	2167	1282	1106	2702	1486	1561
Monthly Average Minimum	252	263	560	941	556	185	148	193	101	250	195	304

[a] Data only available through August 2020 (USGS 2022b).

Bathymetric and hydrologic features specific to the KK River Project Area are summarized in Exhibit 2-3.

Exhibit 2-3. Kinnickinnic River Project Area Established Elevations (NAVD88)



Water surface elevations in Reach 3 ranged from 582.1 to 583 feet NAVD88 during Anchor QEA's 2020 investigations (Anchor QEA 2021b) and ranged from and 579.8 to 582 feet NAVD88 during Jacobs' 2021 investigation (Jacobs 2022b). In comparison, water surface elevations at the Milwaukee Bay USGS staff gauge (USGS 04087170) located downstream from KK River Reach 4 ranged from 579.7 to 582 feet NAVD88 during Jacobs' 2021 investigations, indicating that the water surface elevations do not vary significantly across this project area. However, seiche effects resulting in up to 1.7 feet of water surface elevation change across at least one 24-hour period (October 25, 2021) were recorded using a temporary staff gauge installed for 2021 field investigations. The lowest observed elevation change across a 24-hour period during the 2021 fieldwork was 0.4 feet during a 24-hour period (November 2, 2021).

Riverbed elevations within KK River Reaches 1 through 4 and the Turning Basin range as follows (Figures 1-3A through 1-3E):

- Reach 1: 570.5 to 578.5 feet NAVD88
- Reach 2: 558.5 to 568.5 feet NAVD88
- Reach 3: 552.5 to 577.5 feet NAVD88
- Reach 4: 542.5 to 570.5 feet NAVD88
- Turning Basin: 544.5 to 552.5 feet NAVD88

Field water depth measurements during the 2020 and 2021 field investigations ranged from 1 to 38 feet at sampling locations.

2.2 Sediment Characteristics

The physical characteristics of material sampled in the KK River Project Area in 2020, 2021, and 2022 are summarized herein. In general, the term "native material" is used to represent the relatively firm, relatively compacted glacial material in place before more recent deposition of loose sediment, generally referred

to herein as "soft sediment". The soft sediment was classified as predominantly silt or lean clay (Unified Soil Classification System classifications of ML and/or CL) with some occasional sand (SW, SP, or SM). Soft sediment thickness varied across sampled locations from 0.4 foot to 10 feet.

The uppermost soft sediment encountered in Reach 1 (the most upstream reach for this project area, also the most channelized environment) consists of several feet of sand intermixed with silt and organic material; gravel is frequently present, indicating a higher energy alluvial environment for the more recent deposits. Deeper alluvium is often finer, with increasing clay content. The native material encountered in Reach 1 was typically described on boring logs as stiff clay.

The lower reaches (Reaches 2 through 4) of the KK consist of an increasingly lower energy depositional environment, more open with deeper water. These reaches consist of soft sediment that is predominantly composed of very low density silt and clay with trace fine sand and a relatively high organic content (root fibers, wood pieces, detritus). Deeper soft sediment transitions to denser and lower organic content alluvium with more compacted silt and clay, with trace gravel and small shells or shell fragments present in some areas. Native material that underlies the soft sediment and alluvium in these downstream reaches contains much denser silt and/or clay with low-to-no organic content and trace coarse material.

Traces of organic material and anthropogenic debris such as metal, glass, or plastic were also encountered in all reaches of the KK River Project Area. This material was typically found in the upper 1 to 2 feet of sediment, but in some cases (particularly in slips) was found deeper, where reworked sediment could be redeposited.

Grand Trunk Slip boring data, specifically, indicate that the upper soft sediment consists of a mixture of reworked silt, sand, and gravel, with a significant amount of organic material (typically encountered in the upper 5 feet). These conditions are indicative of the shallower water and frequent boat traffic in and out of the slip with propeller wash from boats of various sizes and draft depths frequently resuspending and redepositing sediment. Deeper soft sediment (below the uppermost 5 feet) consists of relatively more compacted silt and clay, with thicknesses to native material greater than 20 feet.

The overall amount of data available for the native material layer is relatively low compared to that for soft sediment because it was encountered less frequently: the maximum target depths assigned for sample collection were often too shallow to reach the native material elevation (data collection efforts were typically focused on more shallow material). However, the elevation information for boring locations encountering native material are summarized in Exhibit 2-4 for each KK River Reach and for the Turning Basin.

Exhibit 2-4. Kinnickinnic River Project Area Elevation Summary (NAVD88) for Borings where Native Material was Encountered

Reach or Area: Number of Borings Encountering Native Material		Minimum	Maximum	Average
Reach 1	14	555.1	570.3	561.6
Reach 2	2	556.8	561.0	558.9
Reach 3	11	548.3	565.9	556.9
Reach 4	12	527.1	558.0	549.3
Turning Basin	12	527.8	549.9	545.2
Grand Trunk Slip	1	557.2	557.2	557.2

Note: Information compiled from boring logs from Jacobs 2022b, Jacobs 2023a, and Anchor QEA 2021b and 2021c, CH2M 2016.

2.3 Habitat

This section is based on general information regarding habitat conditions for the KK River between S. Chase Avenue and Lake Michigan as a whole, as well as information that is available for the region upstream of Reach 1. The general information is first presented, followed by subsections with information specific to the upstream region (Section 2.3.1), Reach 1 (Section 2.3.2), and Reach 3 (Section 2.3.3) (habitat information specific to Reach 2, Reach 4, or the KK River Turning Basin was not specifically identified).

The highly urbanized nature of the KK River watershed has negatively affected the in-stream and river corridor habitats (GRAEF 2018). Significant stretches of the river have been channelized with concrete since the 1960s, but those portions of the river are now being re-naturalized to achieve flood risk reduction. A collaborative effort is ongoing in the KK River watershed to ensure a reduction of flood risk and improve riparian corridors and surrounding green space (GRAEF 2018).

The majority of the KK River shoreline is composed of floodplain forest with localized areas of sheet piles and other manmade structures that support minimal vegetation or animal life. Urbanization and channel modifications have altered the flow conditions in the KK River, resulting in low base flows and peak flows in the KK River that have increased by an order of magnitude over presettlement conditions (Montgomery 2017). The KK River watershed generally contains poor diversity and abundance of fish and benthic macroinvertebrates (insects and other organisms that provide food for fish). The aquatic communities that have been surveyed are dominated by pollution-tolerant species. Lake Michigan seiche can affect the entire KK River Project Area (Montgomery 2017).

The riparian plant communities along the KK River, where present, consist of floodplain forest, southern dry-mesic forest, and degraded emergent marsh. The forests are mature, degraded, and of low to moderate quality with invasive species present. Overall, the river corridor:

- Provides bird cover and likely has value as a migratory stopover.
- Contains limited reptile and amphibian habitat and does not seem to provide complete habitat.
- Contains raccoons, coyotes, and bats present (or habitat in which they are likely to occur) along with other small mammals.
- Provides mostly favorable habitat for invertebrates, but invertebrate species diversity and quality are only fair.
- Will likely provide essential refuge and movement corridors for wildlife in an urban setting (Montgomery 2017).

2.3.1 Region Upstream of KK River Reach 1

Qualitative habitat assessment ratings for the in-stream portion upstream of KK River Reach 1 have been assigned a condition of "fairly poor" between S. 6th Street and S. Chase Avenue (Montgomery 2017). The following conditions have been observed:

- Approximately 5 feet of sediment has been deposited upstream of S. Chase Avenue between 1978 and 2014, likely because of the loss of sediment transport capacity as the river flow meets backwater from the lake (HNTB 2014).

- The river portion between 6th Street and S. Chase Avenue provides good habitat for macroinvertebrates. Trichoptera (Caddis flies) and Gammarids (which typically indicate groundwater inflow) were observed there. However, even in this reach, macroinvertebrate diversity is low, and these described upstream conditions do not necessarily transfer downstream to KK River Reach 1 (Montgomery 2017).
- Riverbed materials consist of boulders, cobble, and gravel (Montgomery 2017).

2.3.2 KK River Reach 1

A 2014 KK River Flushing Station Improvements FS (HNTB 2014) noted that this approximate section of the KK River (between Interstate 94 and W. Becher Street) does not sustain viable aquatic habitat because of low dissolved oxygen levels, limited channel morphology diversity, and lack of baseflow. Thereafter, an FS focused on habitat and water quality conditions was completed for this portion of the KK River as part of the KK River Habitat Rehabilitation project (Montgomery 2017). The Montgomery 2017 FS included three final alternatives relevant to habitat and water quality improvement in KK River Reach 1. Each of the FS alternatives include the following elements:

- Riparian corridor woodland habitat enhancement with invasive species removal
- Aquatic habitat improvement via installation of boulders within stream and wood structures along banks (anchored logs and root wads)
- Channel filling and creation of a new, side streambank between S. Chase Avenue and W. Lincoln Avenue to concentrate flow and increase the channel's habitat diversity
- Streambed stone placement along channel bottom between S. 1st Street and W. Becher Street to increase streambed stability and fish spawning habitat and improve habitat for other aquatic organisms
- Limited channel bank improvements
- Increased hydraulic capacity at three road crossings
- Supplemental oxygen provision to the stream using fountains, off-channel cascades, or other measures.

Implementation of the potential in-water channel modifications associated with the KK River restoration in Reach 1 (as previously noted) would be in addition to the remedial alternatives to address the sediment contamination (Section 5). The modifications described in Montgomery (2017) have not been further developed or incorporated into this Draft FFS. The potential for implementing in-water channel modifications will be discussed further during remedial design.

A summary of findings relevant to the KK River Reach 1 habitat conditions is as follows:

- Qualitative habitat assessment ratings were "fair-good" between the S. Chase Avenue and W. Becher Street bridges in Reach 1 (HNTB 2014). Macroinvertebrate Hilsenhoff Biological Index monitoring ratings in Reach 1 were "fairly poor". The assessed area was dominated by sludge worms (Oligocheata) and is more degraded in the downstream direction. An analysis of the fish community produced eight fish species and indicated a "very poor" quality fishery for Reach 1 (HNTB 2014).
- The project area does not generally provide a viable aquatic habitat because of low dissolved oxygen levels, lack of base flow, and limited diversity of the channel morphology (Montgomery 2017).
- The upstream portion of the riverbed in Reach 1, downstream of the flushing station (located just downstream of the S. Chase Avenue Bridge) is generally flat with little bedform diversity. Gravel is

deposited near the flushing station, and the downstream part of Reach 1 is dominated by silt and sand (Montgomery 2017).

- The Reach 1 water levels vary as often as subhourly because of seiche effects; the seiche effects keep organic matter in suspension and elevate dissolved oxygen in the downstream part of Reach 1 (especially downstream of S. 1st Street) (Montgomery 2017).
- The low dissolved oxygen acts as a chemical barrier to fish passage primarily in the first section of Reach 1, between 1st Street and Becher Street, where river velocities are slow and seiche effects are relatively reduced (Montgomery 2017).
- Riverbank armoring is in poor condition. Opportunities occur for natural shoreline restoration to enhance aquatic and riparian habitats as banks are restored over time (Montgomery 2017).
- River substrate materials consist of mainly gravel from the upstream extent at S. Chase Avenue to the middle of Reach 1 at approximately Lincoln Avenue, with silt and finer sediment particles existing farther downstream (Montgomery 2017).
- Reach 1 includes a "loss of fish and wildlife habitat" management action broken into two implementation phases. Phase I management activities completed during 2018 include installation of in-stream boulders and root-wad composites upstream of S. Chase Avenue and upland invasive species work (WDNR 2022b). Phase II management activities in Reach 1 were recommended as part of Montgomery 2017 and will be designed and implemented post-remediation.

2.3.3 KK River Reach 3

KK River Reach 3 contains the Grand Trunk Slip, which is adjacent to the City-owned parcel currently containing the approximate 7-acre Grand Trunk Wetland, where several phases of construction are planned for creation of channelized flow between the Grand Trunk Slip and an enhanced wetlands area (Sigma 2021). Conceptual wetland and habitat restoration alternatives for the slip/channel and the Grand Trunk Wetland parcels include the following features that will influence habitat conditions within and near to KK River Reach 3 (once constructed) (Sigma 2021):

- Excavation of fill material from the upland portion of the property, dredging of the Grand Trunk Slip (as part of the GLLA work) and partial grading of the northern bank of the Grand Trunk Slip.
- A restored stream channel (Grand Trunk Slip) west of S. Marina Drive access road; channel includes a new box culvert providing a hydraulic connection between the channel and the eastern wetland area so that seiche effects will have access to the newly restored wetland.
- Sand dune and meadow habitat restoration north of the seiche wetland.
- Amphibian pond east of the seiche wetland (topographically separated from the seiche wetland so that the two features are not hydraulically connected).
- Meadow, upland prairie, and floodplain forest restoration features south of the seiche wetland.
- Stormwater and sedimentation control features to properly manage newly constructed components.

2.4 Nature and Extent of Contamination

Investigations from 2009 through 2022 within the KK River included characterization of the following COCs: PCBs, PAHs, and select metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc). The total PAH and metals concentrations in sediment were compared to the Probable Effect Concentrations (PECs), which are the recommended thresholds for evaluating sediment COC concentrations as discussed in the WDNR's *Wisconsin Consensus-based Sediment Quality Guidelines*

(CBSQGs) (WDNR 2003). Detected concentrations were also compared to values corresponding to three times and five times 5the PECs to identify more highly impacted locations. PCB concentrations were compared to 1 mg/kg, 3 mg/kg, and 5 mg/kg threshold levels. PCB concentrations were also compared to the 50 mg/kg TSCA threshold. The complete data set is provided in Appendix A, which includes color coding to denote whether results exceed the threshold levels. The comparisons indicate that sediment in the KK River contains elevated concentrations of PCBs[5], metals, and PAHs[6].

Several metals exceed the PEC-based threshold levels, including chromium, mercury, lead, nickel, arsenic, cadmium, copper, and zinc. Chromium, mercury, and lead exhibit the greatest magnitude and frequency of PEC exceedances (Appendix A). The other metals, where detected at concentrations that exceed the PEC, are typically less than the 3 times PEC threshold level. Appendix B provides an analysis confirming that PEC exceedances of other metals in the KK River Project Area are generally co-located with elevated concentrations of chromium, mercury, lead, total PCBs, or total PAHs in the KK River Project Area. Therefore, the FFS uses the exceedance extent of the following constituents as the basis for developing RTAs: total PCBs, total PAHs, chromium, lead, and mercury.

Twenty-one locations were sampled in 2021, between 60th Street and Chase Avenue, upstream of KK River Reach 1 (Anchor QEA 2021c). COC concentrations in most samples upstream of Reach 1 were below the threshold criteria. PAH concentrations in nine samples exceeded the threshold levels: seven exceeded the PEC of 22.8 mg/kg, one exceeded 3 times PEC and one exceeded 5 times PEC. Lead exceeded the PEC in two samples, and PCBs exceeded the 1 mg/kg threshold in one sample. The lead and PCB exceedances were co-located with PAH concentrations above the PEC.

Figures 2-2A through 2-2F were compiled for the purposes of the FFS to summarize the laboratory analytical data used for KK River Reaches 1 through 4 and the Turning Basin. Figure 2-2A identifies surface[7] and subsurface locations with exceedances of the threshold levels for total PAHs, total PCBs, chromium, lead, or mercury. The left panel presents the surface results, and the right panel presents the maximum subsurface result at each location. The surface and subsurface sediment throughout the KK River between Chase Avenue up to and including the Turning Basin is heavily contaminated and COC concentrations at most locations exceed 3 times or 5 times the PEC or the 1 mg/kg threshold level for PCBs. Sediment within the FNC downstream of the Turning Basin is comparatively cleaner.

The distribution of PCBs in surface and subsurface sediment is shown on Figure 2-2B. PCB concentrations in surface sediment are lower than the 1 mg/kg threshold level in most locations. The locations with concentrations exceeding the 1, 3, and 5 mg/kg threshold levels are scattered throughout the project area and are located primarily upstream of the Turning Basin and within the small slips or side channels present (for example, the Washington Slip, Greenfield Slip, Grand Trunk Slip, and the Municipal Slip). One location downstream of the Lincoln Avenue Bridge (Reach 1, KKR-20-008) and two locations in the Grand Trunk Slip have PCB concentrations in the surface sediment that exceed the 50 mg/kg TSCA threshold. In subsurface sediment, PCB concentrations exceeding the 3 and 5 mg/kg threshold levels are present primarily between Lincoln Avenue downstream to and including the Turning Basin, and in the Greenfield and Washington Slips. Subsurface sediment with PCB concentrations exceeding the 50 mg/kg TSCA threshold is present in the Grand Trunk Slip. Of the 27 locations where native material was encountered in

[5] Total PCBs are calculated as the sum of detected Aroclors. Nondetected results are reported as the maximum reporting limit for the individual Aroclors.

[6] Total PAHs are calculated as the sum of 18 PAH compounds. Nondetected results are included in sums as 1/2 of the reporting limit. Where all PAH compounds are nondetected, the sum is reported as the maximum reporting limit for the individual PAHs included in the sum.

[7] The surface interval is the uppermost sampled interval and is 0 to 1 foot in most samples but the bottom depth ranges from 0.1 to 1.3 feet (Appendix A).

the KK River Project Area, the PCB concentration at one location (KKR-20-009 in Reach 1) exceeded the 5 mg/kg PCB threshold (Anchor QEA 2021b).

Figure 2-2C presents the distribution of total PAHs in surface and subsurface sediment. The surface and subsurface sediment total PAH concentrations are above 3 times PEC or 5 times PEC thresholds in most locations in Reaches 1 through 3; downstream of Reach 3, the magnitude and frequency of PAH PEC exceedances decreases, particularly within the FNC. The Greenfield and Washington Slips also contain PEC exceedances in the surface and subsurface zones for PAHs. In samples from the native material, the PAH concentration exceeded the 3 times PEC threshold at one location (KKR-20-009 in Reach 1) (Anchor QEA 2021b).

The surface and subsurface distributions of chromium, lead, and mercury (the maximum observed detected value for the subsurface samples) are presented on Figures 2-2D, 2-2E, and 2-2F, respectively. The surface sediment chromium and mercury concentrations are commonly below the PECs; however, lead concentrations in surface sediment are commonly greater than the PEC in Reaches 1 through 3, the Greenfield and Washington Slips, and the Turning Basin, with exceedances of 3 times PEC or 5 times PEC at several locations.

Subsurface PEC exceedances for chromium and lead (Figures 2-2D and 2-2E) are present throughout the entire KK River, with lower concentrations in the FNC downstream of the Turning Basin compared to the upstream areas. Subsurface mercury concentrations (Figure 2-2F) exhibit a lower frequency and magnitude of exceedance relative to chromium and lead (Figures 2-2D and 2-2E). In the native material, the lead concentration in one sample (KKR-20-009 in Reach 1) exceeded the 3 times PEC threshold and none exceeded the 5 times PEC threshold. Chromium and mercury concentrations in native sediment samples did not exceed the 3 times or 5 times PEC threshold levels (Anchor QEA 2021b).

Figures 2-3 through 2-7 present more detailed surface and subsurface sediment COC profiles relative to the one time, 3 times, and 5 times PEC threshold levels and the 1 mg/kg, 3 mg/kg, and 5 mg/kg threshold levels for PCBs, as well as to the TSCA threshold for PCBs. The COC concentration information and elevation information presented on Figures 2-3 through 2-7 for the samples from the sediment channel and from sediment in various, connected slips, were incorporated into computer modeling that was used to develop RTAs and the associated volumes (see Section 3.2).

Note that several sample designations on Figures 2-3 through 2-7 are located outside of the main KK River channel. Twenty-eight of the 2021 locations were placed within manholes or diversion structures, outside of CSOs, along the banks, or at sediment locations offset from 2020 locations (WDNR 2022b). Bank material was collected in 2021 along Reach 1; resultant concentrations were frequently less than threshold values and also lower than detected concentrations in nearby sediment core samples from either 2020 or 2021 (WDNR 2022b).

2.5 Historical and Potential Ongoing Sources

Potential contaminant sources to the KK River Project Area are presented here as a component of the CSM, with a general depiction of potential source types shown on Figure 2-1. Review of historical data in the WDNR's Bureau for Remediation and Redevelopment Tracking System (BRRTS) revealed more specific potential sources on sites adjacent to the river. In addition, Jacobs reviewed current industrial, stormwater, and construction discharge permits in the public record. Figure 2-8 indicates the locations of potential sources of contamination to the KK River Project Area.

The following subsections note potential sources of contaminants to the KK River using several categories:

- Potential Point Sources
- Potential Non-Point Sources
- WDNR's Remediation and Redevelopment Sites
- Upstream Sites

Additional detail is provided in the *Evaluation of Potential for Recontamination of Sediment Report* (Recontamination Report) (WNDR 2022a), which was prepared by WDNR and the other non-federal sponsors to support the Milwaukee Estuary AOC remediation planning activities.

2.5.1 Potential Point Sources

Both shorelines of the KK River were historically developed to support industrial, commercial, and municipal uses. Many of the facilities that once operated with discharges to the river either ceased operations or were demolished. Few of the facilities remain, and much of the land has been redeveloped for recreational (public parks), industrial, or commercial uses. However, the historical point source discharges (mostly via permitted or nonpermitted industrial sewers) resulted in sediment being contaminated with various pollutants.

Point sources of pollution have discrete discharges, usually from a pipe or outfall. Major reductions in point source activity were accomplished with the advent of the Clean Water Act and the subsequent regulation and permitting of all outfalls. Discharges from pipes or outfalls are regulated under the Wisconsin Pollutant Discharge Elimination System (WPDES) permitting program. As of spring 2021, 17 WPDES permits (all either "stormwater industrial" or "stormwater construction") were active within the KK River Project Area (Table 2-1). Modernized operations, monitoring, and control of discharged water quality reduce the potential contaminant load at currently active industrial and municipal outfalls.

The MMSD holds the WPDES permit for combined sewer discharge to the KK River. In the KK River Project Area, the storm sewer and sanitary sewer systems are commonly combined, with the resultant flow being conveyed in a set of combined sewers to an MMSD wastewater treatment plant (WWTP). However, during periods of heavy rain, the capacity of the WWTP is sometimes exceeded and the CSOs may enter the river, but usually in only very limited locations. CSOs contain common urban pollutants from stormwater runoff as well as from residential, commercial, and industrial users of the WWTP. Figure 2-4 shows the locations of numerous CSO outfalls along the KK River Project Area.

The number and volume of CSOs that negatively impact the water quality in the estuary has decreased significantly with the completion of the "deep tunnel" project in 1994 (MMSD 2022). Between 1994 and 2021, MMSD has captured and treated more than 98.5 percent of the stormwater and wastewater that has entered the regional sewer system totaling over two trillion gallons (MMSD 2022). Over that same period, the annual overflow of untreated stormwater and wastewater released through the CSOs to area waterways during periods of heavy precipitation ranged between 1,500 gallons and 4.4 billion gallons (MMSD 2022). Furthermore, CSO discharges are 90 to 95 percent stormwater and groundwater (MMSD 2022).

2.5.2 Potential Non-Point Sources

WDNR ranks the KK River as a "high priority" for non-point source pollution. Most of the land surface in the river's watershed is urbanized with impervious surfaces and narrow riparian corridors (WDNR 2012). Water flows quickly off these surfaces and fills the KK watershed streams, drastically increasing the risk of flooding. Areas with surface or subsurface soil contamination, or contaminated buildings or infrastructure,

are potential non-point sources of contaminant loads during and after precipitation events until such time that those sites are remediated. Releases to the watershed and sediment environments that are associated with urban runoff may include PCBs, PAHs, or metals. Potential sources of contamination include:

- Construction or environmentally contaminated sites
- Paved or other impermeable surfaces
- Bulk soil or materials storage piles
- Bank soil erosion
- Surface spills
- Atmospheric deposition of airborne contaminants

The MMSD and other governmental and nongovernmental agencies have prioritized some regions of the KK River watershed to address streambank erosion and flooding issues (MMSD 2022). Remediation and/or redevelopment near the KK River Project Area are addressed under applicable stormwater and erosion control requirements. In addition, regional partners are restoring streambed and habitat in accordance with various watershed management plans (GRAEF et al. 2017; GRAEF 2018; Montgomery 2017) to further address urban runoff to the KK River.

A previous study conducted in the Milwaukee area concluded that the primary source of PAHs to sediment in urban area waterways are worn particles of coal-tar-based pavement sealants that are transported by stormwater runoff from parking lots (Baldwin et al. 2016). A recent research study to determine "the distribution and potential health effects of aerially deposited PAHs in soil within the urban core of metropolitan Milwaukee" suggests that aerial deposition is another source of PAHs to urban waterway sediment. The research was conducted at 27 areas in Milwaukee parks that were evaluated as being undisturbed for at least 80 years. The study concluded that "diffuse multiple point source [air] emissions contribute equally to PAH deposition throughout the area" (Siemering and Thiboldeaux 2020). Surface soil (0 to 7 centimeters) sampling locations were chosen specifically to only represent aerial deposition; concentrations of several individual PAHs in the sampled areas exceed their respective WDNR residual contaminant limits per Wisconsin Administrative Code §NR720 for soil cleanup standards. According to the Recontamination Report, the City of Milwaukee banned coal-tar sealants using a substitute ordinance in 2017, at least in part because of the research study (WDNR 2022a).

The potential for unpermitted discharges or spills exists in urban waterways, especially those that are transportation hubs like the KK River Project Area and the associated Turning Basin – receiving waters where significant waste hauling and management activities occur. Potential non-point sources of contamination associated with remediation and/or redevelopment near the KK River Project Area are addressed through applicable stormwater and erosion control requirements.

2.5.3 Wisconsin Department of Natural Resources Remediation and Redevelopment Sites

Jacobs used publicly available data from WDNR to identify several types of historical and current industrial facilities. A review of remediation sites adjacent to the KK River on the WDNR BRRTS sites map (WDNR 2021) and associated data files for the region adjacent to the KK River Project Area identified the presence of multiple historical and current potential sources of metals (for example, arsenic, chromium, lead, and mercury), chlorinated solvents, industrial chemicals (for example, naphthalene, PCBs, per-and polyfluoroalkyl substances, and cyanide), and petroleum compounds (Figure 2-8).

Table 2-2 lists WDNR BRRTS sites near the KK River. The BRRTS sites are classified as either open or closed environmental remediation project (ERP) or closed leaking underground storage tank (LUST) sites adjacent to the KK River. The potential discharge of contaminated groundwater from nearby sites or from

hazardous material spills can represent an additional potential source to the surface water. Impacted media at each of these sites may include soil, groundwater, and/or vapor. WDNR regulates remedial actions and monitoring at ERP and LUST sites. Because of the proximity of the sites to the river, each could have contributed historically to the contamination of the river sediment.

The WDNR Recontamination Report summarizes completed or planned remedial activities for several BRRTs sites adjacent to the KK River (WDNR 2022b). At the former Solvay site (Identification Nos. 49 and 50 on Figure 2-8), extensive remediation activities have already been completed or are planned to reduce the potential for recontamination of the KK River. The Recontamination Report also notes a data gap and source investigation of the S. Marina Drive Storm Sewer site (Figure 2-8, Identification Number 37), adjacent to the Grand Trunk Slip and the Grand Trunk Wetland sites (Figures 1-2 and 2-8). In December 2022, the City submitted to WDNR the *Grand Trunk Wetland Remedial Action Option Report [Revised]* (RAOR), which contained some investigation findings for this area (Sigma 2022). The City intends to remediate the South Marina Drive Storm Sewer; however, additional source control or remediation activities may follow based on investigation findings (WDNR 2022b). The RAOR (Sigma 2022) notes the following:

- Historical operations at 1982 S. Hilbert Street and 427 E. Stewart Street (Nos. 35 and 69 on Figure 2-8, respectively) are potential upstream sources of historical PCB concentrations. The report recommends further investigation at both properties that are currently privately owned and subsequent "implementation of appropriate remedial measures", with investigation and remediation efforts completed at these properties prior to cleanup of the sewer system along S. Marina Drive right-of-way.
- Detected total PCB concentrations in S. Marina Drive storm sewer sediment range from 0.138 mg/kg to 93.2 mg/kg, depending on the manhole or catch basin location from which the sediment was analyzed. The report recommends that PCB-impacted sediment within the S. Marina Drive storm sewer and manholes that are located within the City right-of-way undergo evaluation and cleanup.
- There were no total PCB concentrations detected from S. Marina Drive storm sewer water samples in MH-3 and MH-4. Detected total PCB concentrations in manhole samples MH-1, MH-2, and MH-5 range from 0.072 to 0.35 microgram per liter (µg/L) and all exceed the WDNR's NR 105.07 surface water standard for wildlife (0.00012 µg/L) based on toxicity to wildlife[8]. Detected total PCB concentrations in water collected from manholes and sewers on the 1982 S. Hilbert Street and 427 E. Steward Street properties also exceeded the wildlife criterion with a range of 0.0078 to 0.72 µg/L.
- Storm sewer backfill samples from the S. Marina Drive sewer are minimally impacted with PCB concentrations (ranging from 0.012 mg/kg to 0.027 mg/kg). The report recommends that no additional investigation or remediation is completed for this material.
- Water levels measured within the storm sewer manholes directly correlate with local precipitation data available for nearby Jones Island, and storm sewer water still appears to flow towards the slip during large precipitation events (versus backing up into the sewer from the slip).

2.5.4 Upstream Sites

Pollutants from historical or current agricultural or industrial areas upstream of the KK River Reach 1 may contribute to contaminated sediment in those regions, with the potential for contaminated sediment being washed downstream into Reach 1 (with possible, further downstream movement). However, only a

[8] According to Sigma (2022), the surface water standard used for comparison with detected PCB concentrations was based on toxicity to wildlife because it was suggested by WDNR during a project update meeting with EPA and the City of Milwaukee on June 15, 2022.

few sediment samples collected in the upstream region between 60th Street and Chase Avenue during the 2021 field event had COC concentrations exceeding screening criteria. For example, of 21 samples, only 1 PAH concentration exceeded the 3 times PEC threshold and 1 exceeded the 5 times PEC threshold (see Section 2.4). The WDNR report regarding potential for recontamination of sediment (WDNR 2022b) confirms that sites upstream of KK River Reach 1 are not a substantial source of PCBs, PAHs, chromium, lead, or mercury, and the relatively low-level COC concentrations are unlikely to comprise an existing, upstream source of COCs to KK River Reaches 1 through 4.

2.6 Contaminant Release Mechanisms and Potential Transport Pathways

Figure 2-1 shows a general depiction of contaminant release mechanisms for the KK River Project Area. Permitted and historically unpermitted discharges and overland flow transport particulate and dissolved contaminants directly to surface water. CSOs may occur during large precipitation events. Groundwater impacted by contaminants may upwell through the sediment and discharge to surface water. PCBs, PAHs, and metals in these releases tend to adsorb to fine-grained sediment and organic material and may be incorporated into the sediment. Deposition and accumulation of relatively cleaner sediment over time results in the gradual burial of historical contamination.

The contaminated sediment in the riverbed can be resuspended by currents under high flow conditions, or by propeller wash, keel drag (friction between the keel of a vessel and the sediment surface) or in-water construction activities. Resuspended sediment can be transported and redeposited in downstream areas. Seiche effects may also play a minor role in resuspending contaminated solid particles and redepositing them some distance upstream. Impacted riverbed sediment may also release dissolved-phase chemicals into the surface water that is then transported within the project area or from one river to another (for example, from the KK River to the outer Milwaukee Harbor/Milwaukee Bay).

2.7 Recontamination Potential

The potential for recontamination of the KK River Project Area is considered to be low. Potential recontamination sources include point source discharges, non-point sources, releases from former industrial or commercial sites, and inflow from areas upstream of KK River Reach 1.

As discussed in Section 2.5, major reductions in point source activity were achieved by the Clean Water Act and the associated regulation and permitting of outfalls under WPDES. Many of the facilities that once operated with discharges to the river have either ceased operations or have been demolished. Further, the number and volume of sanitary sewage and CSOs that negatively impact the water quality in the estuary has decreased significantly since 1994; between 1994 and 2021, MMSD has captured and treated more than 98 percent of the stormwater and wastewater entering regional sewer system (MMSD 2022).

Non-point source runoff may continue to transport COCs to the river. However, various efforts are underway to reduce streambank erosion and flooding and restore streambed and riparian habitat (Section 2.5.2).

Recontamination potential from former industrial or commercial sites identified in Section 2.5.3 is low because of permitted monitoring of point sources and various additional WDNR requirements for investigation and mitigation of these sites. Remediation efforts at historically contaminated sites (for example, the former Solvay site and the South Marina Drive Storm Sewer site) are ongoing. The implemented control measures have succeeded in reducing the amount of contaminant loading from entering the system (WDNR 2022b).

Recontamination potential from sources upstream of KK River Reach 1 is low based on data from sediment samples collected during August 2021 field sampling of the upstream region between 60th Street and S. Chase Avenue (see Section 2.4) and information provided in WDNR's *Evaluation of Potential for Recontamination of Sediment Report* (WDNR 2022b). There was little sediment to sample upstream of Reach 1 (especially in concrete-lined channel portions) and samples had generally low levels of COCs compared to concentrations measured in Reaches 1 and 2 (WDNR 2022b). The relatively low concentrations of COCs detected in the upstream samples are unlikely to comprise an existing, upstream COC source to KK River Reaches 1 through 4 (WDNR 2022b).

2.8 Potential Receptors

As previously stated, 7 of the 11 BUIs in the Milwaukee Estuary AOC are related to contaminated sediment. The main receptors include benthic invertebrates and higher trophic-level organisms, including fish, some wildlife (piscivorous mammals and birds), and humans (Figure 2-1).

Benthic invertebrates live and feed in direct contact with sediment, pore water, and surface water and the contaminants present in these environmental media. Bottom-dwelling organisms form the base of the aquatic food web and are exposed to impacted sediment through the direct contact and ingestion pathways.

Fish serve as prey to piscivorous birds, mammals, and humans. Fish are exposed to contaminants in surface water via gill exchange and diets that include benthic organisms and smaller fish that feed on benthic organisms. This results in bioaccumulation in fish: fish tissue concentrations increase as smaller species are eaten by larger predatory species over time. Piscivorous birds and mammals are primarily exposed to bioaccumulative chemicals, such as mercury and PCBs in surface water and sediment, via diet when they consume prey (invertebrates and fish) that is in direct contact with such chemicals. Humans are also potential receptors of the contaminants through the consumption of fish or when exposed to contaminants in the water and sediment of the KK River during recreational activities.

3. Remedial Action Objectives and Remediation Target Areas

RAOs are statements that describe the overall goals that remedial action should achieve to provide adequate protection of human health and the environment while meeting regulatory requirements. GLNPO applies the following general RAOs to the remedial actions conducted as part of the GLLA:

- Reduction of exposure to COCs in sediment and pore water
- Reduction of COCs in biota
- Reduction of sediment-related toxicity
- Improvement of biota and biological communities
- Improvement in habitat quality
- Remediation of sediment contamination based on volume, area, and/or mass basis

Screening levels are COC concentrations that are used to develop RTAs that include areas and volumes of media (sediment) targeted for active remediation. After a preferred alternative is recommended, quantitative cleanup goals (CUGs) will be established for the project using site-specific screening levels as a starting point.

3.1 Site-specific Remedial Action Objectives

The site-specific RAOs for the KK River Project Area include remedial goals to improve environmental quality in the portion of the AOC where the project is located, and to support removing BUIs and delisting the AOC. In addition, Reach 3 and Reach 4 have currently authorized FNC status (Anchor QEA 2021b) of -21 feet LWD (557 feet NAVD88) in Reach 3 and -27 feet LWD (551 NAVD88) in Reach 4.

The following site-specific RAOs have been established for the KK River Project Area:

- Support removal of BUIs within the Milwaukee Estuary AOC by reducing the mass, volumes, and concentrations of COCs in the sediment. This will be achieved by addressing sediment with COCs exceeding the CUGs, thereby reducing exposure and risk to ecological and human receptors. The remediation of contaminated sediment in the project area will make progress towards eliminating the following sediment-related BUIs:
  - Restrictions on fish and wildlife consumption
  - Degradation of fish and wildlife populations
  - Fish tumors or other deformities
  - Bird or animal deformities or reproduction problems
  - Degradation of benthos
  - Restrictions on dredging activities
  - Loss of fish and wildlife habitat

  Evaluation of the pre- and post-remediation status for these listed BUIs will be included in RAP Updates for the Milwaukee Estuary AOC completed outside of this project.
- Reduce risks to human health and the environment from exposure to COCs in sediment. This will largely be accomplished by supporting the removal of BUIs through remediation of sediment with COC concentrations above the CUGs.
- Maintain depth requirements within the authorized FNC in KK River Reach 3 and Reach 4, and also in the Turning Basin adjacent to Reach 4.

3.2 Screening Levels and Remediation Target Areas

Sediment screening levels were selected in consultation with EPA and WDNR with the goal of consistent application across the various sediment project areas within the Milwaukee Estuary AOC (Menomonee River, Milwaukee River Downtown Reach, SMC, KK River, and Milwaukee Bay). Screening levels for total PAHs and metals (chromium, lead, and mercury) are based on PECs defined in the WDNR's CBSQG (WDNR 2003), as well as values based on 3 times the PECs. Screening levels for total PCBs are 1 mg/kg and 3 mg/kg.

RTAs were developed using three different screening level scenarios to provide flexibility in developing remedial alternatives for the KK River Project Area and to facilitate planning for the overall Milwaukee Estuary AOC. The three screening level scenarios are based on EPA and project partner agreement as follows:

- PECs for PAHs and metals and 1 mg/kg PCBs
- 3 times PECs for PAHs and metals and 1 mg/kg PCBs
- 3 times PECs for PAHs and metals and 3 mg/kg PCBs

The RTAs for the three screening level scenarios are presented on Figures 3-1 through 3-3. The RTAs for each scenario were developed using the computer application Earth Volumetric Studio (EVS) v2021.12.2 by Ctech. The software uses advanced volumetric gridding, geostatistical analysis, and visualization tools with integrated graphical user interfaces and modular analysis to model and visualize chemical, geological, and physical data. EVS integrated geostatistical tools provide quantitative evaluation of input data and allow for model outputs to be used in other programs such as geographic information systems (GIS) or AutoCAD (CAD) for data presentation and estimation of quantities for remedial action.

Sediment sample data sets used for the EVS modeling include:

- 2015 KK River Turning Basin Site Characterization performed by EPA GLNPO (CH2M 2016)
- 2016 Solvay Coke Superfund Investigation (Arcadis 2016)
- 2020 KK River and Outer Harbor/Nearshore Area Sediment Investigation by WDNR (Anchor QEA 2021b)
- 2020 KK River Channel Navigation Channel Sediment Investigation by USACE (Advanced Matrix-AEM Group JV, LLC 2021)
- 2021 KK River and Milwaukee Bay Data Gap Sediment Investigation by WDNR (Anchor QEA 2021c)
- 2022 FFS Predesign Investigation performed by EPA GLNPO (Jacobs 2023a)

Physical data including river boundary, sediment surface elevation, and interpolated native material surface elevation were used to define the lateral and vertical extents of the model domain. The lateral extents of the model represent the project area extent as digitized from aerial imagery. The most recent (2020) bathymetric survey was used to represent the top model surface. Native material elevations were obtained from sediment boring logs, input into GIS, and kriged using the "Topo to Raster" tool to develop the bottom model surface representative of native material.

The horizontal and vertical distribution of COC concentrations was evaluated by interpolating analytical data using geostatistical three-dimensional (3D) kriging in EVS. The model analyzes the spatial distribution and number of field data points, constructs a multidimensional variogram which is a best fit to the data set being analyzed, and then performs kriging in the model domain.

An iterative process was used to calibrate the model results to ensure that each model honored the input data set used to generate the model. Each COC data set was kriged at each of the respective screening levels. The kriging for each COC was performed individually and then the model results were combined in EVS to produce a 3D model shape with screening level exceedances for each of the three screening level scenarios. Each of the 3D model shape outputs for each COC at each respective screening level was reviewed visually to verify appropriate inclusion of sample points within the 3D model output. Each 3D model shape output was then reviewed to confirm whether it accurately interpolated between sample points and sufficiently extended horizontally and vertically. If these conditions were not met, this process was repeated for several iterations using different grid, data processing, and kriging settings to select the optimal model settings to best fit the analytical data.

Additional analysis was required to create the greater than (>) 50 mg/kg 3D model shape representative of TSCA-level sediment for the KK River Project Area. The two areas denoted as TSCA-dredge areas are identical on the three figures (Figures 3-1, 3-2, and 3-3) because the TSCA threshold (>50 mg/kg PCBs) is the same for all screening level scenarios. An isolated TSCA-dredge area is present in subsurface sediment in the KK River Project Area just downstream of the W. Lincoln Avenue Bridge (KKR-20-008). The larger TSCA-dredge area is located within the Grand Trunk Slip.

Following the development of the 3D model shape outputs for each COC, the applicable outputs were then merged to create a combined COC 3D model shape (PCBs, metals, and PAHs) representing each remedial alternative, which was then imported into Microstation V8i PowerGEOPAK Select Series10 CAD software for further processing. The additional processing performed within CAD included accounting for the effects of dredge offsets adjacent to the shoreline and bridge piers (assumed to be 10 feet) and utility crossings (assumed to be 15 feet)[9]. A typical side slope of 3:1 was also applied to all dredging areas from the top of sediment elevation at the offset to the target dredge elevation. Following implementation of dredge offsets and side slopes, an overdredge allowance of 0.5 foot was implemented to accommodate for variability in sediment removal by dredging. The CAD-modified 3D shapefile with offsets, side slopes, and overdredge allowance accounted for was then used to estimate the volume of sediment that would require dredging and identify contaminated sediment areas that may require in-place management because of requisite shoreline offsets and side slopes.

The estimated contaminated sediment volumes associated with each modeled scenario are summarized in Table 3-1. Note that the remediation removal volume estimated quantities are based on modeled results of screening level exceedances with modifications as previously described; however, actual dredge volumes may change during the remedial design phase of the project because of additional information and engineering considerations pertaining to shorelines, in-water structures, and utilities. In addition, the International Great Lakes Datum (IGLD) 1985 is in the process of being revised and will be replaced by IGLD 2020 (NOAA 2022). As part of this process, the LWD and authorized elevation for the FNC may also be revised, with current proposals indicating a lowering by 1 foot (NOAA 2022). The changes to the IGLD and the LWD are anticipated to be implemented by 2027. Any changes to the dredging elevations and volumes for FNC in the KK Project Area in response to the IGLD update will be incorporated during the remedial design.

[9] The use of 15-foot setbacks for utilities is a standard industry practice for this stage in a project. The setback requirements will be further refined during remedial design.

4. Remedial Technology Screening and Conceptual Alternatives Development

This section describes the identification and screening of potentially applicable remedial technologies and process options based on the RAOs and RTAs for the KK River Project Area, and introduces the concepts used for identifying conceptual remedial alternatives.

4.1 Remedial Technology Screening

The technologies and process options identified for screening are presented in Table 4-1. The objective of technology screening is to retain the best technology types and process options and streamline the development and evaluation of remedial alternatives. There are multiple process options associated with some of the technologies included in the table. The remedial technologies were evaluated using the qualitative screening criteria of effectiveness, implementability, and relative cost.[10] The last column in Table 4-1 provides a summary screening comment for each remedial technology and process option.

Each technology screening criterion considered the following:

- **Effectiveness:** Key considerations include:
  - The extent the technology and/or process option would be protective of human health and the environment and meet the RAOs
  - The level of treatment and removal that could be achieved
  - The extent to which the technology and process option has been demonstrated at similar sites.

  Protection of human health and the environment refers to the effectiveness of the technology in reducing the toxicity and mobility of contaminants in the sediment or in meeting RAOs. Level of treatment and removal refers to the degree to which the technology reduces contaminant mass.
- **Implementability:** Refers to the feasibility and/or availability of a given process option for this project area. Feasibility is further assessed based on technical and/or administrative considerations. Technical feasibility refers to the ability to adequately treat and remove the COCs given site-specific conditions. Certain options may be able to address the COCs but cannot be implemented because of factors like space limitations or unacceptable subsurface conditions. Administrative feasibility refers to the ability to meet factors such as local and state permitting requirements or regulatory reviews for approval. Potential permit requirements are listed in Appendix C of this document. Availability refers to factors such as the geographic location of the site and the extent to which the remedial option is commercially available.
- **Relative Costs:** Table 4-1 presents relative differences in cost magnitude (low, moderate, or high) taking into consideration anticipated capital and operations and maintenance costs. As such, cost considerations are provided for general assessment and were not used singly for technology screening decisions unless substantial cost differences are identified that would immediately preclude further consideration.

[10] These evaluation criteria are used for the technology screen only; additional evaluation criteria are used in Section 6 to evaluate the conceptual remedial alternatives.

Based on the evaluations performed for the KK River Project Area and WDNR's disposal alternatives evaluation (WDNR 2020), the following technologies were retained for further evaluation as components of remedial alternatives as summarized in Table 4-1:

- No Action (required and retained for comparison to other technologies)
- Sediment Removal
- Residuals Management
- Sediment Disposal
- Sediment Dewatering
- Sediment Containment
- In Situ Treatment
- Ex Situ Treatment

4.2 Conceptual Remedial Alternatives

The conceptual remedial alternatives were developed using a common set of technologies, and they primarily differ from each other with respect to the screening levels used to establish the RTAs. Within each RTA, sediment that can be feasibly removed will be dredged, and isolation or stabilization technologies will be applied to the sediment with COC concentrations exceeding CUGs that remain in place. The extent and characteristics of the material that remains in place after dredging is different for each screening level scenario.

Alternative 3A was subsequently developed based on discussions with project partners because of concerns about AOC-wide estimated dredge volumes exceeding the dredged materials management facility (DMMF) capacity. Alternative 3A was developed to provide a sub-alternative that reduces dredge volume by establishing a maximum sediment removal elevation. Similar sub-alternatives were not developed for Alternatives 2 or 4 because the sediment removal volume associated with Alternative 2 exceeds DMMF capacity when factoring in the removal quantities for the remaining AOC project areas, and the PCB screening level for Alternative 4 exceeded an acceptable level of protectiveness.

The alternatives that were further developed and evaluated are presented in Exhibit 4-1.

Exhibit 4-1. Conceptual Remedial Alternatives for the Kinnickinnic River Project Area

Alternative	Alternative Description
1	No Action
2	Remediate sediment with COC concentrations greater than the PECs for total PAHs or metals or greater than 1 mg/kg total PCBs: dredge (estimated total dredgeable volume of 703,500 CY) and cap sediment that cannot be removed (estimated 31 acres)
3	Remediate sediment with COC concentrations greater than the 3 times PECs for total PAHs or metals or greater than 1 mg/kg total PCBs: dredge (estimated total dredgeable volume of 391,500 CY) and cap sediment that cannot be removed (estimated 19 acres)
3A	Remediate sediment with the same COC concentrations as Alternative 3 above a maximum dredge elevation of 552.5 feet NAVD88 in KK River Reaches 1 through 3 and 546.5 feet NAVD88 in KK River Reach 4 and the adjacent Turning Basin: dredge (estimated total dredgeable volume of 281,000 CY), cap sediment that is not removed in Reaches 1 through 4 (estimated 15 acres) and place sand cover over sediment that is not removed from the Turning Basin (estimated 19 acres).

Alternative	Alternative Description
4	Remediate sediment with COC concentrations greater than the 3 times PECs for total PAHs or metals or greater than 3 mg/kg total PCBs: dredge (estimated total dredgeable volume of 357,500 CY) and cap sediment that cannot be removed (estimated 18 acres).

Two-dimensional representations of the RTAs for each of these alternatives (except for No Action) are presented on Figures 3-1 through 3-3, respectively. Details regarding the associated RTA volumes and the estimated volumes that are accessible are provided in Table 3-1. The estimated removal volumes and areas account for areas where the dredging extent will be limited by setback and side slope requirements. Additional aspects of the remediation that were addressed during alternatives development and evaluation are:

- Considerations for sediment with COC concentrations above screening levels remaining within the area of the shoreline offsets and side slopes that cannot be removed without additional analysis of structural stability or installation of additional supporting structure(s) to assure the remedy is protective and safe to implement.
- The remedy within portions of the FNC and Turning Basin for the KK River Project Area cannot interfere with navigation; it is assumed that the Milwaukee Port Authority will require an operational depth in the Turning Basin equal to the authorized FNC elevation for Reach 4 (551 feet NAVD88) and USACE will require at least 3 feet of clearance below the authorized FNC elevation to the final remediation surface. USACE requirements are based on previous communications during development of alternatives for the Menomonee River (CH2M 2019). To achieve the USACE-required 3 feet of clearance, it is assumed that sediment removal will be required to 3.5 to 4.5 feet below the FNC elevation for the application of residual sand cover (3.5 feet) or cap (4.5 feet) based on the following:
  - 1 foot of overdredge allowance beyond the authorized depth
  - 2 feet of clearance from the final remediation surface per USACE recommendations for navigation channels
  - 0.5 to 1.5 foot of depth for the application of the residual sand cover or cap, respectively (a 1.5 foot thick sand cover is assumed in the Turning Basin)

Additional detail regarding the remedial alternatives is provided in Section 5.

5. Remedial Alternatives Description

The remedial technologies and process options that remain after screening (see Table 4-1) are incorporated into the following remedial alternatives: Alternative 1 (No Action) and Alternatives 2, 3, 3A, and 4, which are shown in map view on Figures 5-1 through 5-4, respectively. The figures include the locations of bridges and utility corridors, areas identified for shoreline stabilization, dredging extents (including analytical results for locations with TSCA-level PCB concentrations in the Grand Trunk Slip and location KKR-20-008 in Reach 1), and the cap or sand cover extents for Alternatives 2 through 4. Figures 5-5 and 5-6 show example profiles for sediment removal and sediment cap and cover placement, respectively.

Dredging in the KK River Project Area is constrained by various site conditions, including bulkhead walls, bridges, utility crossings, and other infrastructure elements. Remedial design for removal of contaminated sediment adjacent to these in-water structures and utilities will require additional information and engineering considerations to address structural stability during and following the remedial action. Other technologies (for example, capping) likely will be needed to manage the material remaining in place in these areas.

Shoreline information for the KK River Project Area was reviewed as described in the *2021 Kinnickinnic River Project Area: Shoreline Assessment Technical Memorandum* (Jacobs 2022a). The shoreline assessment included visual observation of above-water natural or constructed shoreline materials, qualitative notation of structural conditions, critical structures, utility crossings, and sewer outfalls; however, it does not provide structural evaluations related to performing construction activities adjacent to the existing shorelines, bulkhead systems or in-water structures.

The lack of high-quality shoreline and bulkhead data is a limiting factor for optimizing sediment removal design, resulting in an assumption at the FFS stage for extensive capping of offsets from bulkheaded shorelines (10 feet), utilities (15 feet) and associated side slopes to the depth of removal. Capping will be required unless engineering evaluations can be performed as part of the remedial design. Guidance on post-capping best practices will be developed as part of the remedial design. Preventing bulkhead movement during proposed sediment removal is a critical factor for the success of the project and should be continually discussed with all stakeholders during each phase of the project. These discussions should consider the impact of bulkhead movement on existing facilities, methods of mitigating the anticipated bulkhead movement during construction, sequencing of dredging operations, and imposing limits on the vertical and horizontal extent of sediment removal and possible replacement of dredged material with aggregate.

Capping could be employed in non-navigational areas where sediment cannot be removed because of existing structures or below the required clearance depths in the authorized FNC. Capping and sand cover are effective in rapidly decreasing COC concentrations in the surface sediment. In situ stabilization could be considered for treating sediment adjacent to shorelines where stability is a concern and additional structural stability of the shoreline is desired. Natural recovery processes such as sediment deposition and accumulation may continue to reduce surface sediment COC concentrations in areas not targeted for active remediation.

WDNR's cost analysis of dredging and disposal of dredged material into the planned DMMF indicated preferred technologies for various sediment removal and disposal projects within the Milwaukee Estuary AOC (WDNR 2020). The analysis indicated hydraulic dredging with DMMF disposal is the most cost-effective alternative. WDNR performed an alternatives analysis to evaluate costs associated with the

disposal of impacted sediment from the Milwaukee Estuary AOC at an existing landfill versus disposal at the DMMF (WDNR 2020). The analysis showed that construction and operation of the DMMF is the most cost-effective disposal alternative compared to landfill disposal. The planned DMMF is located in the Milwaukee Bay Project Area, approximately 4,500 feet from the downstream end of the KK River Project Area (Figure 1-1). Design, permitting, and construction of the DMMF is ongoing by project partners including the MMSD, City of Milwaukee, Port of Milwaukee, WDNR, and We Energies with anticipated DMMF construction starting in late 2023 or early 2024 (MMSD 2022). The DMMF is anticipated to be owned and operated by the Port of Milwaukee (Foth 2018).

Table 5-1 summarizes the estimated quantities for sediment removal, residual cover, capping, sand cover, shoreline and utility reinforcement, and water treatment for the alternatives described in the sections that follow. The details and assumptions for each alternative are the basis for the cost estimates that are provided in Appendix D. Additional specificity for each element (for example, means and methods, equipment sizes and numbers, and production rates) will be developed during the remedial design. Additional process options may be evaluated during remedial design.

5.1 Alternative 1: No Action

The No Action alternative is included in the alternatives for comparison purposes. Under Alternative 1, no remedial actions are conducted to control exposure to contaminated sediment. Existing fish consumption advisories likely remain in place and BUIs are not addressed through sediment remediation. Natural degradation of contaminants is not likely to occur at a measurable rate or within a reasonable time period, although contaminated sediment may be gradually buried over time by deposition of sediment at urban background concentrations from upstream.

5.2 Alternative 2

Alternative 2 addresses sediment with COC concentrations greater than the PECs for total PAHs or metals (chromium, lead, mercury) or greater than 1 mg/kg for total PCBs. Alternative 2 assumes the lowest cleanup concentrations of the three alternatives and therefore has the largest removal area, removal volume, and capped area (Figure 5-1 and Table 5-1). Alternative 2 has an RTA of 90 acres, with a sediment removal area of approximately 79 acres, resulting in an estimated volume of 703,500 CY, of which 699,000 CY is non-TSCA-level sediment and 4,500 CY is TSCA-level sediment. Approximately 278,000 CY of the removal volume is in the Turning Basin and is non-TSCA sediment (Table 3-1, footnote b). Approximately 31 acres of the project area will be capped near bridges, utility crossings, and shoreline structures (Table 5-1). The in-water work during remedial action is estimated to take approximately 9 months.

5.2.1 Shoreline and Utility Corridor Stabilization

Removal of sediment near shorelines or utility crossings may not be safe or practical to accomplish without stabilization or reinforcement. In the portions of the RTA without TSCA-level sediment, dredge extents have been offset by 10 feet from the shoreline and by 15 feet near utility crossings, and the conceptual design assumes dredging at 3:1 side slopes to prevent slope failure (Figure 5-5A). Contaminated sediment left in place in the offset areas or beneath the side slopes will be covered with a cap as shown in plan view on Figure 5-1.

It is assumed that shorelines and utility corridors adjacent to TSCA-level sediment in the Grand Trunk Slip will be stabilized or reinforced before dredging to maximize the amount of TSCA sediment that can be removed without undermining stability. Approximately 1,100 lineal feet of shoreline stabilization may be

required in the Grand Trunk Slip at the approximate location shown on Figure 5-1J. The potential stabilization technologies include the following options:

1. Installation of a permanent SSP bulkhead along the existing shoreline and offset from the existing utility crossing. Sediment is dredged to the edge of the new bulkhead and a cap is placed over the gap between the original shoreline or utility corridor and the new bulkhead. The new sheetpile is then cut off at the cap surface.

2. Installation of temporary SSP along the existing shoreline and offset from the existing utility corridor (Figure 5-6). Sediment is dredged to the outer edge of the temporary SSP and a cap is placed over the gap between the original shoreline or utility corridor and the temporary SSP. Backfill material is placed adjacent to the temporary sheetpile wall to provide a stable slope. The temporary SSP is then extracted.

3. In situ stabilization (ISS) of the sediment along the existing shoreline or utility crossing to increase bearing capacity and shear strength of the sediment. Stabilizing agents are mixed into the sediment using augers to create a series of stabilized columns adjacent to the shoreline or utility crossing that provide necessary structural elements to reduce the risk of slope failure. Dredging is then performed immediately adjacent to the columns with a lower risk of undermining the shoreline or other feature. Contaminants are bound up within the stabilized matrix to reduce leaching of contaminants. The columns closest to the center of the channel are potentially reshaped after dredging to provide a suitable final slope.

The cost estimates for Alternative 2 assume stabilization and reinforcement using temporary SSP (stabilization technology Option 2) because:

- Installation of temporary SSP would require a minimal amount of backfill to be imported and placed to reinforce the shoreline for maintaining stability during removal of the temporary sheetpile.
- Elevated pH of the river is created during the ISS mixing process and requires pH control using carbon dioxide.
- During the ISS mixing process, swell is generated as a result of the injection of the reagents. The percentage of swell is dependent on the mix design but can lead to a 20 to 30 percent volume increase. Swell material is typically removed, solidified and disposed of resulting in increased cost due to the additional waste transportation and disposal.

5.2.2 Sediment Removal

Sediment with COC concentrations that exceed CUGs will be permanently removed wherever possible. Sediment removal will be accomplished using both hydraulic and mechanical methods. The staging area(s) to be used for processing debris and staging cap and cover will be identified during remedial design, but for costing purposes it is assumed to be in Baran Park as shown on Figure 5-1B. The staging area to be used for processing debris and staging of cap and cover materials for Reaches 2 through 4 is assumed to be downstream of Reach 1 and will be identified during remedial design, with the intent to locate the staging area as near as possible to the work area(s). The staging area to be used during TSCA sediment removal will be identified during remedial design, but an attempt will be made to locate the area as near as possible to the Grand Trunk Slip where the majority of TSCA-level sediment has been identified.

Figure 5-5 conceptually depicts removal and cover for sediment located in areas where shoreline reinforcement is not required. Figure 5-6 conceptually depicts the area within the Grand Trunk Slip, where shoreline reinforcement is required for removal of sediment with TSCA-level concentrations. Note that a relatively minor amount of TSCA-level sediment (estimated 174 square feet and 3 CY) is located in

Reach 1, in the middle of the river channel and just downstream of the intersection of Lincoln Avenue and S. 1st Street. The location and amount of this material do not require shoreline reinforcement, so shoreline reinforcement was not assumed for the cost estimate.

5.2.2.1 Hydraulic Dredging

It is assumed that hydraulic dredging will be performed from upstream to downstream and used wherever possible to remove non-TSCA-level sediment because it is expected to:

- Be more efficient and cost effective in the KK River Project Area than mechanical dredging
- Minimize turbidity during the dredging process
- Reduce impacts to dredging operations because of bridge openings, and
- Reduce impacts to commercial and recreational vessel traffic.

Sediment is loosened by a hydraulic cutter and removed by suction along with adjacent water into a leak-tight, high-density polyethylene pipeline; the sediment slurry is then pumped through the pipeline directly to the DMMF. Sediment removal using hydraulic dredging methods at sites with similar physical characteristics is typically conducted using an 8- to 14-inch swinging ladder cutter suction dredge to remove the sediment to the specified depths. However, additional specialty hydraulic dredge options are available without cutterheads such as plain suction, pneumatic submersible pumps, and diver-assisted hand-held hydraulic suction, which may be used in more sensitive areas near critical structures like utilities.

The depth attainable with the hydraulic dredge depends on several factors including the size of the ladder, lift cylinder, width of the hull, and length of the hull. An operational evaluation was completed to determine the optimal cutter suction dredge or combination thereof. The evaluation considered depth of water in various portions of the KK River Project Area, depth of sediment removal, production rates, and the volume of water generated. Combined use of 8-inch, 12-inch or 14-inch diameter cutter suction dredge equipment is deemed to be most cost effective for this project area.

Approximately 20,000 lineal feet of pipeline for each 8-inch and 12-inch dredge and approximately 16,000 lineal feet of pipeline for the 14-inch dredge will be required for Alternative 2 hydraulic pumping operations, starting at the upstream extent of removal in the KK River Project Area and ending at the DMMF, including an estimated six pumping booster stations. As the work progresses from upstream to downstream, the pipeline will be shortened and booster pump stations relocated as required.

Turbidity control, such as a silt or bubble curtain, may be implemented to prevent migration of suspended sediment. Continuous upstream and downstream turbidity monitoring may be required during dredging.

5.2.2.2 Mechanical Dredging

For mechanical dredging, a crane or excavator is placed on a floating barge. An environmental bucket that minimizes the loss of sediment and entrained water is used to remove sediment to the specified dredge cut elevation. The dredged material is placed in a scow for transport to the upland staging area. Turbidity controls and turbidity monitoring are used to minimize transport of resuspended sediment away from the project area.

TSCA-level sediment will be removed prior to non-TSCA removal using mechanical dredging methods because it will be segregated from non-TSCA sediment and processed for offsite landfill disposal. The dredged TSCA material is dewatered and stabilized in the upland staging area before truck transport and disposal at a selected upland disposal facility. Mechanical dredging is recommended for removal of TSCA

sediment because it requires a smaller footprint for an upland staging area for dewatering, processing (i.e. solidification if necessary), and loading out for transport and disposal, and a much smaller temporary water treatment plant compared to what is needed for hydraulic dredging operations.

Mechanical dredging will also be used to remove non-TSCA sediment that cannot be readily accessed with the hydraulic dredge due to the depth limitations of the hydraulic dredge relative to the surface water elevation at the time of dredging. The FFS assumes a hydraulic dredge depth of 30 feet below the surface water elevation will be attainable. Approximately 265,000 CY of sediment is deeper than -30 feet LWD and is assumed to require mechanical dredge removal. Non-TSCA-level sediment removed by mechanical dredging can be transported to the upland staging or screened, slurried, and pumped to the DMMF.

5.2.3 Residuals Management

In areas where the full vertical extent of contamination above the CUGs is removed, a 0.5-foot thick residual sand cover is placed on the post-dredge surface (Figure 5-5). Clean sand is used to reduce the mobility of dredging residuals and lower residual COC concentrations in post-dredge surface sediment. The sand cover may also accelerate re-establishment of benthic communities disrupted during the dredging activities. Sand placement methods will be selected to provide a controlled application by either casting or directly placing the sand to avoid displacement or significant penetration into the underlying sediment. Means to verify the final thickness of the residual sand cover will be specified in the remedial design documents. The project area is primarily net depositional (WDNR 2022b) and additional upstream sediment is expected to accumulate across the project area following completion of remediation activities.

Approximately 71,000 CY of sand (assuming an average placement thickness of 0.75 feet) will be needed to provide residual cover over the post-dredge surface of approximately 59 acres. It is assumed that the sand will be obtained at an offsite source, but particle size segregation and washing, if determined to be feasible from treatability study results, may also provide an opportunity for beneficially reusing the coarse fraction of dredged material for residual sand cover.

The final elevation of the residual sand cover will not exceed the USACE requirements for working in the FNC or the pre-dredge sediment elevations, so there will be no net decrease in the cross-sectional flow area of the river. Therefore, cover placement will not negatively impact susceptibility to flooding or reduce conveyance within the river.

5.2.4 Sediment Transport, Dewatering, and Disposal

All hydraulically- and mechanically dredged, non-TSCA sediment will be pumped downstream in a pipeline for management and disposal at the DMMF. The pipeline will be submerged in the water in some areas to minimize navigational disruption to the waterways. The hydraulic pipeline will be monitored during pumping to assure rapid and appropriate repairs of leaks or other malfunctions. The pipeline will surface at booster pumps located on barges and at the DMMF.

The hydraulically dredged sediment, which typically contains up to 90 percent water by weight, will be passively dewatered by settling and evaporation within the DMMF. The sediment may be treated with an appropriate dose of coagulant, flocculant, or combination thereof to aid suspended sediment sedimentation rates. Chemical dosing will be determined based on the results of a sediment treatability study.

A temporary water treatment system will be constructed near the DMMF for the treatment of supernatant water from the DMMF before discharge to Lake Michigan under a WPDES permit. The treatment process required to meet the WPDES permit requirements will be developed during the treatability study and

remedial design but are expected to consist of an ultra-high capacity clarifier, metals precipitation, sand filters, bag filters, and granular activated carbon treatment system.

It is assumed that the DMMF will be designed to provide sufficient settling time for hydraulically pumped sediment. The minimum residence time required will be finalized based on the results of the treatability study.

TSCA and non-TSCA-level material will be managed as separate waste streams. Mechanically-dredged TSCA sediment will be placed in scows and transported to an upland staging area for dewatering and solidification before transfer into trucks and transport to an offsite disposal facility. The sediment and associated debris removed from TSCA areas will be handled, staged, and disposed of as TSCA in a Subtitle C landfill. An upland staging area for the KK River Project Area will be identified during the remedial design. Dredged sediment transferred to the upland staging area from scows will be passively dewatered through gravity drainage. Stabilization or solidification agents such as fly ash, Portland cement, quicklime, or similar materials may be added to the sediment to meet requirements for transport to and disposal at an offsite landfill. Results from the treatability study will assist in selecting the most suitable stabilization/ solidification amendment material(s) and dose rate percentage(s). Stabilized sediment may be stockpiled and continue to solidify until ready for loading into a truck. Stabilized sediment and debris will then be directly loaded into trucks for transport to an approved Subtitle C landfill.

Excess free water generated from mechanical dredging will be pumped from the scows to temporary storage tanks. Free water from gravity drainage, decontamination activities, and storm events at the upland staging area also will be collected and pumped to the temporary storage tanks. A temporary water treatment system will be located at the staging area to treat collected water and discharge back to the river under a WPDES permit.

5.2.5 Particle Size Segregation and Washing

If feasible, particle size segregation for the non-TSCA sediment removed during dredging operations may be considered for the KK River Project Area. Grain size data indicate that sediment in the KK River Project Area contains a significant amount of sand (average of 46 percent sand by weight for all the samples collected in the KK River Project Area) that may be suitable for beneficial reuse as sand cover within the Milwaukee Estuary AOC or for other purposes. Vibrating screens, hydrocyclones, and wash bars would be used to separate sand from the fine-grained fraction, allowing disposal of only fine-grained material with higher COC concentrations in the DMMF.

Particle size segregation and washing would require water as part of the process. Reusing the treated water for washing purpose reduces the need for handling and treatment of additional water at the DMMF. The benefits of reusing sand as cover material may outweigh the disadvantages of acquiring and transporting large volumes of sand. An additional benefit of reusing the coarser fraction of dredged sediment is a reduction in the amount of material that requires DMMF disposal, thereby reducing DMMF capacity requirements.

The feasibility and cost effectiveness of particle size segregation will be further investigated as part of a treatability study and during the remedial design. Washing and testing will be performed to confirm that chemical concentrations of the segregated sand meet project requirements for reuse. For the purposes of the FFS, it is conservatively assumed that particle size segregation will not be feasible and all hydraulically pumped sediment will be placed in the DMMF.

5.2.6 Sediment Containment – Cap

Sediment capping will be implemented in areas where contaminated sediment cannot be feasibly dredged (see Section 5.2.1). Caps will be designed to isolate the underlying contaminated sediment and resist erosion from river flows and propeller wash. Conceptual profiles of caps are shown on Figure 5-5.

Institutional controls may be employed in conjunction with caps; these may include navigational, anchoring or future dredging restrictions. Such controls minimize the potential for cap disturbance and exposure of underlying sediment contamination. The material specifications, thicknesses, and placement methods will be determined during the remedial design. All TSCA-level sediment will be removed by dredging if possible; however, in areas where dredging is not feasible, a cap may be required to achieve the RAOs. It is estimated that 92,000 CY of cap (18 inches of thickness assumed) across 31 acres will be required to cover sediment left in place adjacent to shorelines and utility corridors, in stabilized or reinforced shoreline areas, and beneath dredged side slopes. The final elevation of the caps will not exceed the USACE requirements for working in the FNC. Institutional controls and long-term monitoring and maintenance requirements for caps will be discussed further with project partners during remedial design.

5.2.7 Confirmation Sampling and Other Verification Activities

Post-dredge sediment confirmation sampling is anticipated to be required in TSCA sediment removal areas, as well as for non-TSCA areas that are not designated for capping. Results of confirmation sampling will be used to assess the success of dredging in reducing COC concentrations below CUGs in accordance with the post-dredge management plan developed during design. The final thicknesses of the residual sand cover and caps will be verified using sampling methods such as coring or collection pan testing. A post-remediation bathymetric survey also will be performed to confirm final post-remediation elevations. The specific confirmation sampling and verification approaches will be documented in the appropriate remedial design document, such as a Construction Quality Assurance/Construction Quality Control plan and the associated field sampling plans.

5.2.8 Debris Removal and Disposal

The types and amount of debris in the KK River Project Area have not been quantified; however, a significant amount of debris may be present because of historical waterfront uses and the urban setting. Side-scan sonar and magnetometer surveys will be conducted during remedial design to quantify and locate large debris that will require removal. Debris will be removed using mechanical means. The size of debris that can be removed will be limited by the lift capacity of the mechanical equipment that the contractor has onsite. Additional costs to the project will be incurred if the contractor is required to mobilize additional larger equipment or perform diver-assisted removal.

Debris removed from TSCA areas will be handled, staged, and disposed of as TSCA-level material in a Subtitle C landfill. For the purposes of estimating disposal volumes and costs, it is assumed that debris removed from non-TSCA areas will be transported to and disposed of in the DMMF. Debris management and disposal, including identification of potential recycling opportunities, will be addressed further in remedial design.

5.3 Alternative 3

Alternative 3 addresses sediment with COC concentrations greater than 3 times the PECs for total PAHs or metals (chromium, lead, mercury) or greater than 1 mg/kg for total PCBs. Alternative 3 (Figure 5-2) has

the midsized RTA of 56 acres as compared to Alternatives 2 and 4. Remedial activities for Alternative 3, including dredge offsets and 3:1 side slopes, are identical to those described for Alternative 2, except the quantities are different as summarized in Table 5-1. The sediment removal area for Alternative 3 covers 42 acres with a removal volume of 391,500 CY. Approximately 209,000 CY of the removal volume is in the Turning Basin (Table 3-1, footnote b). Approximately 143,800 CY is located deeper than -30 feet LWD and is assumed to require mechanical dredge removal. Approximately 19 acres of the project area will be capped near bridges, utility crossings and shoreline structures. In-water remedial action work is assumed to take approximately 6 months.

5.4 Alternative 3A

Alternative 3A addresses sediment as described in Alternative 3 with the addition of implementing a maximum sediment removal elevation of 552.5 feet NAVD88 in Reaches 1 through 3 and 546.5 feet NAVD88 in Reach 4 and the Turning Basin. Remedial activities for Alternative 3A are identical to those described for Alternative 2, except for implementation of the maximum dredge elevation, capping contaminated sediments below the maximum dredge elevation in Reaches 1 through 4, and placing a sand cover up to 1.5 feet thick over contaminated sediments below the maximum dredge elevation in the Turning Basin. For the purposes of the FFS, sand cover, rather than an engineered cap, is assumed for the Turning Basin because of concerns about how the potential constraints of maintaining an engineered cap would conflict with Port operations. The primary difference between an engineered cap and sand cover is that an engineered cap is designed to be permanent and immobile, whereas sand cover is not. The intent of using sand cover is to maintain flexibility in current and future Port operations and retainage of an operational depth at the same elevation as the adjacent FNC.

The Alternative 3A RTA (Figure 5-3) is identical to the Alternative 3 RTA (Figure 5-2); however, the removal volume for Alternative 3A is 110,500 CY lower than Alternative 3. The majority of the reduction in the removal volume is from the Turning Basin (Table 3-1, footnote b). The total removal volume of Alternative 3A is 281,000 CY, which is the lowest of any of the alternatives (Table 3-1). Approximately 35,000 CY of the total volume is below -30 feet LWD and is assumed to require mechanical dredge removal. An estimated 15 acres of the project area will be capped in Reaches 1 through 4 with 19 acres of sand cover placed in the Turning Basin. In-water remedial action work is assumed to take approximately 5 months. Alternative 3A requires 101,000 CY of cap and sand cover material (47,000 CY of cap and 54,000 CY of sand cover material) compared to Alternative 3 (58,000 CY).

As noted in Section 3.2, the IGLD is in the process of being revised, likely resulting in the LWD and FNC being lowered by 1 foot, but not until 2027 (USACE 2022). A lowering of the FNC by 1 foot would potentially result in additional volume to be removed for Alternative 3A; changes to the dredging elevations and volumes in response to the IGLD update will be incorporated during the remedial design.

5.5 Alternative 4

Alternative 4 addresses sediment with COC concentrations greater than 3 times the PECs for total PAHs or metals (chromium, lead, mercury) or greater than 3 mg/kg for total PCBs. Alternative 4 has the smallest RTA of 54 acres (Figure 5-4) but is only 2 acres smaller than Alternatives 3 and 3A (Table 5-1). Remedial activities for Alternative 4 are identical to those described for Alternative 2, except the quantities are different as summarized in Tables 3-1 and 5-1. The sediment removal area for Alternative 4 covers 38 acres with a removal volume of 357,500 CY (Table 5-1). Approximately 185,000 CY of the removal volume is in the Turning Basin (Table 3-1). Approximately 127,900 CY of sediment is located deeper than -30 feet LWD and is assumed to require mechanical dredge removal (Table 3-1). Approximately 18 acres of the project area will be capped near bridges, utility crossings and shoreline structures (Table 5-1). The

timeframe for Alternative 4's in-water remedial action is assumed to be similar to Alternative 3A (approximately 5 months).

5.6 Grand Trunk Wetland Remedial Action and Habitat Restoration

The Grand Trunk Wetland remedial action and habitat restoration will be performed as part of the GLLA remedial action project for KK River Project Area and therefore is being included as part of the FFS and future MKE Estuary AOC remedial design activities. Per the RAOR (Sigma 2021), the City and WDNR identified remedial action option 2 for the Grand Trunk Wetland. A general description of the Grand Trunk Wetland project is included in Section 2.3.3 and the approximate boundaries are indicated on Figures 5-1J, 5-2J, 5-3J, and 5-4J. The estimated volume of soil to be removed from the Grand Trunk Slip during this project is included on Table 3-1 and approximate costs for implementation of remedial option 2 with associated habitat restoration per the RAOR (Sigma 2021) are included in the cost estimate (Appendix D). Remedial option 2 elements are summarized herein. Further assessment of soil remediation and restoration activities for the Grand Trunk Wetland will be determined during remedial design to ensure consistency with the GLLA project remedial action. Assumptions related to GLLA implementation of remedial action option 2 include the following (actual plans will be finalized during MKE Estuary AOC remedial design activities):

- Removal of non-TSCA-level soil during culvert replacement and excavation within the Grand Trunk Wetland east of the culvert beneath S. Marina Drive (53,700 CY).
- The RAOR indicates that excavated soil east of the culvert will be dewatered and transported to an offsite disposal facility (offsite landfill or the existing USACE confined disposal facility). Jacobs reviewed the Grand Trunk design and modified this assumption as follows: excavated non-TSCA soil will be transported by pipeline to the DMMF and the temporary water treatment system constructed near the DMMF will be used. Excavated soil will be screened, slurried, and pumped through the pipeline to the DMMF. Screenings not pumped through the pipeline will be hauled to the staging area for subsequent loadout, transport, and disposal at the DMMF. These modifications to the implementation of the remedial action option 2 will result in cost and schedule efficiencies.
- An engineered cap consisting of a 12-inch chemical isolation layer (silty sand that is amended with zero-valent iron) overlain by a 6-inch gravel layer will be placed west of the culvert beneath S. Marina Drive. Per Jacobs review of PCB data within the Grand Trunk Slip and understanding of the potential source of PCBs from the outfall immediately west of the culvert, it is assumed for the purposes of the FFS that sediment west of the culvert with TSCA-level PCBs will be dredged and disposed of within a Subtitle C landfill as part of the GLLA work.
- East of and at the base of the culvert, and below the projected OHWM: placement of a 12-inch layer of habitat substrate consisting of topsoil and fill to provide chemical sorption of COCs and act as a chemical isolation layer of an engineered cap.
- For water treatment and management, the RAOR assumes that water contacting or emanating from impacted soil or sediment will be treated using an onsite water treatment system. Based on review of the Grand Trunk Slip design and for the purposes of the FFS, Jacobs assumes that non-TSCA soil will be screened, slurried, and pumped through a pipeline to the DMMF. Utilizing the temporary water treatment system constructed near the DMMF, treatment of supernatant water from the DMMF will be treated before discharge to Lake Michigan under a WPDES permit. Additionally, water within the non-TSCA excavation area can be managed to facilitate excavation.

6. Detailed Analysis of Alternatives

6.1 Evaluation Criteria

The remedial alternatives developed in Section 5 were evaluated using the criteria described herein to support selection of a recommended remedy. The criteria provide the basis for comparing expected alternative performance and are used to identify the advantages and disadvantages of each alternative and trade-offs between alternatives. The evaluation criteria consider both EPA's nine criteria for evaluating remedial alternatives in feasibility studies[11] and WDNR's evaluation criteria for selecting remedial actions.[12] The criteria are divided into three groups: threshold, balancing, and modifying criteria, summarized as follows:

- **Threshold Criteria**
  - Compliance with environmental laws and standards
- **Balancing Criteria**
  - Long-term effectiveness
  - Short-term effectiveness
  - Implementability
  - Restoration time frame
  - Cost
- **Modifying Criteria**
  - Project partner acceptance

6.1.1 Threshold Criteria

Threshold criteria must be met by an alternative for it to be eligible for selection as a remedial action. The single threshold criterion is compliance with environmental laws and standards. To be eligible for selection, an alternative must meet applicable federal, state, and local regulations, or justification must be provided that a waiver is appropriate.

Compliance with applicable federal, state, and local regulations is one of the statutory requirements of remedy selection. Applicable regulations are cleanup standards, standards of control, and other substantive environmental statutes or regulations. Applicable requirements address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a site. The assessment of this criterion describes how the alternative complies with applicable federal, state, and local regulations or presents the rationale for waiving an applicable requirement. The identification of potentially applicable regulations and associated permits relative to the remedial alternatives is summarized in Appendix C.

6.1.2 Balancing Criteria

Unlike the threshold criteria, the balancing criteria weigh the trade-offs between alternatives. A low rating for one balancing criterion can be compensated for by a high rating for another criterion. The five

[11] 40 Code of Federal Regulation § 300.430 (e)(9)(iii)
[12] WDNR Chapter NR 722.07(4) and NR 722.09 (2)

balancing criteria described in the following subsections are used to identify the advantages and disadvantages of each alternative and weigh the trade-offs between alternatives.

6.1.2.1 Long-term Effectiveness

This criterion considers the degree to which an alternative will protect human health and the environment over time. Long-term effectiveness considers the ability of the alternative to achieve RAOs and contribute to BUI removal. It includes evaluation of the amount of residual contamination anticipated to be left in place, the adequacy and reliability of long-term controls in preventing exposure to any residual contamination that is left in place, and the potential for recontamination following the remedial action. Long-term effectiveness also evaluates the expected performance of the alternative in response to extreme storm events and climate change.

6.1.2.2 Short-term Effectiveness

The short-term effectiveness criterion assesses potential adverse impacts on public health, safety, welfare, and the environment during the construction and implementation of the alternative. It considers protection of workers during the remedial action, protection of community during the remedial action, and environmental impacts of the remedial action. It also considers the time until the RAOs are achieved.

6.1.2.3 Implementability

This criterion considers both technical and administrative feasibility of the alternative. The technical feasibility evaluation considers the ease of implementation, reliability, constructability, availability of goods and services needed for its implementation materials, and identifies potential difficulties and constraints associated with onsite construction or offsite disposal and treatment. The administrative feasibility evaluation considers the activities and time needed to obtain necessary licenses, permits or approvals, the need for institutional controls, and degree of coordination with other agencies.

6.1.2.4 Restoration Timeframe

The restoration timeframe criterion considers the time required to restore trees, vegetation, and habitat that was cleared or disturbed to access work areas and conduct the remedial action.

6.1.2.5 Cost

Cost encompasses the design, engineering, construction, and operations and maintenance costs incurred over the life of the project. The assessment of this criterion is based on the estimated capital costs, annual operations and maintenance costs, and total present worth of the costs for each alternative. Present worth is a method of evaluating expenditures that occur over different lengths of time. This allows costs for remedial alternatives to be compared by discounting the costs to the year in which the alternative is implemented. The present worth of a project represents the amount of money, which if invested in the initial year of the remedy and disbursed as needed, would be sufficient to cover the costs associated with the remedial action. These estimated costs are expected to provide an accuracy of plus 50 percent to minus 30 percent. Appendix D provides a breakdown of the cost estimate for each alternative that is described in Section 5.

The cost range applies only to the alternatives as they are described and does not account for changes in the scope of the alternatives. Selection of specific technologies or processes to configure remedial alternatives is intended not to limit flexibility during remedial design but to provide a basis for preparing

cost estimates. The specific details of the remedial actions and cost estimates are refined during the remedial design.

6.1.3 Modifying Criterion

The modifying criterion is project partner acceptance. This criterion will be evaluated after the project partners have reviewed and provided comments on the remedial alternatives and associated individual and comparative alternative analyses. Project partner acceptance will be considered when selecting the recommended alternative, which will be presented in this FFS Report.

6.2 Alternatives Analysis

Alternatives 1 through 4 were evaluated using the threshold and balancing evaluation criteria. Evaluation results for each criterion are summarized in Table 6-1. The differences in alternatives arise from differences in the CUGs and associated areas and volumes of each RTA, rather than from different remediation approaches. Key findings of the alternatives analysis are as follows:

- Alternatives 2, 3, 3A, and 4 can be designed to comply with applicable federal, state, and local regulations, and therefore meet the threshold criterion.
- Alternative 2 has the greatest long-term effectiveness because it is based on the most conservative (lowest) set of CUGs. It results in the greatest reduction of mass, volume, and concentration of COCs in sediment.
- Alternatives 3A and 4 have the greatest short-term effectiveness because the remedies would be completed in the shortest period of time (5 months) compared to Alternatives 2 and 3, which are estimated to require 9 and 6 months, respectively. Alternative 4 (54 acres) and Alternatives 3 and 3A (56 acres) have similar RTAs and impact the smallest areas, while Alternative 2 impacts a significantly greater area (90 acres). Short-term effectiveness does not apply to Alternative 1.
- Alternative 3A is the most implementable from a technical standpoint because it has the lowest removal volume and meets the DMMF capacity on an AOC-wide basis, whereas Alternatives 2, 3, and 4 do not. All of the alternatives (except Alternative 1) include capping and therefore will require agency coordination and approval. Alternative 3A has the smallest cap area (15 acres) in Reaches 1 through 4, with an additional 19 acres of sand cover assumed for placement within the Turning Basin. The other construction, implementation, and administrative challenges are similar for Alternatives 2, 3, 3A and 4.
- Alternative 3A has the lowest estimated cost ($88.2M). Alternatives 4, 3, and 2 are progressively more costly ($93.6, $99.1M, and $142.1, respectively). The Grand Trunk Wetland remediation and restoration project accounts for $7.6M of the cost of all alternatives (except Alternative 1).

7. Recommended Alternative

The project partners have identified Alternative 3A as the recommended alternative for the KK River Project Area. Alternative 3A addresses sediment with COC concentrations exceeding CUGs (3 times PECs for PAHs and metals and 1 mg/kg for PCBs) through dredging, placing residual sand cover in dredged areas, capping where contaminated sediment cannot be feasibly removed or is below the maximum dredge elevation in in Reaches 1 through 4, and applying sand cover below the maximum dredge elevation in the Turning Basin. The dredging, capping, and sand cover components of Alternative 3A are shown on Figures 7-1A through 7-1N. The recommended alternative will achieve the site-specific RAOs by reducing the mass, volume, and concentrations of COCs in sediment, reducing risks to human health and the environment from exposure to COCs in sediment, and maintaining depth and operational requirements within the authorized FNC and Turning Basin. It will also maintain depth requirements for recreational vessels. The remedy will contribute to the eventual removal of BUIs and delisting of the Milwaukee Estuary AOC.

The CUGs for Alternative 3 are recommended for application in all AOC project areas (except the Floodplains Reach). Alternative 3A was selected for the KK River Project Area based on evaluation of dredged material volume estimates for disposal within the DMMF and consideration of project costs on an AOC-wide basis. Alternative 3A provides a similar level of protectiveness and has a similar cost as Alternative 3 but reduces the dredge volume by 110,500 CY by establishing a maximum dredge elevation in the KK River Project Area. Alternative 3A has the lowest cost of the evaluated alternatives and the reduced dredge volume helps meet the available DMMF capacity on an AOC-wide basis. The estimated cost of recommended Alternative 3A is $88.2M.

The recommended alternative will be further refined during remedial design. This refinement will focus on the dredge areas and sand cover proposed for the Turning Basin to maximize long-term effectiveness of the remedy in accord with Port operations. In addition, a decision framework will be developed to identify and prioritize areas within Reaches 1 through 4 for additional sediment removal if sufficient DMMF capacity and project resources are available. Areas where maintaining a cap is expected to be challenging will be identified, and institutional controls for management of residual contamination in the Turning Basin and long-term monitoring and maintenance requirements for caps will be discussed further with project partners.

Existing and projected post-remedy surface-weighted average concentrations (SWACs) for COCs in the KK River Turning Basin were calculated for Alternative 3A to confirm remedy protectiveness. The SWAC methodology and results are further described in Appendix E. The Turning Basin SWACs are summarized in Exhibit 7-1. The calculations indicate that post-remediation SWACs (after sand cover placement) are lower than existing conditions, Alternative 3 CUGs, and PECs for each COC.

Exhibit 7-1. Kinnickinnic River Turning Basin – Surface-weighted Average Concentrations (mg/kg) for Pre- and Post-Remediation Scenarios – Alternative 3A

Surface Weighted Average Concentration Projections (mg/kg)	PCB	PAH	Chromium	Lead	Mercury
PEC	0.67	22.8	110	130	1.1
Alternative 3 CUGs	1	68.4	330	390	3.3
Existing	0.62	13	153	133	0.49
Post-Remedy	0.31	8	77	64	0.23

The recommended alternative was the subject of public outreach efforts accomplished during four public informational meetings held on the following dates: November 02, 2023; February 15, 2024; April 25, 2024; and June 14, 2024. These meetings were conducted to share information regarding the FFS recommended alternatives and to answer questions regarding the reports and the AOC-wide project. Questions posed at the meetings or posted to an online website were summarized into a Frequently Asked Questions document included as Appendix F to this Final FFS Report.

8. References

Advanced Matrix-AEM Group JV, LLC. 2021. *Milwaukee Federal Navigation Channel Sediment Sampling and Analysis, Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin*. Prepared for U.S. Army Corps of Engineers Detroit District. May 17.

AECOM. 2018. *Limited Sediment Assessment Grand Trunk-Bay View Restoration Project.* Prepared for the Redevelopment Authority of the City of Milwaukee. December.

Anchor QEA. 2021a. Scope of Work [to perform KK River Reach 1 Source Investigation and Project Step-Out Sampling]. June 16.

Anchor QEA. 2021b. *100% Site Investigation Report, Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern*. August.

Anchor QEA. 2021c. *2021 Sediment Sampling Technical Memorandum, Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern*. Draft. November.

Arcadis. 2016. *Remedial Investigation Report Milwaukee Solvay Coke & Gas Site – 311 East Greenfield Avenue, Milwaukee, WI.* August.

Baldwin, Austin K., Steven R. Corsi, Michelle A. Lutz, Christopher G. Ingersoll, Rebecca Dorman, Christopher Magruder, and Matthew Magruder. 2016. "Primary Sources and Toxicity of PAHs in Milwaukee-Area Streambed Sediment." *Environmental Toxicology and Chemistry.* Vol. 999, Number 9999. pp. 1-14. November.

CH2M HILL, Inc. (CH2M). 2011. *Remedial Action Report, Kinnickinnic River Sediment Removal Project, Milwaukee, WI.* Final. Prepared for EPA. March 14.

CH2M HILL, Inc. (CH2M). 2016. *Assessment of Contaminated Sediments in the Kinnickinnic River Mooring Basin in the Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin*. Prepared for EPA's Great Lakes National Program Office. January.

CH2M HILL, Inc. (CH2M). 2019. *Focused Feasibility Study, Menomonee and Milwaukee Rivers, Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin.* May.

Dow, Brennan, Wisconsin Department of Natural Resources. 2023. Personal communication (email) with Huck Raddemann, Jacobs. March 23.

Foth Infrastructure & Environment, LLC (Foth). 2018. Investigation Results, Milwaukee Harbor Confined Disposal Facility – Dredged Material Disposal Facility, Milwaukee Estuary Area of Concern. June.

GRAEF. 2018. *Kinnickinnic River Watershed Green Infrastructure Plan*. Prepared for the Milwaukee Metropolitan Sewerage District.

GRAEF, Hey and Associates, Inc., and CDM Smith. 2017. *Kinnickinnic River Watershed Flood Management Plan*. Final Report. Prepared for Milwaukee Metropolitan Sewerage District. May 4.

Harbor District Inc. (HDI). 2017. *Harbor District Water and Land Use Plan*. December. https://city.milwaukee.gov/DCD/Planning/PlansStudies/AreaPlans/HarborDistrict.

Harbor District Inc (HDI). 2022. Personal communication with Aaron Zeleske during site walk of the Kinnickinnic River Reach 1 between Chase Avenue and Becher Streets. August 3.

HNTB Corporation (HNTB). 2014. *Kinnickinnic River Flushing Station Improvements Feasibility Study*. October.

Jacobs. 2022a. *2021 Kinnickinnic River Project Area: Shoreline Assessment Technical Memorandum*. Final. March 4.

Jacobs. 2022b. *2021 Geotechnical Sediment Sampling Technical Memorandum.* Final. March 18.

Jacobs. 2023a. *2022 Predesign Investigation Treatability Study and Toxic Substances Control Act Site Sampling Technical Memorandum.* Draft. February 3.

Jacobs. 2023b. *Remedial Alternatives Evaluation Technical Memorandum for the Kinnickinnic River Project Area.* March.

Jacobs 2023c. *Focused Feasibility Study Report –Kinnickinnic River Project Area, Milwaukee Estuary Area of Concern.* Draft Final. September.

Jannene, Jeramey. 2021. "Planned Riverwalk Lets You Touch the Water." *Urban Milwaukee*. November 22. https://urbanmilwaukee.com/2021/11/22/eyes-on-milwaukee-planned-riverwalk-lets-you-touch-the-water/

Kort, W. and K. Taylor. 2017. *The Kinnickinnic River Watershed Updated Implementation Plan – A Comprehensive Watershed Restoration Plan.* Southeastern Wisconsin Watersheds Trust, Inc. December.

Milwaukee Metropolitan Sewerage District (MMSD). 2022. *Kinnickinnic River Flood Management*. Accessed November 2022. https://www.mmsd.com/what-we-do/flood-management/kinnickinnic-river

Montgomery Associates Resource Solutions, LLC. (Montgomery). 2017. *Kinnickinnic River I-94 to Becher Street Feasibility Study.* Final Report. March.

National Oceanographic and Atmospheric Administration (NOAA). 2022. *International Great Lakes Datum*. Center for Operational Oceanographic Products and Services. https://tidesandcurrents.noaa.gov/datum-updates/igld/index.html. Accessed October 12, 2022.

Port of Milwaukee. 2023. Personal communication (meeting) with Jacobs. MKE Estuary AOC Weekly Partners Meeting. February 2.

Seaworks Group LLC (Seaworks). 2020. *Final Report for Milwaukee, WI Area of Concern, Bathymetric Investigation.* Prepared for Anchor QEA.

Siemering, Geoffrey S. and Robert Thiboldeaux. 2020. "Background concentration, risk assessment and regulatory threshold development: Polycyclic aromatic hydrocarbons (PAH) in Milwaukee Wisconsin surface soils." *Environmental Pollution* Journal 268 (2021) 115772. October.

The Sigma Group (Sigma). 2021. *Remedial Action Options Report (Revised), Grand Trunk Wetland Parcel, 1900 South Marina Drive, Milwaukee, WI, WDNR BRRTS #02-41-530072; FID #341328240*. August.

The Sigma Group (Sigma). 2022. *Additional PCB Investigation, Sediment Sampling, and Sewer Level Monitoring, South Marina Drive Storm Sewer, Milwaukee, Wisconsin. BRRTS Number 02-41-587190 and FID Number 341331430.* December 8.

United States Army Corps of Engineers (USACE). 1992. Brochure on the International Great Lakes Datum. Accessed July 28, 2021. https://www.lre.usace.army.mil/Portals/69/docs/GreatLakesInfo/docs/IGLD/BrochureOnTheInternationalGreatLakesDatum1985.pdf.

United States Army Corps of Engineers (USACE). 2022. Presentation on behalf of the Vertical Control – Water Levels Subcommittee on the Great Lakes Basic Hydraulic and Hydrologic Data: *Updating the International Great Lakes Datum & Low Water Datum.* July 27. Accessed February 23, 2023. https://www.lre.usace.army.mil/Portals/69/docs/Navigation/FY22/Stakeholder%20Meetings/American%20Great%20Lakes%20Ports%20Association%20(AGLPA)%20Summer%202022%20Meeting%2028-JUL-22/IGLD%20LWD%20AGLPA%20Summer%20Mtg%20Brief_2022%2007.pdf?ver=CjS1FRsP5qYnpSiylXeqdQ%3D%3D

U.S. Environmental Protection Agency (EPA). 2021. Letter from EPA Great Lakes National Program Office, to Wisconsin Department of Natural Resources Office of Great Waters. September 8.

United States Geological Survey (USGS). 2022a. National Water Information System: Wen Interface, 2022. Retrieved July 2022 from United States Geological Survey. https://waterdata.usgs.gov/usa/nwis/uv?04087159

United States Geological Survey (USGS). 2022b. National Water Information System: Wen Interface, 2022. Retrieved July 2022 from United States Geological Survey. https://waterdata.usgs.gov/usa/nwis/uv?04087170

URS/Baird. 2016. *Post Remediation Assessment of Surficial Sediment Quality for the Kinnickinnic River, Wisconsin*. Prepared for U.S. Army Corps of Engineers Buffalo District. January 2016.

Wisconsin Department of Natural Resources (WDNR). 1991. *Milwaukee Estuary Stage 1 Remedial Action Plan.*

Wisconsin Department of Natural Resources (WDNR). 2003. *Wisconsin Consensus-based Sediment Quality Guidelines*. Recommendations for Use and Application, Interim Guidance RR-088. December.

Wisconsin Department of Natural Resources (WDNR). 2012. Watershed – Kinnickinnic River. Accessed March 24, 2022. https://dnr.wi.gov/water/watershedDetail.aspx?code=MI01&Name=Kinnickinnic%20River

Wisconsin Department of Natural Resources (WDNR). 2020. *Proposed Alternative for Management of Contaminated Sediment from Dredging Projects in the Milwaukee Estuary Area of Concern*. June 8.

Wisconsin Department of Natural Resources (WDNR). 2021. Website page: Watershed – Kinnickinnic River, information compiled in 2012. Accessed October 12, 2021. https://dnr.wi.gov/water/watershedDetail.aspx?code=MI01&Name=Kinnickinnic%20River#:~:text=The%20Kinnickinnic%20River%20Watershed%20is%20the%20smallest%20%2833,River%2C%20plus%20areas%20discharging%20directly%20to%20Lake%20Michigan.

Wisconsin Department of Natural Resources (WDNR). 2022a. *Remedial Action Plan Progress Summary for the Milwaukee Estuary AOC.* June. https://dnr.wisconsin.gov/topic/GreatLakes/Milwaukee.html#:~:text=The%20Remedial%20Action%20Plan%20is,important%20for%20reaching%20delisting%20targets

Wisconsin Department of Natural Resources (WDNR). 2022b. *Evaluation of Potential for Recontamination of Sediment Report*. Milwaukee Wisconsin, Milwaukee Estuary Area of Concern. May.

Tables

Table 2-1. Summary of Permitted Discharges - Kinnickinnic River Project Area

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Site Name	Site Address	Permit Type	Permit Identification	Permittee	Permit Status
Solvay Site	311 East Greenfield Avenue	Stormwater Construction	S067831	Komatsu Mining Corp Group	6 - Permit Coverage Granted
Solvay Coke Remediation	311 East Greenfield Avenue	Stormwater Construction	S067831	We Energies	6 - Permit Coverage Granted
CIMCO Resources Inc.	2929 South Chase Avenue	Stormwater - Industrial	S058831 - Storm Water Scrap Recycling	CIMCO Resources Inc.	6 - Permit Coverage Granted
Cargill Inc. Salt Division	1835 South Carferry Drive	Stormwater - Industrial	S067857 - Storm Water Industrial Tier 2 Permit	Cargill Inc. Salt Division	6 - Permit Coverage Granted
Dynamic Color Solutions, Inc.	2024 South Lenox Stret	Stormwater - Industrial	S067857 - Storm Water Industrial Tier 2 Permit	Dynamic Color Solutions, Inc	6 - Permit Coverage Granted
LJ Properties of Wisconsin, LLC	2751 South Chase Avenue	Stormwater - Industrial	S067849 - Storm Water Industrial Tier 1 Permit	LJ Properties of Wisconsin, LLC	6 - Permit Coverage Granted
Miller Compressing Company - Water Street	900 South Water Street	Stormwater - Industrial	S058831 - Storm Water Scrap Recycling	Miller Compressing Co - Water Street	6 - Permit Coverage Granted
Milwaukee Bulk Terminals Carferry	1601 South Carferry Drive	Stormwater - Industrial	S067857 - Storm Water Industrial Tier 2 Permit	Milwaukee Bulk Terminals Carferry	6 - Permit Coverage Granted
Milport Enterprises Inc.	2829 South 5th Court	Stormwater - Industrial	S067849 - Storm Water Industrial Tier 1 Permit	Milport Enterprises Inc.	6 - Permit Coverage Granted
North America Central School Bus	500 West Oklahoma Avenue	Stormwater - Industrial	S067857 - Storm Water Industrial Tier 2 Permit	North America Central School Bus	6 - Permit Coverage Granted
North American Central School Bus-Milwaukee	200 West Oklahoma Avenue	Stormwater - Industrial	S067857 - Storm Water Industrial Tier 2 Permit	North American Central School Bus	6 - Permit Coverage Granted
St. Marys Cement Inc. (United States) Badger Plant	1975 South Carferry Drive	Stormwater - Industrial	S067849 - Storm Water Industrial Tier 1 Permit	St Marys Cement Inc. (United States) Badger Plant	6 - Permit Coverage Granted
Becher Street Redevelopment	222 Becher Street	Stormwater Construction	S067831	Becher Development LLC	6 - Permit Coverage Granted
Kinder Morgan Terminal-Milwaukee Bulk Terminal	1225 Carferry Drive	Stormwater - Industrial	S067849 - Storm Water Industrial Tier 1 Permit	Kinder Morgan Terminals	6 - Permit Coverage Granted

Site Name	Site Address	Permit Type	Permit Identification	Permittee	Permit Status
Cardinal Fabricating Corporation	2021 South Lenox Avenue	Stormwater - Industrial	S067857 - Storm Water Industrial Tier 2 Permit	Cardinal Fabrication Corporation	6 - Permit Coverage Granted
Green Infrastructure at Grand Trunk Wetland	190 South Marina Drive and 632 East Bay Street	Stormwater Construction	S067831	City of Milwaukee	6 - Permit Coverage Granted
KK River Salvage and Deconstruction of Properties	Six remaining properties adjacent to the KK River between South 6th Street and South 16th Street	Stormwater Construction	S067831	Milwaukee Metropolitan Sewerage District	6 - Permit Coverage Granted

Sources:

Wisconsin Pollutant Discharge Elimination System main page - download Municipal and Industrial Permittees (accessed April 2021)

Search Construction

Search Industrial

Search Municipal

Inc. = Incorporated

KK = Kinnickinnic

LLC = Limited Liability Company

Table 2-2. Summary of Bureau of Remediation and Redevelopment Tracking System Sites - Kinnickinnic River Project Area

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Figure Identification	Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment Tracking System Number	Site Location	Site Address	Bureau for Remediation and Redevelopment Tracking Site Site Status and Type	Impacted Material	Substance Type	Contamination Type
01	341004584	KMart #4486	2701 South Chase Avenue	Closed LUST	Soil, GW	Petroleum - Unknown Type (Fuel Oil), PAHs, Lead	Petroleum, Metals
02	241461243	KMart Store 4486	2701 South Chase Avenue	Closed LUST	Soil, GW	Petroleum - Unknown Type (Fuel Oil), PAHs, Lead	Petroleum, Metals
03	241580172	East side of South Chase Avenue, 480 feet South of West Rosedale Avenue	East Side of South Chase Avenue	Open ERP	Soil, Foundry Sand	Diesel, Gasoline, VOCs	Metals, Petroleum
04	241280539	Hide House Main Property	2625 South Greeley Street	Closed ERP	Soil, GW, Vapor Intrusion	PAHs, Metals, Chlorinated Solvents, VOCs (nonpetroleum)	Petroleum, Metals, VOC
05	241554158	Hide House Building 10	2612 South Greeley Street	Closed ERP	Soil, GW	PAHs, Metals, Petroleum - Unknown Type	Petroleum, Metals
06	241554156	Hide House Lofts Phase 1	2615 South Greeley Street	Closed ERP	Soil, GW	PAHs, Metals	Petroleum, Metals
07	241554157	Hide House Lofts Phase 2	2597 South Greeley Street	Open ERP	Soil, GW	Metals, PAHs, Petroleum - Unknown Type	Metals, Petroleum
08	241548257	Vacant Property (Former Glass Manufacturing)	143 East Lincoln Avenue	Open ERP	Soil, GW	PAHs, Petroleum - Unknown Type, VOCs	Petroleum, VOC
09	341001389	Milwaukee Police Department District 2	245 West Lincoln Avenue	Closed LUST	Soil	Petroleum - Unknown Type	Petroleum
10	341250323	Vilter Manufacturing Corporation	2217 South 1st Street	Closed LUST	Soil, GW	Diesel Fuel, Gasoline - Unleaded and Leaded, Petroleum - Unknown Type	Petroleum
11	341000530	Vilter Manufacturing Corporation	2157 South 1st Street	Closed LUST	Soil, GW	Fuel Oil (heating oil), Petroleum - Unknown Type	Petroleum
12	241000978	US Industrial	2146-2156 South 4th Street	Closed ERP	Soil, GW	Arsenic, Chlorinated Solvents, PAHs	Metals, VOC, Petroleum
13	341580092	Restaurant Depot	2107 South 1st Street	Closed LUST	Soil	Chlorinated Solvents, VOCs	Petroleum, VOC
14	341003963	Edward E Gillen Company	218 West Becher	Closed LUST	Soil, GW	Gasoline - Unleaded and Leaded (Unleaded Gas), Petroleum - Unknown Type (Fuel Oil)	Petroleum
15	241559224	Edward E Gillen Company	218 West Becher	Closed ERP	Soil, GW	Chlorinated Solvents, VOCs, PAHs, Salt	VOC, Petroleum, Food
16	241581468	Becher Street Development	2011 South 1st Street	Open ERP	Soil, GW	Metals, TCE, PAHs, Lead	Metals, Petroleum, VOC
17	341000354	Watkins Trucking	2029 South 1st Street	Closed LUST	Soil, GW	Gasoline - Unleaded and Leaded, Diesel Fuel, Petroleum - Unknown Type	Petroleum
18	341585630	Becher Street Development	2011 South 1st Street	Closed LUST	Soil	Napthalene	Napthalene
19	241547838	AELCO Foundry	1930 South 4th Street	Closed ERP	Soil, GW	Arsenic, Chromium, Lead, PAHs	Metals, Petroleum
20	341003479	AELCO Foundries	1930 South 4th Street	Closed LUST	Soil	Petroleum - Unknown Type (Fuel Oil)	Petroleum
21	241184976	Tonn Property/Former BEAP Project	1906 South Third Street	Closed ERP	Soil, Vapor Intrusion	Engine Waste Oil, Metals, PAHs, PCBs, Petroleum - Unknown Type, RCRA Subtitle C Wastes, VOCs	Metals, PCB, Petroleum, RCRA, VOC
22	341112118	Vacant Parcel 1836 South 3rd Street	1836 South 3rd Street	Open LUST	Soil, GW	Arsenic, PAHs, Lead, Petroleum - Unknown Type (#6 fuel oil, Petro/Paint), VOCs	Metals, Petroleum, VOC

Figure Identification	Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment Tracking System Number	Site Location	Site Address	Bureau for Remediation and Redevelopment Tracking Site Site Status and Type	Impacted Material	Substance Type	Contamination Type
23	241261144	Parts House	215-245 West Maple Street	Closed ERP	Soil	VOCs, RCRA Metals, PAHs	Metals, Petroleum, VOC
24	241560853	Industrial/Commercial Property	1809 South 1st Street	Closed ERP	Soil, GW	PAHs, Chromium	Petroleum, Metals
25	241584105	1st Street Property	1905 South 1st Street	Open ERP	Soil, GW	Metals, PCBs, PAHs, VOCs	Metals, PCB, Petroleum, VOC
26	241111090	Kotovic Marine	1933 South 1st Street	Closed ERP	Soil, GW	PAHs, Lead, Napthalene	Petroleum, Metals, Napthalene
27	241000302	Robinsons Abandoned Boat Slip/M&I Property	1933R South 1st Street	Closed ERP	Soil	Diesel Fuel	Petroleum
28	241109522	M&I Property	1933R South 1st Street	Closed ERP	Soil	Diesel, Arsenic, VOCs	Petroleum, Metals, VOC
29	241544664	Lincoln Warehouse	2018 South 1st Street	Closed ERP	Soil, GW	Arsenic, Chromium, Lead, Mercury, Petroleum - Unknown Type	Metals, Petroleum
30	241583644	Commercial Heat Treating (Former)	1958 South 1st Street	Open ERP	Soil, GW	Cyanide, PAHs, PCBs, Petroleum - Unknown Type, TCE, VOCs (Tetrachloroethylene, other chlorinated solvents)	Industrial Chem, PCB, Petroleum, VOC
31	341101172	Tru Cut Abrasives	1820-1838 South 1st Street	Closed LUST	Soil	Diesel Fuel (1,000 gallons)	Petroleum
32	241001143	Milwaukee City KK Bridge	1900 Block South Kinnickinnic Avenue	Closed ERP	Sediment	Metals, RCRA Subtitle C Wastes, VOCs, Gasoline - Unleaded and Leaded, Diesel Fuel, Petroleum - Unkown Type, Engine Waste Oil	Metals, RCRA, VOC, Petroleum
33	241460770	KK Auto Salvage South	2003 South Kinnickinnic Avenue	Open ERP	No documentation is available in the BRRTS database that specifies the impacted materials. Soil sampling was requested by the WDNR but it is unclear if it was carried out by the responsible party.	Petroleum - Unknown Type, Unknown Substance, VOCs	Petroleum, Unknown, VOC
34	241562341	The Merchandisers Incorporated - 339 East Stewart Street	339 East Stewart Street	Closed ERP	Soil, GW	PAHs	Petroleum
35	241427282	1977 S Allis Street Complex	1977 South Allis Street	Closed ERP	Soil, GW	Arsenic, Chromium, Petroleum - Unknown Type, PAHs, Lead	Metals, Petroleum
36	341005230	Skipper Buds	1919 South Marina Drive	Closed LUST	Soil, GW	Gasoline - Unleaded and Leaded (4,000 gallons)	Petroleum
37	241587190	South Marina Drive Storm Sewer	South Marina Drive Storm Sewer	Open ERP	Sediment	PCBs	PCB
38	341100727	Grand Trunk Southwest Parcel	1950 South Marina Drive	Closed LUST	Soil, GW	Gasoline - Unleaded and Leaded (1,000 gallons)	Petroleum
39	241588233	Grand Trunk Southwest Parcel	1950 South Marina Drive	Open ERP	Soil, GW, SW	Arsenic, Chromium, Cyanide, Mercury, Metals, PAHs, Lead, Petroleum - Unknown Type, VOCs, Other Substance Not Listed	Industrial Chemical, Metals Other, Petroleum, VOC
40	241530072	Grand Trunk Wetland Restoration Parcel	1900 South Marina Drive	Open ERP	Soil, GW, SW	Arsenic, Chromium, PAHs, Lead, Petroleum - Unknown Type, VOCs	Metals, Petroleum, VOC
41	241561744	Grand Trunk North Parcel	1800 South Marina Drive	Open ERP	Soil, GW	Metals, PAHs, Petroleum - Unknown Type, VOCs	Metals, Petroleum, VOC
42	241226464	Continental Grain Company	960 East Bay Street	Open ERP	Soil, GW	Chlorinated Solvents, PAHs	VOC, Petroleum

Figure Identification	Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment Tracking System Number	Site Location	Site Address	Bureau for Remediation and Redevelopment Tracking Site Site Status and Type	Impacted Material	Substance Type	Contamination Type
43	241563513	Diversified Machine (Former)	2039 South Lenox Street	Closed ERP	Soil, GW	Benzene, TCE, Diesel, Metals	VOC, Petroleum, Metals
44	341004403	Wrought Washer Manufacturing	2100 South Bay Street	Closed LUST	Soil, GW	Fuel Oil, Petroleum - Unknown Type (Kerosene)	Petroleum
45	341000749	Ruan Leasing Company	1050 East Bay Street	Closed LUST	Soil, GW	Gasoline - Unleaded and Leaded	Petroleum
46	341000752	Miller Compressing Company	1000 East Bay Street	Closed ERP	Soil	Diesel, Arsenic	Petroleum, Metals
47	241256718	Miller Compressing Company	1000 East Bay Street	Closed ERP	Soil, GW	Cutting and lubricating fluids, Napthalene, PAHs, PCBs, Lead	Other, Petroleum, PCB, Metals
48	241585627	Kinnickinnic River	Kinnickinnic River Area of Concern	Open ERP	Sediment	Metals, PAHs, PCBs	Metals, Petroleum, PCB
49	241587624	Solvay Car Ferry Slip	311 East Greenfield Avenue	Open ERP	Soil, GW, SW, Sediment	PAHs	Petroleum
50	241466662	Milwaukee Solvay Coke and Gas - Manufacturing Gas Plant (Alternative Superfund)	311 East Greenfield Avenue	Open ERP	Soil, GW, SW, Sediment	Chromium, Cyanide, Mercury, Non-Chlorinated Solvents, PAHs, Lead, Petroleum - Unknown Type, VOCs	Industrial Chemical, Metals, Petroleum, VOC
51	241582221	Vacant Property - City of Milwaukee	401 East Greenfield Avenue	Open ERP	Soil, GW, Vapor Intrusion	Metals, PAHs, VOCs	Metals, Petroleum, VOC
52	341100079	Port of Milwaukee - Former Duchow Yacht Company	1431 South Carferry Drive	Closed LUST	Soil	PAHs	Petroleum
53	241100075	Port of Milwaukee - Former Duchow Yacht Company	1431 South Carferry Drive	Closed ERP	Soil, GW	PAHs	Petroleum
54	341000136	Milwaukee City Department of Public Works	1200 South Lincoln Memorial Drive	Closed LUST	Soil, GW, SW	Diesel Fuel, PAHs	Petroleum
55	241560309	Great Lakes Water Institute	600 East Greenfield Avenue	Open ERP	Soil	Diesel Fuel	Petroleum
56	241000854	WEPCO/Construction Resources #2	301 East Washington Street	Open ERP	Soil	Petroleum - Unknown Type	Petroleum
57	241000524	Construction Resources Management #1	301 East Washington Street	Closed ERP	Soil, GW, SW	Metals, RCRA Subtitle C Wastes	Metals, RCRA
58	241000321	Miller Compressing	900 South Water Street	Closed ERP	Nonimpervious Concrete	PCBs	PCB
59	241000468	Milwaukee City Department of City Development Florida Yards	317 East National Avenue	Closed ERP	Soil	Metals, RCRA Subtitle C Wastes, PAHs, VOCs	Metals, RCRA, Petroleum, VOC
60	241363105	V Marchese Former Florida Yards Lot 3	600 South Jake Marchese Way	Open ERP	Soil	PAHs, Petroleum - Unknown Type, VOCs	Petroleum, VOC
61	241582362	Union Pacific Railroad	4823 North 119th Street	Open ERP	Soil, GW	Arsenic, Metals, Other Substance Not Listed, TCE, PAHs, Lead, PCBs, VOCs	PCB, Petroleum, Metals, Other, VOC
62	241554866	Harbor Distribution Substation - Former Lann	639 South Water Street	Open ERP	Soil, GW, Vapor Intrusion	Chlorinated Solvents, Mineral Oil, Lead, PCBs, PAHs, Petroleum - Unknown Type, VOCs	Metals, Mineral Oil, PCB, Petroleum, VOC
63	341004425	Duchows Harbor Marine	700 South Water Street	Closed LUST	Soil, GW	Gasoline - Unleaded and Leaded (Leaded Gas), Diesel Fuel	Petroleum

Figure Identification	Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment Tracking System Number	Site Location	Site Address	Bureau for Remediation and Redevelopment Tracking Site Site Status and Type	Impacted Material	Substance Type	Contamination Type
64	241261290	Barrel Plating Service	435-503 South Water Street	Closed ERP	Soil, GW, Vapor Intrusion	PAHs, VOCs, Metals, PCBs, Cyanide, TCE, Chlorinated Solvents, Petroleum - Unknown Type, Lead	Petroleum, VOC, Metals, PCB, Industrial Chemical
65	241000337	Milwaukee City Sewer Project	600 South Water Street	Closed ERP	Soil	Petroleum - Unknown Type	Petroleum
66	241547718	City of Milwaukee, Erie Street Plaza	665 East Erie Street	Closed ERP	Soil, Vapor Intrusion	PAHs, Lead, Chlorinated Solvents	Petroleum, Metals, VOC
67	241560893	City of Milwaukee Parking Lot	642 East Erie Street	Closed ERP	Soil	Lead, PAHs, Chlorinated Solvents	Metals, Petroleum, VOC
68	241585337	Milwaukee Area of Concern Special PFAS Study	Milwaukee Estuary	Open ERP	Sediment	PFAS	Industrial Chemical
69	241001137	Former Louis Allis Property	427 East Stewart Street	Open ERP	Soil, GW, building materials	PCBs, metals, VOCs	Industrial Chemical

Source: Wisconsin Department of Natural Resources (WDNR). 2022. Brownfields: Redevelopment Opportunities. RR Site Maps. Accessed April and December 2022.

BRRTS = Bureau for Remediation and Redevelopment Tracking System
ERP = Environmental Remediation Project
GW = Groundwater
KK = Kinnickinnic
LUST = Leaking Underground Storage Tank
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
PFAS = per- and polyfluoroalkyl substances
RCRA = Resource Conservation and Recovery Act
SW = Surface Water
TCE = Trichloroethylene
VOC = Volatile Organic Compounds
WDNR = Department of Natural Resources

Table 3-1. Estimated Remedial Alternative Quantities - Kinnickinnic River Project Reach

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Remedial Alternative	Quantity Subcategories	Modeled Volume[a] (cubic yards)	Removal Volume[b] (cubic yards)	Non-Removal Volume[c] (cubic yards)
Alternative 2	non TSCA	1,080,000	699,000	381,000
PCBs >1 mg/kg, or metals	TSCA[d]	5,100	4,500	600
(Cr, Pb, Hg), or PAHs >PEC	**Alternative 2 Total**	**1,085,100**	**703,500**	**381,600**
Alternative 3	non TSCA	613,000	387,000	226,000
PCBs >1 mg/kg, or metals	TSCA[d]	5,100	4,500	600
(Cr, Pb, Hg) or PAHs >3xPEC	**Alternative 3 Total**	**618,100**	**391,500**	**226,600**
Alternative 3A	non TSCA	613,000	276,500	336,500
PCBs >1 mg/kg, or metals	TSCA[d]	5,100	4,500	600
(Cr, Pb, Hg) or PAHs >3xPEC	**Alternative 3A Total**	**618,100**	**281,000**	**337,100**
Alternative 4	non TSCA	589,000	353,000	236,000
PCBs >3 mg/kg, or metals	TSCA[d]	5,100	4,500	600
(Cr, Pb, Hg) or PAHs >3xPEC	**Alternative 4 Total**	**594,100**	**357,500**	**236,600**
Grand Trunk Wetland	non TSCA	--	53,700	--
Preferred Remedial Action Option Number 2[e]	TSCA[d]	--	0	--
	Grand Trunk Wetland Total	**--**	**53,700**	**--**

Sources:

Sigma. 2021. *Remedial Action Options Report.*

Wisconsin Department of Natural Resources (WDNR). 2003. *Wisconsin Consensus-based Sediment Quality Guidelines. Recommendations for Use and Application, Interim Guidance RR-088.* December.

[a] Environmental Visualization System modeled volume greater than remedial action level concentrations including overburden and 0.5 foot of overdredge allowance.

[b] Volumes represent the estimated quantity of target remediation that is accessible for removal through dredging and/or excavation. The portion of removal volume associated with the Turning Basin as follows: for each Alternative 2 = 278,000; Alternative 3 = 209,000; Alternative 3A = 129,000; Alternative 4: 185,000

[c] Estimated quantity of target remediation volume not readily accessible for removal due to shoreline and utility offsets and associated 3:1 sideslope.

[d] The volume reported for TSCA-impacted sediment represents removal of TSCA material through the implementation of temporary shoreline stabilization during removal.

[e] Grand Trunk Wetland Parcel removal volume was obtained from preferred Remedial Action Option 2 in the *Remedial Action Options Report* (Sigma 2021).

> = greater than
3x = three times
AOC = Area of Concern
Cr = chromium
EVS = Environmental Visualization System
Hg = mercury
mg/kg = milligram(s) per kilogram
PAH = polycyclic aromatic hydrocarbon
Pb = lead
PCB = polychlorinated biphenyl
PEC = Probable Effect Concentration for Cr, Hg, PAHs from WDNR 2003.
TSCA = Toxic Substance Control Act

Table 4-1. Remedial Technologies Screening Summary – Kinnickinnic River Project Area

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Remedial Technologies	Process Options	Description	Screening Criterion Effectiveness	Screening Criterion Implementability	Screening Criterion Relative Cost	Screening Comment
No Action	None	No further actions to address contaminated sediment.	Some natural recovery may occur as contaminants of concern (COCs) slowly biodegrade over time and/or are covered by clean sediment; however, no monitoring would be performed to assess these changes. If implemented alone does not meet the remedial action objectives (RAOs) for the project.	Not applicable.	None	Required for comparison.
Natural Recovery	Monitored Natural Recovery	Allow naturally occurring physical, chemical, and biological processes to reduce the bioavailability and/or toxicity of COCs to acceptable levels. Burial of contaminated sediment by cleaner sediment is occurring given the lower surface and near surface COC concentrations compared to concentrations in subsurface sediment and quiescent conditions conducive to deposition of suspended sediment.	Some natural recovery may occur as COCs slowly biodegrade over time. The Kinnickinnic (KK) River Project Area appears to be a net depositional area, where contaminated subsurface sediment is buried by cleaner sediment. The conceptual site model indicates that recontamination potential is low.	Easily implementable if monitoring is administratively feasible. Requires additional data collection and interpretation to estimate net sedimentation rates within the KK River. Will also require institutional controls.	Low	Not retained for further evaluation because there is currently no mechanism for funding the monitoring component.
Sediment Removal	Dredging	Dredging removes sediment either through hydraulic or mechanical methods. The dredge location and elevation are controlled by global positioning system-integrated software for real-time positioning. Hydraulic dredging removes sediment with hydraulic suction to a specified dredge-cut elevation. Common hydraulic dredges include cutterhead, plain suction, pneumatic submersible pumps, and diver-assisted hand-held hydraulic suctions. Sediment is then pumped through a pipeline to a staging area or disposal site for dewatering and processing. Mechanical dredging uses a clamshell bucket operated from a crane or excavator on a floating barge or the shoreline to remove the sediment to a specified dredge-cut elevation. Dredged sediment is typically placed in barges for transport to a staging area or disposal site.	Effective. Contaminated sediment is removed from the river, eliminating the direct contact human exposure and the fish/benthic community exposure pathways. Suspended solids that are released during the dredging activities can be minimized using engineering controls. May disrupt the fish/benthic community initially but provides a cleaner sediment surface for recolonization.	Implementable. Requires permits. Limitations may include removal of sediment adjacent to shorelines and other in-water structures, which may require the addition of shoreline stabilization or reinforcement before, during, or following dredging activities, and low clearance for bridge crossings. For hydraulic dredging, constant monitoring of the pipeline for leaks and water treatment for a relatively large volume of water from the dredged sediment are needed. The dredged sediment can be readily transported through a pipeline to the dredged materials management facility (DMMF) with limited impacts to waterway traffic and therefore requires less coordination with waterway users. This option typically generates fewer sediment residuals than mechanical dredge methods and may not require active turbidity control (e.g., silt curtains). The presence of debris can severely reduce production rate. The depth of water influences the size of hydraulic dredge and its efficiency during dredging operations. For mechanical dredging, barge transport of dredged sediment is limited by various obstructions around bridges and would affect waterway traffic and require more coordination with the waterway users. Debris has a relatively smaller impact on production rate for mechanical dredging than for hydraulic dredging. It typically generates more sediment residuals than hydraulic dredging and requires implementation of mechanical dredge best management practices (BMPs) and active turbidity control (e.g., silt curtains). Generates a relatively small volume of water to be treated.	Moderate to High	Dredging is retained for further evaluation in conjunction with sediment disposal technologies. Hydraulic dredging is expected to be more efficient and cost effective than mechanical dredging in the KK River because of the complexities associated with barge transport under numerous bridge crossings with low clearances in waterways with multiple users, leading to longer project duration and higher costs. Mechanical dredging may be used in some circumstances such as removal of Toxic Substance Control Act (TSCA)-level sediment, debris, or sediment that cannot be accessed with a hydraulic dredge.

Remedial Technologies	Process Options	Description	Screening Criterion Effectiveness	Screening Criterion Implementability	Screening Criterion Relative Cost	Screening Comment
Residuals Management	Residual Management Cover	After sediment removal, a 6-inch cover layer of clean sand is placed over the residual material to reduce the COC concentrations to which biota are exposed. This clean cover layer is not a cap because it is expected to mix with the dredge residuals rather than to isolate the underlying sediment. Placement of a cover layer can effectively reduce the residual COC concentrations in areas where sufficient COC mass has been removed.	Can effectively reduce the residual COC concentrations in areas where sediment has been removed. However, may require additional dredging to enable clean layer placement to be below the authorized depth of the federal navigational channel (FNC) and operational depth requirements in the Turning Basin. Provides cleaner surface for the biota, facilitating replenishment of the benthic community.	Easily implementable. Needs verification to confirm that the required thickness of clean cover material is placed. Insufficient material may be ineffective.	Low to Moderate	Retained for further evaluation in conjunction with sediment removal technologies.
Sediment Disposal	Offsite Disposal – DMMF	The DMMF planned for the Milwaukee Estuary Area of Concern (AOC) is an in-water facility designed for containment of contaminated dredged sediment that provides control of potential releases of COCs to the environment. Dredged sediment is placed directly into the DMMF for disposal prior to dewatering.	Effective. The engineering controls implemented in the DMMF provide control of potential releases of COCs to the environment. Verification of engineering controls may be required to confirm containment of COCs.	Implementable, but requires permitting through the U.S. Army Corps of Engineers (USACE). It is assumed that TSCA-level or non-aqueous phase liquid (NAPL)-impacted sediment will not be allowed for disposal in the DMMF. Available capacity in the proposed DMMF and removal volumes from multiple project areas within the AOC need further evaluation.	Low to Moderate. Expected to be less expensive than offsite disposal, due to savings on stabilization, transportation, and disposal fees.	Currently retained for further evaluation. The proposed DMMF is currently in the design phase. Requires close coordination with the U.S. Environmental Protection Agency, Wisconsin Department of Natural Resources (WDNR), USACE, and Port of Milwaukee, and requires federal and non-federal sponsors. Volume of sediment to be removed from the AOC collectively is currently being evaluated.
Sediment Disposal	Offsite Disposal – Subtitle C or Subtitle D Landfill	Disposal of dewatered sediment at an offsite facility. Characterization data collected to date in the KK River demonstrate that sediment is non-hazardous under the Resource Conservation and Recovery Act (RCRA). Some of the sediment within the KK River Project Area has polychlorinated biphenyl (PCB) concentrations greater than the 50 milligrams per kilogram (mg/kg) TSCA threshold, which would require disposal in a Subtitle C landfill PCBs exceed the TSCA threshold of 50 mg/kg PCBs in two areas: (1) within the Grand Trunk Slip, and (2) a small area (estimated to be 170 square feet) in Reach 1 downstream of the Lincoln Avenue Bridge .	Effective. Would permanently remove COC mass from the project site.	Local landfills within the project vicinity are approved for special waste disposal of sediment with less than 50 mg/kg PCBs and non-hazardous waste levels of other COCs. The acceptability of the sediment by the offsite disposal facility would need to be evaluated in greater detail during remedial design; disposal requirements for emerging contaminants are uncertain. Sediment with concentrations greater than 50 mg/kg PCBs are expected to be disposed in a Subtitle C landfill or equivalent. The exact disposal facility and requirements would need to be evaluated in greater detail during remedial design.	Moderate	Retained for further evaluation specific to handling TSCA-level sediment, which would be removed to an upland dewatering area for eventual offsite disposal in an approved landfill.
Sediment Dewatering	Dewatering: DMMF Disposal	Pumping of dredged sediment at a low solids concentration directly to the DMMF. The sediment is passively dewatered by settling of solids and evaporation of overlying water. Remaining free water on top is treated and discharged to Lake Michigan under a Wisconsin Pollutant Discharge Elimination System permit. Requires an onsite wastewater plant of sufficient capacity to allow for continuous dredging operations and prevent accumulation of large quantities of water in the DMMF.	Sediment slurry is pumped as a controlled flow from the hydraulic dredge to the DMMF facility through submerged pipes that do not interfere with waterway traffic. Dependent on the discharge criteria and the efficiency of the treatment processes. Removes COCs and turbidity before discharging into Lake Michigan. An effluent monitoring system is required to monitor the discharge concentrations.	Easily implementable and cost effective. Extended dewatering duration and effective water treatment system are essential for uninterrupted dredging operations. Water treatment for a relatively large volume of water from the dredged sediment needed. Typically requires treatability testing to select reagent and mix to improve sediment dewatering and for design of water treatment system.	Moderate to High	Retained for further evaluation as hydraulic dredging and pipeline transport to the DMMF is likely to be used on an AOC-wide basis.
Sediment Dewatering	Dewatering: Upland Management and Disposal	Excess free water generated from mechanical removal of sediment is pumped from watertight scow barges to a storage tank, then treated and discharged. Dredged sediment is then offloaded to a staging pad where it dewaters by gravity drainage and stabilized as needed for transport and upland disposal. Water is then physically and chemically treated to remove suspended solids and COCs before being discharged back into the river or to the publicly owned treatment works (dependent on permitting).	Dependent on the discharge criteria and the efficiency of the water treatment processes. An effluent monitoring system is required to monitor the discharge concentrations.	Limited by availability of upland staging areas for equipment and drying and transloading of sediment.	Moderate to High	Retained for further evaluation as offsite landfill disposal may be used in some circumstances such as removal of TSCA-level sediment.

Remedial Technologies	Process Options	Description	Screening Criterion Effectiveness	Screening Criterion Implementability	Screening Criterion Relative Cost	Screening Comment
Sediment Containment	Cap	Place one or more layers of clean material over the surface of contaminated sediment to isolate the sediment left in place and reduce COC flux to the environment. A cap could be constructed in areas along the shoreline where sediment cannot be removed due to stability concerns, or in other areas that cannot be accessed for dredging. Amendments that enhance sequestration or degradation of COCs could be added to the cap if needed to inhibit COC migration. Provides long-term risk reduction to human and ecological receptors.	Can be effective if cap remains in place. Isolates the COCs from human and ecological receptors and prevents resuspension of contaminated sediment. Regular cap inspection and maintenance are required to address eroded or disturbed areas. The cap dimensions and materials need to be carefully designed to avoid head cutting and scouring effects. May provide habitat for benthic organisms and fish species pending cap materials used. Treatability testing may be needed to support design of an active (amended) cap, which would reduce contaminant flux by increasing sorptive capacity and/or by enhancing degradation. Long-term effectiveness is dependent on cap thickness, material selection, and maintenance.	Installation implementable for areas with PCB concentrations below TSCA levels. Installation within the FNC requires the cap surface to be 3 feet below the authorized FNC elevation. Requires permits. May disrupt the existing dock areas and waterway users. Will require long-term monitoring and institutional controls. Requires staging areas for cap material close to the remediation location. Cap extents must be mapped and reported in applicable WDNR databases. Most materials and equipment are readily available. Slower construction may be necessary for active caps to reduce placement variability of layers containing reactive materials.	Low to Moderate. Long-term costs include periodic monitoring of the cap and cap maintenance as required. Costs for active capping would be moderate to high.	Retained for further evaluation for areas where dredging is not implementable and PCB concentrations are below TSCA levels. There may be challenges to implementability due to low clearance near bridges, preventing use of mechanical equipment needed for the installation.
Sediment Containment	Sand Cover	Placement of a sand layer to reduce COC concentrations in surface sediment and help isolate underlying sediment.	Effective if sand cover remains in place or is mixed with underlying sediment. Effectiveness is enhanced by natural sediment deposition and accumulation. Reduces exposure to COCs and reduces resuspension of contaminated sediment. Provides habitat for benthic organisms depending on materials used. Long-term effectiveness is dependent on cover thickness, type, and ability to remain in place.	Implementable except within the FNC for sediment shallower than the authorized elevation. Availability of a sufficient volume of sand cover material may be a constraint. Needs verification to confirm that the required thickness of clean cover material is placed. Requires staging areas for cover material close to the remediation location. Most materials and equipment are readily available. Does not require institutional controls, monitoring, or maintenance.	Low to moderate	Retained for further evaluation for areas where dredging and capping are not implementable or cost-effective.
In Situ Treatment	Activated Carbon	This technology involves mixing activated carbon (e.g., granular activated carbon, SediMite, or other amendment) into surficial sediment to adsorb hydrophobic organic contaminants and reduce contaminant bioavailability. Carbon amendments can be mixed into the sediment using mechanical methods or natural biological activity (bioturbation).	Effective for reducing bioavailability of hydrophobic organic contaminants but may not be effective for metals. Long-term effectiveness and permanence are uncertain.	Implementable in areas with PCB concentrations below TSCA levels outside of the FNC or if the FNC is deauthorized. Amendments can be placed using conventional equipment. Can be used to treat areas under bridges or against bulkheads where other technologies would be difficult to implement. Would require staging areas for stockpiling materials. May require additional institutional controls and long-term monitoring.	Moderate to high depending on area to be treated.	Not retained for further evaluation. Long-term effectiveness and permanence are uncertain and long-term monitoring and maintenance would be needed.
In Situ Treatment	Fixation/ Stabilization	Involves applying or mixing of an amendment into sediment through mechanical means (using augers, for instance) to immobilize COCs by physically binding or enclosing the sediment within a stabilized mass or chemically treating these to become immobile.	In situ treatment technologies can achieve immediate risk reduction by reducing the bioavailability and mobility of a range of organic and metal COCs in environmentally sensitive environments or in areas where sediment removal or capping are not implementable.	Implementable with limitations. Requires permits. Can be implemented at discrete depth intervals to target a specific layer of impacted sediment. May allow for management of contaminated sediment adjacent to retaining and support structures, which are often aged and require structural analysis and support prior to dredging or removal activities. Requires bench-scale testing for selecting the suitable stabilization/ solidification amendment. May require a protective surface structure (such as rip rap or articulated mat) depending on the strength of treated sediment and erosional forces present. Requires staging area for the storage and preparation of stabilization/solidification amendment.	Moderate to High	Retained for further evaluation. Implementing in situ stabilization measures in areas with low clearance may be complex. Stabilization measures require erosion protection, long term monitoring and cannot be implemented if the FNC is not deauthorized. May be considered for application near bulkheads to protect shoreline stability.

Remedial Technologies	Process Options	Description	Screening Criterion Effectiveness	Screening Criterion Implementability	Screening Criterion Relative Cost	Screening Comment
Ex Situ Treatment	Sediment Stabilization/ Solidification	Dewatered sediment is mixed with an additive (fly ash, Portland cement) to decrease the leachability of COCs and meet transportation and disposal requirements.	Effective as a secondary dewatering technology for sediment following passive dewatering techniques. Can improve the chemical and physical properties of the sediment for disposal.	Requires mixing amendments into the sediment following excavation and passive dewatering prior to disposal. Typically requires pilot testing for selecting the suitable stabilization/solidification amendment. After stabilization/solidification, sediment will be loaded into trucks for offsite disposal.	Moderate	Retained for further consideration for dredged material to be transported to an upland disposal facility (including TSCA-level sediment).
Ex Situ Treatment	Particle Size Segregation and Washing	Vibrating or fixed screens, hydrocyclones, or gravity separation used to segregate particle sizes in sediment allowing separate disposal of fine-grained material with higher COC concentrations.	Effective. Can be a good source of fill materials for beneficial reuse if sufficient quantity of sand and/or gravel exists within sediment to be removed.	Easily implemented along with hydraulic dredging. Requires staging area for implementation. The quantity of sand and/or gravel that exists within the dredged sediment to be evaluated for cost effectiveness. Pilot/bench-scale testing is required.	Moderate	Retained for further evaluation to reduce the volume of material requiring disposal in DMMF. Minimizing the amount of waste requiring disposal in the DMMF can decrease the amount of space consumed and facilitates the effective management of contaminated sediment from other project areas in AOC.
Ex Situ Treatment	Sediment Washing	PCBs sorbed onto fine soil particles are separated from bulk soil in an aqueous-based system based on particle size. Wash water may be augmented with a basic leaching agent, surfactant, pH adjustment, or chelating agent to help remove organics.	Considered a transfer technology in that the COCs are not destroyed but transferred to another media. Consequently, the resulting concentrated sediment must be disposed of appropriately. Varying concentrations and mix of COCs at the site create a complex washing solution.	Requires sediment excavation, pilot/bench scale testing. Equipment and utility requirements are substantial.	High	Not retained for further evaluation due to implementability and cost concerns.

AOC = area of concern
BMP = best management practice
COC = contaminant of concern
DMMF = dredged materials management facility
FNC = federal navigation channel
KK = Kinnickinnic
mg/kg = milligram(s) per kilogram
NAPL = non-aqueous phase liquid
PCB = polychlorinated biphenyl
RAO = Remedial Action Objective
RCRA = Resource Conservation and Recovery Act
TSCA = Toxic Substance Control Act
USACE = U.S. Army Corps of Engineers
WDNR = Wisconsin Department of Natural Resources

Table 5-1. Conceptual Alternatives Summary - Kinnickinnic River Project Area

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Element No.	Conceptual Alternative Element	Alternative 1 No Action	Alternative 2 Total PCBs >1 mg/kg, or metals (Cr, Pb, Hg) or Total PAHs >PEC	Alternative 3 Total PCBs >1 mg/kg, or metals (Cr, Pb, Hg) or Total PAHs >3xPEC	Alternative 3A Total PCBs >1 mg/kg, or metals (Cr, Pb, Hg) or Total PAHs >3xPEC	Alternative 4 Total PCBs >3 mg/kg, or metals (Cr, Pb, Hg) or Total PAHs >3xPEC
1	**Remedial Target Area** - Area (acres)	Not applicable	90	56	56	54
	Remedial Target Area - Removal Volume (cubic yards)[a]	Not applicable	703,500	391,500	281,000	357,500
2	**Non-TSCA Sediment Removal** - Non-TSCA Removal Area (acres)	Not applicable	79	42	42	38
	Non-TSCA Sediment Removal - Portion of Hydraulic Removal Volume (cubic yards)	Not applicable	434,000	243,200	241,500	225,100
	Non-TSCA Sediment Removal - Portion of Mechanical Removal Volume (cubic yards)	Not applicable	265,000	143,800	35,000	127,900
	Non-TSCA Sediment Removal - Estimated Dewatered (Supernatant) Volume for Treatment[b] (gallons)	Not applicable	1,260,000,000	700,000,000	500,000,000	640,000,000
3	**TSCA Sediment Removal**[c] - TSCA Removal Area (acres)	Not applicable	1	1	1	1
	TSCA Sediment Removal[c] - Portion of Mechanical Removal Volume (cubic yards)	Not applicable	4,500	4,500	4,500	4,500
	TSCA Sediment Removal[c] - Shoreline and Utility Corridor Reinforcement (linear feet)	Not applicable	1,100	1,100	1,100	1,100
	TSCA Sediment Removal[c] - Estimated Dewatered (Supernatant) Volume for Treatment[d] (gallons)	Not applicable	270,000	270,000	270,000	270,000
4	**Cap/Cover** - Cap Area (acres)	Not applicable	31	19	15	18
	Cap/Cover - Capping Material Volume (cubic yards)	Not applicable	92,000	58,000	47,000	55,000
	Cap/Cover - Sand Cover Area (acres)	Not applicable	Not applicable	Not applicable	19	Not applicable
	Cap/Cover - Sand Cover Material Volume (cubic yards)	Not applicable	Not applicable	Not applicable	54,000	Not applicable
5	**Residual Management Cover** - Area (acres)	Not applicable	59	37	22	36
	Residual Management Cover - Residual Cover Material Volume (cubic yards)	Not applicable	71,000	45,000	27,000	44,000

Source: *Wisconsin Department of Natural Resources (WDNR). 2003. Wisconsin Consensus-based Sediment Quality Guidelines. Recommendations for Use and Application, Interim Guidance RR-088*. December.

[a] Estimated quantity of target remediation volume accessible for removal through dredging and/or excavation.

[b] Includes pipeline transport to DMMF with dewatering and supernatant treatment at DMMF location, treated with temporary onsite water treatment plant and discharged to the river under WPDES discharge permit.

[c] The volume reported for TSCA-impacted sediment represents full removal of TSCA material through the implementation of temporary shoreline stabilization during removal.

[d] Includes staging, dewatering, solidification at upland staging area with offsite transport of sediment to Subtitle C or D landfill; excess water collected, treated with temporary onsite water treatment plant and discharged to the river under WPDES discharge permit.

> = greater than
3x = 3 times
Cr = chromium
DMMF = dredged materials management facility
Hg = mercury
mg/kg = milligram(s) per kilogram
PAH = polycyclic aromatic hydrocarbon
Pb = lead
PCB = polychlorinated biphenyl
PEC = Probable Effect Concentration (per WDNR 2003)
TSCA = Toxic Substance Control Act
WPDES = Wisconsin Pollutant Discharge Elimination System

Table 6-1. Remedial Alternative Evaluation Summary – Kinnickinnic River Project Area

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Criterion	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 3A	Alternative 4
1. Threshold Criterion Compliance with applicable federal, state, and local regulations	No remedial action; therefore, not applicable.	Multiple permits would be required (see Appendix C). The Alternative can be designed to comply with applicable regulations.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
2(a). Balancing Criterion: Long-Term Effectiveness Ability to achieve remedial action objectives (RAOs) and contribute to beneficial use impairment (BUI) removal; amount of residual contamination [a] anticipated to be left in place; adequacy and reliability of long-term controls; potential for recontamination; expected performance in response to extreme storm events and climate change.	RAOs not likely to be met within a reasonable timeframe. Would not contribute to removal of BUIs.	Sediment removal and the residual cover layer reliably and permanently reduce the mass, volume, and concentrations of contaminants of concern (COCs) in sediment, thereby reducing exposure and risk to ecological and human receptors and contributing to the removal of BUIs. Capping contaminated sediments that cannot be cost-effectively removed eliminates exposure and risk by isolating contaminants in the undredged inventory. Disposal of contaminated sediment in the dredged materials management facility (DMMF) or in a permitted offsite landfill eliminates all exposure pathways. Alternative 2 would be implemented to maintain depth requirements in the federal navigation channel (FNC). Alternative 2 has the greatest long-term effectiveness because the largest area (90 acres) is covered with a cap or residual cover layer compared to Alternatives 3, 3A, and 4, and the lowest concentrations of COCs remain in place. As discussed in Section 2.7, recontamination potential from other sources is also low. Alternative 2 can be designed to withstand extreme storm events and be resilient in response to climate change.	Alternative 3 uses the same approaches to achieve RAOs and contribute to BUI removal as Alternative 2. However, Alternative 3 has less long-term effectiveness than Alternative 2 because a smaller remediation target area (RTA) (56 acres) would be covered with a cap or residual cover layer following dredging, and sediment with higher metals (chromium, lead, mercury) and polycyclic aromatic hydrocarbon (PAH) concentrations would remain in place compared to Alternative 2. The long-term impact of removing less sediment on achieving BUIs compared to Alternative 2 is uncertain because a combination of actions (including sediment remediation) will contribute to BUI removal, and natural deposition of relatively cleaner sediment is expected to occur after the sediment remedial action is complete.	Alternative 3A uses the same approaches to achieve RAOs and contribute to BUI removal as Alternatives 2 and 3. Although the RTAs for Alternatives 3 and 3A are identical (56 acres), a maximum dredge elevation would be used and deeper sediment with COC concentrations exceeding cleanup goals (CUGs) would remain in place beneath a cap (Reaches 1 -4) or sand cover (Turning Basin). The long-term effectiveness of caps and sand cover, particularly in the Turning Basin, is less certain compared to dredging. The effectiveness of sand cover in the Turning Basin will be further evaluated during the remedial design with a focus on maximizing long-term effectiveness of the remedy in accordance with current and future Port operations. The long-term impact of removing less sediment on achieving BUIs compared to Alternative 2 is uncertain because a combination of actions (including sediment remediation) will contribute to BUI removal, and natural deposition of relatively cleaner sediment is expected to occur after the sediment remedial action is complete.	Alternative 4 uses the same approaches to achieve RAOs and contribute to BUI removal as Alternatives 2 and 3. However, Alternative 4 has less long-term effectiveness than the other alternatives because a smaller area (54 acres) would be covered with a cap or residual cover layer following dredging, sediment with higher polychlorinated biphenyl (PCB) concentrations would remain in place compared to Alternatives 2, 3, and 3A; and sediment with higher metals (chromium, lead, mercury) and PAH concentrations would remain in place compared to Alternative 2. The long-term impact of removing less sediment on achieving BUIs compared to Alternatives 2 and 3 is uncertain because a combination of actions (including sediment remediation) will contribute to BUI removal, and natural deposition of relatively cleaner sediment is expected to occur after the sediment remedial action is complete.

Criterion	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 3A	Alternative 4
2(a). Balancing Criterion: Short-Term Effectiveness Potential adverse impacts on public health, safety, welfare, and the environment during construction and implementation; protection of the community during remedial action, environmental impacts of the remedial action, and time until RAOs are achieved.	No remedial action; therefore, not applicable.	(Estimated in-water remedial action time = 9 months). Potential adverse impacts on public health, safety, welfare, and the environment during construction and implementation include the following: ▪ Reduced public access to the river and shoreline ▪ Increased vessel and vehicular traffic ▪ Increased emissions from vehicles and other construction equipment ▪ Increased noise ▪ Odors and dust from the upland staging area where mechanically dredged sediments are stockpiled and processed for offsite disposal ▪ Potential risk to workers from accidents or exposure to COCs ▪ Temporary destruction of the benthic community in dredged and capped areas ▪ Potential environmental impacts from suspended sediment during dredging ▪ Potential environmental impacts from leaks in the pipeline transporting hydraulically-dredged sediment to the DMMF Engineering and operational controls will be used to reduce and manage impacts during remedy construction and implementation. Plans will be developed during remedial design to establish requirements for air quality monitoring, noise monitoring, health and safety, waste management, traffic safety, and other activities. Turbidity monitoring and controls will be used to manage potential environmental impacts from sediment resuspension during dredging. The magnitude of the impacts is related to the duration of the remedial action. RAOs will be achieved when remedy construction is complete.	(Estimated in-water remedial action time = 6 months). Potential adverse impacts are the same as those for Alternative 2; however, the duration of the remedial action will be shorter because less sediment would be dredged and capped. The benthic community would be temporarily destroyed over a smaller area for Alternative 3 (56 acres) compared to Alternative 2 (90 acres). RAOs will be achieved when remedy construction is complete, which will be sooner than for Alternative 2.	(Estimated in-water remedial action time = 5 months). Potential adverse impacts are the same as those for Alternatives 2 and 3; however, the benthic community would be destroyed over a smaller area for Alternative 3A compared to Alternative 2. RAOs will be achieved when remedy construction is complete, which will be sooner than for Alternative 2.	(Estimated in-water remedial action time = 5 months). Potential adverse impacts are the same as those for Alternatives 2, 3, or 3A; however, the benthic community would be temporarily destroyed over a smaller area for Alternative 4 because less sediment will be dredged and capped. RAOs will be achieved when remedy construction is complete, which is estimated to be an identical timeframe compared to Alternative 3A.

Criterion	Alternative 1 No Action	Alternative 2	Alternative 3	Alternative 3A	Alternative 4
2(c). Balancing Criterion: Implementability Technical feasibility, including ease of implementation, reliability, constructability, availability of goods and services, and potential difficulties or constraint associated with construction or disposal; and administrative feasibility, including activities and time needed to obtain permits and approvals, the need for institutional controls, and degree of coordination with other agencies.	Easily implementable because no remedial action would be taken.	The remediation methods associated with this alternative (except in situ stabilization) have been implemented at numerous other sites and have been proven to be constructible and reliable. In situ stabilization to increase sediment strength and bearing capacity is more challenging to implement. All goods and services are expected to be readily available. Potential difficulties and constraints associated with this alternative include: ▪ Limitations on DMMF capacity for disposal of dredged sediment ▪ Limited access for construction equipment near and under bridges ▪ Protection of utility corridors that cross the river ▪ Bulkhead stability ▪ Limited availability of upland staging areas for processing mechanically dredged sediments ▪ Segregation and management of sediments with Toxic Substance Control Act-level PCB concentrations A range of permits and approvals are required for implementing this alternative as detailed in Appendix C of this document. This alternative requires extensive coordination with other agencies and parties including the project partners (U.S. Environmental Protection Agency, Wisconsin Department of Natural Resources [WDNR], the City of Milwaukee, Milwaukee County, Milwaukee Metropolitan Sewerage District), the Port of Milwaukee, U.S. Army Corps of Engineers, and affected property owners and businesses. Institutional controls will be discussed further with project partners during remedial design.	Same considerations as Alternative 2, but more implementable than Alternative 2 because the volume of dredged sediment is lower and therefore disposal requires less DMMF capacity. Cap area requiring agency coordination and approval is less than Alternative 2.	Same considerations as Alternatives 2, but more implementable than Alternatives 2 and 3 because the volume of dredged sediment is lower and therefore disposal requires less DMMF capacity. The combined area for cap and sand cover that requires agency coordination and approval is greater than Alternative 3 and smaller than Alternative 2.	Same as considerations Alternative 2, but more implementable than Alternatives 2, 3 and 3A because of the lower volume of dredged sediment and therefore, disposal requires less DMMF capacity. Cap area requiring agency coordination and approval is less than Alternatives 2, 3, and 3A.
2(d). Balancing Criterion: Restoration Time Frame	No remedial action; therefore, not applicable.	The benthic community is expected to naturally recolonize the dredged and capped surface within several months after the remedy has been completed. Upland staging and laydown areas will be restored to the pre-remedy condition during demobilization.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Alternative Cost	$0	$134,543,000	$91,531,000	$80,575,000	$86,055,000
Grand Trunk Wetland Cost	$0	$7,590,000	$7,590,000	$ 7,590,000	$7,590,000
2(e). Balancing Criterion: Total Cost [b] (As Estimated)	$0	$142,133,000	$99,121,000	$ 88,165,000	$93,645,000
3. Modifying Criterion: Project Partner Acceptance [c]	[c]	[c]	[c]	[c]	[c]

Source: Wisconsin Department of Natural Resources (WDNR) 2003. *Wisconsin Consensus-based Sediment Quality Guidelines. Recommendations for Use and Application, Interim Guidance* RR-088. December.

[a] "Residual contamination" and "contaminated sediment" for each alternative is defined as sediment with COC concentrations above the screening levels for that alternative.

[b] Total cost is detailed in Appendix D to this document.

[c] Evaluated after the project partners reviewed and provided comments on the remedial alternatives and associated individual and comparative alternative analyses. Project partner acceptance was considered when selecting the recommended alternative.

BUI = beneficial use impairment
COC = contaminant of concern
CUG = cleanup goal
DMMF = dredged materials management facility
FNC = federal navigation channel
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
RAO = Remedial Action Objective
RTA = remediation target area
WDNR = Wisconsin Department of Natural Resources

Figures

Milwaukee River Floodplains Reach
Milwaukee River Downtown Reach
Menomonee River
South Menomonee Canal
Burnham Canal Superfund Alternative Site and Habitat Restoration
Milwaukee River - Third Ward
Kinnickinnic River
Former North Avenue Dam
McKinley Marina
Northern Outer Harbor
Milwaukee Bay
Summerfest Lagoons
South Slip #2
Southern Outer Harbor
Turning Basin
Grand Trunk Wetlands
DMMF
Jones Island CDF
Lake Michigan
W HAMPTON AVE
E HAMPTON AVE
ESTABROOK PKWY
N GREEN BAY AVE
N PORT WASHINGTON RD
W CAPITOL DR
N TEUTONIA AVE
N SHERMAN BLVD
Milwaukee River
N OAKLAND AVE
N LAKE DR
E BURLEIGH ST
E LOCUST ST
W LOCUST ST
N 40TH ST
I-43 FWY
N MARTIN L KING JR DR
145
W CENTER ST
E CENTER ST
N 27TH ST
N 20TH ST
N HUMBOLDT BLVD
W FOND DU LAC AVE
N 35TH ST
W NORTH AVE
E NORTH AVE
N HOLTON ST
W LISBON AVE
E BRADY ST
N VAN BUREN ST
N LINCOLN MEMORIAL DR
43
W JUNEAU AVE
N WATER ST
W STATE ST
E WELLS ST
18
E WISCONSIN AVE
W WISCONSIN AVE
W ST PAUL AVE
Menomonee River
94
W CANAL ST
E ERIE ST
I-794 FWY
S 2ND ST
S 6TH ST
W NATIONAL AVE
S 1ST ST
S 35TH ST
W GREENFIELD AVE
S 27TH ST
Kinnickinnic River
W BURNHAM ST
W BECHER ST
W LINCOLN AVE
S KINNICKINNIC AVE
W CLEVELAND AVE

N
0 1500 3000
Feet

LEGEND

- Floodplain Area Boundary
- Milwaukee Bay
- Menomonee River
- Kinnickinnic River
- Milwaukee River Downtown
- Milwaukee River Floodplain
- Milwaukee River - Third Ward
- South Menomonee Canal
- Greater Milwaukee GLLA Project Agreement boundary

Notes:
1. CDF = confined disposal facility; DMMF = dredged materials management facility; GLLA = Great Lakes Legacy Act
2. 2022 Aerial Photography provided by Esri ArcGIS Online World Imagery.

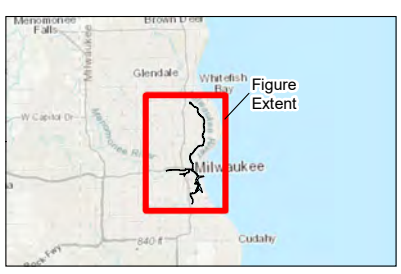


Figure 1-1 Regional Features
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

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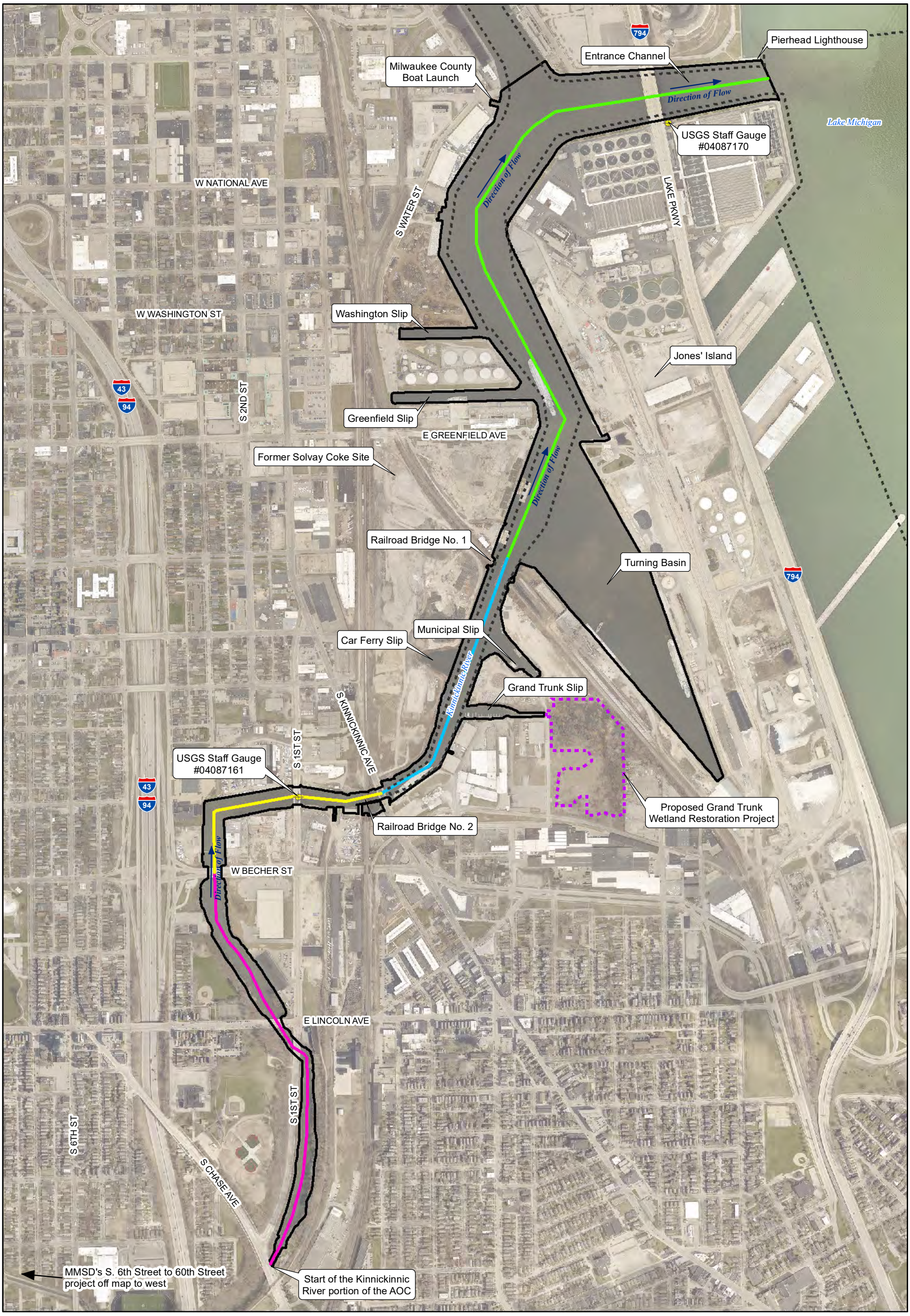

LEGEND

- Staff Gauge
- Proposed Grand Trunk Wetland Restoration Project
- Federal Navigation Channel
- Kinnickinnic River Project Area

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3
- Reach 4

N

0 400 800

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. AOC = Milwaukee Estuary Area of Concern; KK = Kinnickinnic River; MMSD = Milwaukee Metropolitan Sewerage District; USGS = United States Geological Survey

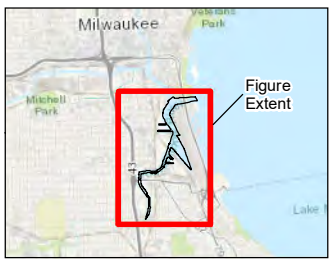

Figure 1-2
Project Area Overview - Kinnickinnic River
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

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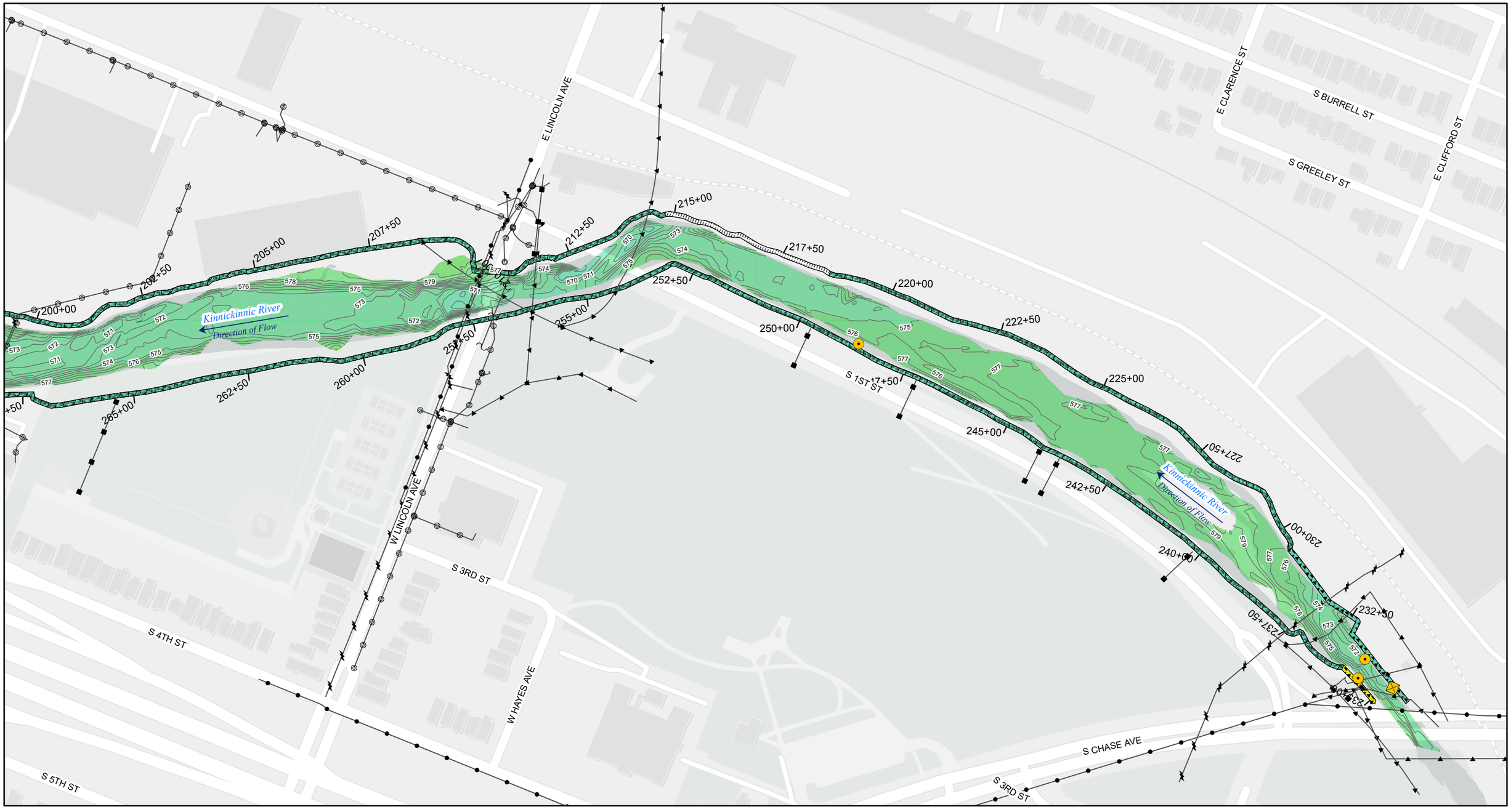

LEGEND

- Combined Sewer Outfall
- Storm Sewer Outfall

Utilities

- Electric
- Fiber Optic
- Gas
- Sanitary Sewer
- Storm Sewer
- Water Line

Shoreline Type

- Concrete
- Natural Shoreline with Vegetation
- Timber Piles

Condition Level

- Good
- Fair
- Unassigned

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 534 - 535
- 535 - 540
- 540 - 545
- 545 - 550

N

0 100 200

Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
4. Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks reported in *Final Report for Milwaukee, WI Area of Concern, Bathymetric Investigation (2020).*

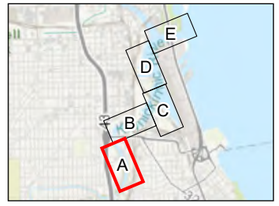

Figure 1-3A
Site Features - Kinnickinnic River Reach 1
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

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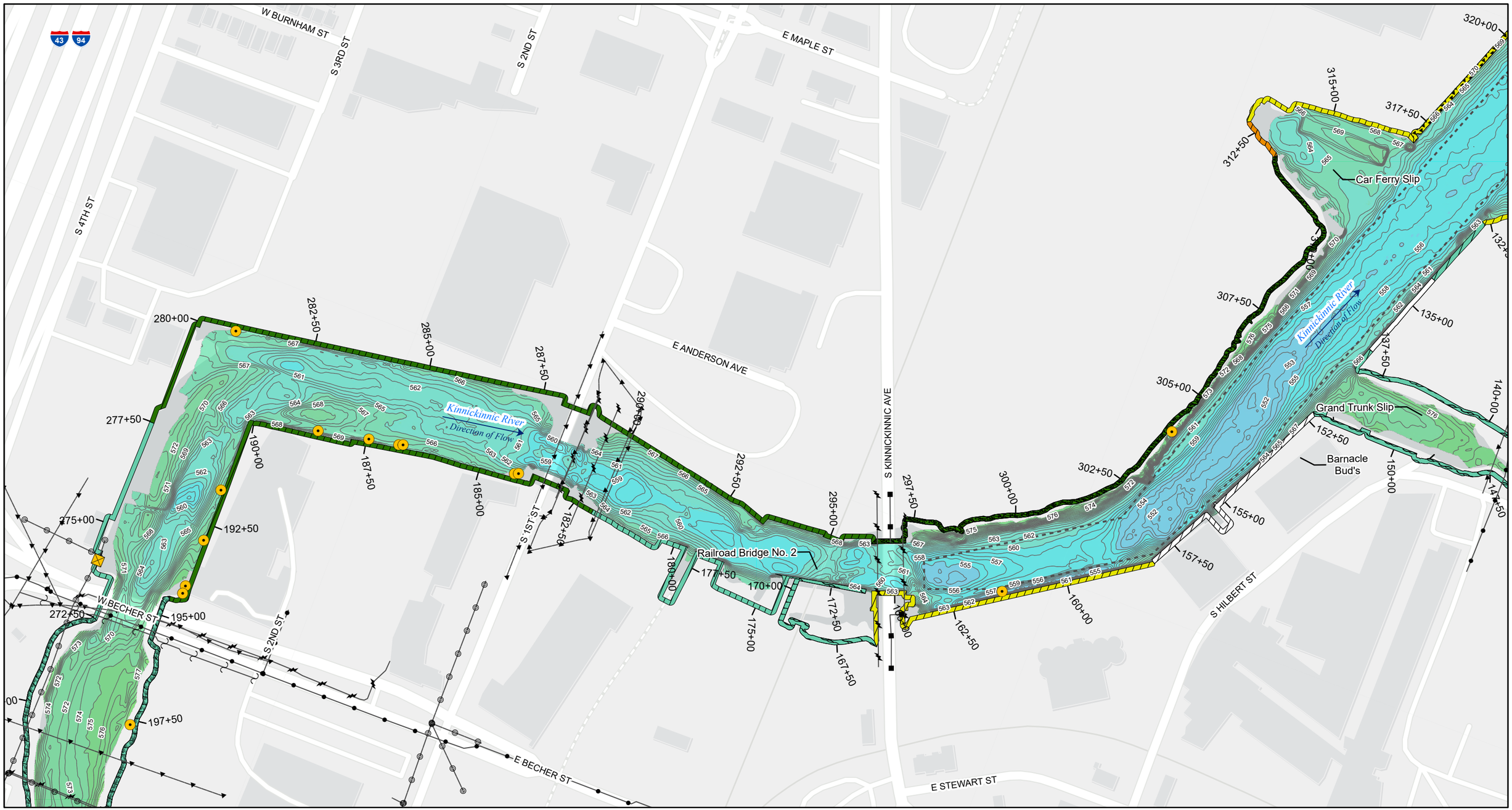

LEGEND

- Combined Sewer Outfall
- Storm Sewer Outfall

Utilities

- Electric
- Fiber Optic
- Gas
- Sanitary Sewer
- Storm Sewer
- Water Line

Shoreline Type

- Concrete
- Natural Shoreline
- Natural Shoreline with Riprap
- Natural Shoreline with Vegetation
- No Data
- Steel Sheet Pile

Condition Level

- Excellent
- Good
- Fair
- Marginal
- Unassigned

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 534 - 535
- 535 - 540
- 540 - 545
- 545 - 550
- 550 - 555
- 555 - 560
- 560 - 565

0 100 200

Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
4. Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks reported in *Final Report for Milwaukee, WI Area of Concern, Bathymetric Investigation (2020).*

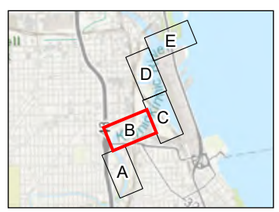

Figure 1-3B
Site Features - Kinnickinnic River
Reaches 1, 2, and 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

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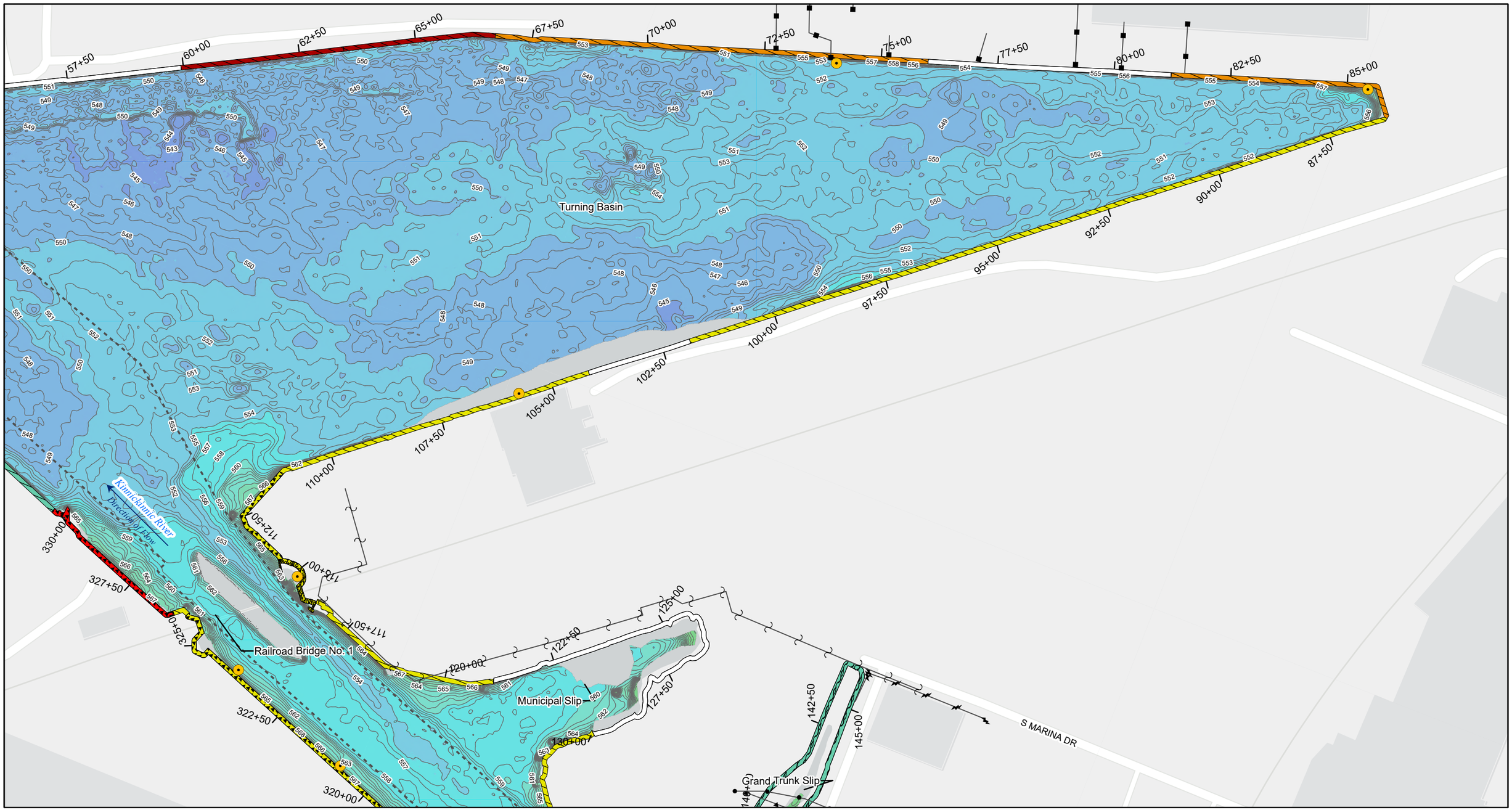


LEGEND

- Storm Sewer Outfall

Utilities
- Electric
- Gas
- Sanitary Sewer
- Storm Sewer
- Water Line

Shoreline Type
- Concrete
- Natural Shoreline
- Natural Shoreline with Riprap
- No Data
- Steel Sheet Pile

Condition Level
- Good
- Fair
- Marginal
- Poor
- Very Poor
- Unassigned

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 534 - 535
- 535 - 540
- 540 - 545
- 545 - 550
- 550 - 555
- 555 - 560
- 560 - 565
- 565 - 570
- 570 - 575

0 100 200
Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
4. Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks reported in *Final Report for Milwaukee, WI Area of Concern, Bathymetric Investigation (2020)*.
5. Approximately 22 percent of the Turning Basin and 5 percent of the remaining shoreline in Reach 4 could not be assigned a bulkhead type and structural condition level because of the presence of a docked barge and/or support vessel obstructing inspection of the shoreline.

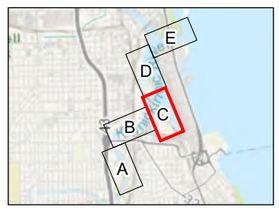


Figure 1-3C
Site Features - Kinnickinnic River
Reach 3, Reach 4, and Turning Basin
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Kinnickinnic River
Direction of Flow
Washington Slip
Greenfield Slip
E NATIONAL AVE
S WATER ST
E WASHINGTON ST
S BARCLAY ST
E GREENFIELD AVE

LEGEND

- Combined Sewer Outfall
- Storm Sewer Outfall

Utilities

- Electric
- Fiber Optic
- Sanitary Sewer
- Storm Sewer

Shoreline Type

- Concrete
- Natural Shoreline with Riprap
- No Data
- Steel Sheet Pile
- Timber Piles

Condition Level

- Good
- Fair
- Marginal
- Poor
- Unassigned
- Not Evaluated

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 535 - 540
- 540 - 545
- 545 - 550
- 550 - 555
- 555 - 560
- 560 - 565
- 565 - 570
- 570 - 575

0 100 200
Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
4. Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks reported in *Final Report for Milwaukee, WI Area of Concern, Bathymetric Investigation (2020).*

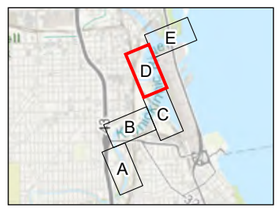
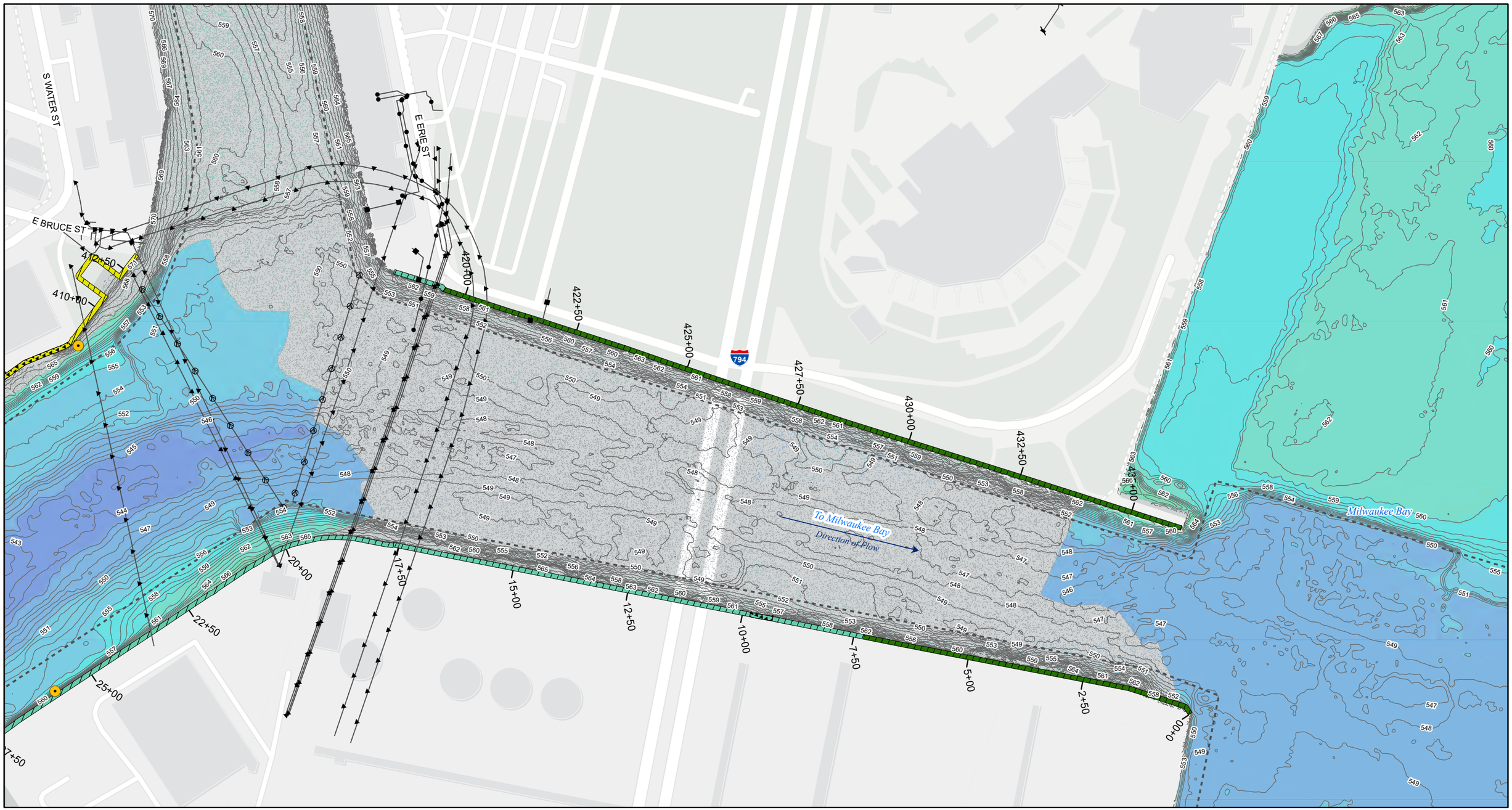


Figure 1-3D
Site Features - Kinnickinnic River
Reach 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Storm Sewer Outfall

Utilities

- Sanitary Sewer
- Storm Sewer
- Telecom
- Utility Identified during Menomonee and Milwaukee River FFS
- Water Line

Shoreline Type

- Concrete
- Steel Sheet Pile

Condition Level

- Excellent
- Good
- Fair

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 535 - 540
- 540 - 545
- 545 - 550
- 550 - 555
- 555 - 560
- 560 - 565
- 565 - 570
- 570 - 575

N

0 100 200

Approximate scale in feet

Notes:

1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
4. Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks reported in *Final Report for Milwaukee, WI Area of Concern, Bathymetric Investigation (2020)*.
5. Bathymetric surface point data provided by Seaworks within portions of this figure extent contained gaps and therefore the derived colored shading is not continuous.

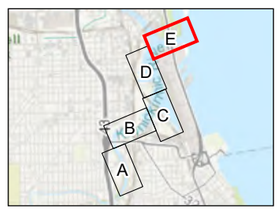


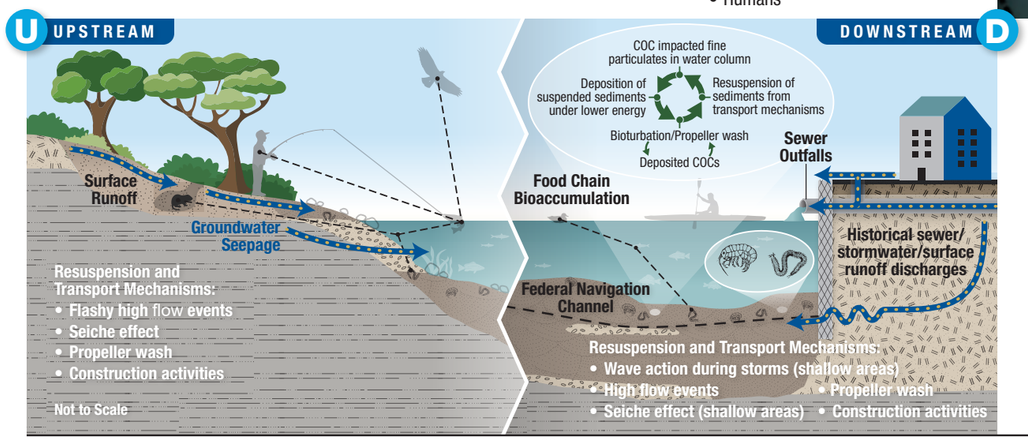
Figure 1-3E
Site Features - Kinnickinnic River
Reach 4, Continued
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Primary COCs:
- Polychlorinated Biphenyls
- Polycyclic Aromatic Hydrocarbons
- Metals

Primary Sources:
- Historical industry
- Sewer outfalls
- Non-point sources (surface runoff, construction activities, etc.)

Receptors:
- Benthic Invertebrates
- Aquatic Invertebrates
- Fish
- Piscivorous birds and mammals
- Humans



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | © 2022 Microsoft Corporation, © 2022 Maxar, © CNES (2022) Distribution Airbus DS

Inset Legend

- Sand and Gravel Seams
- Fill and Soil
- Compacted Native Material (Low Permeability, Dense Clays and Silts)
- Soft Sediment (Clays and Silts Rich in Organics)
- Potential Pathways for Contaminants of Concern (COCs)

Map Legend

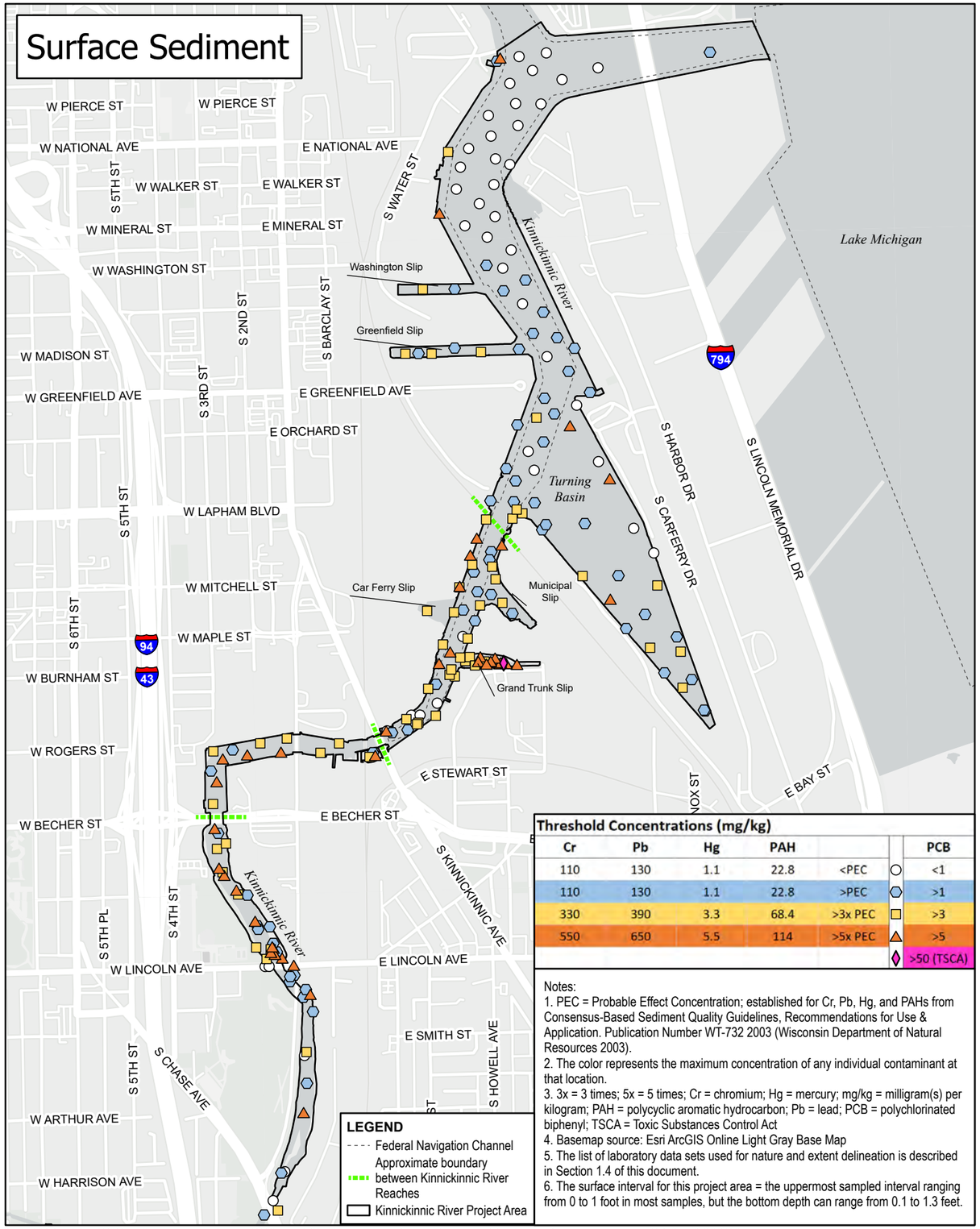
- River Flow Direction
- Federal Navigation Channel

Note: Approximately 22 percent of the Turning Basin and 5 percent of the remaining shoreline in Reach 4 could not be assigned a bulkhead type and structural condition level because of the presence of a docked barge and/or support vessel obstructing inspection of the shoreline.

Figure 2-1
Conceptual Site Model
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Surface Sediment



Threshold Concentrations (mg/kg)

Cr	Pb	Hg	PAH		PCB
110	130	1.1	22.8	<PEC	<1
110	130	1.1	22.8	>PEC	>1
330	390	3.3	68.4	>3x PEC	>3
550	650	5.5	114	>5x PEC	>5
					>50 (TSCA)

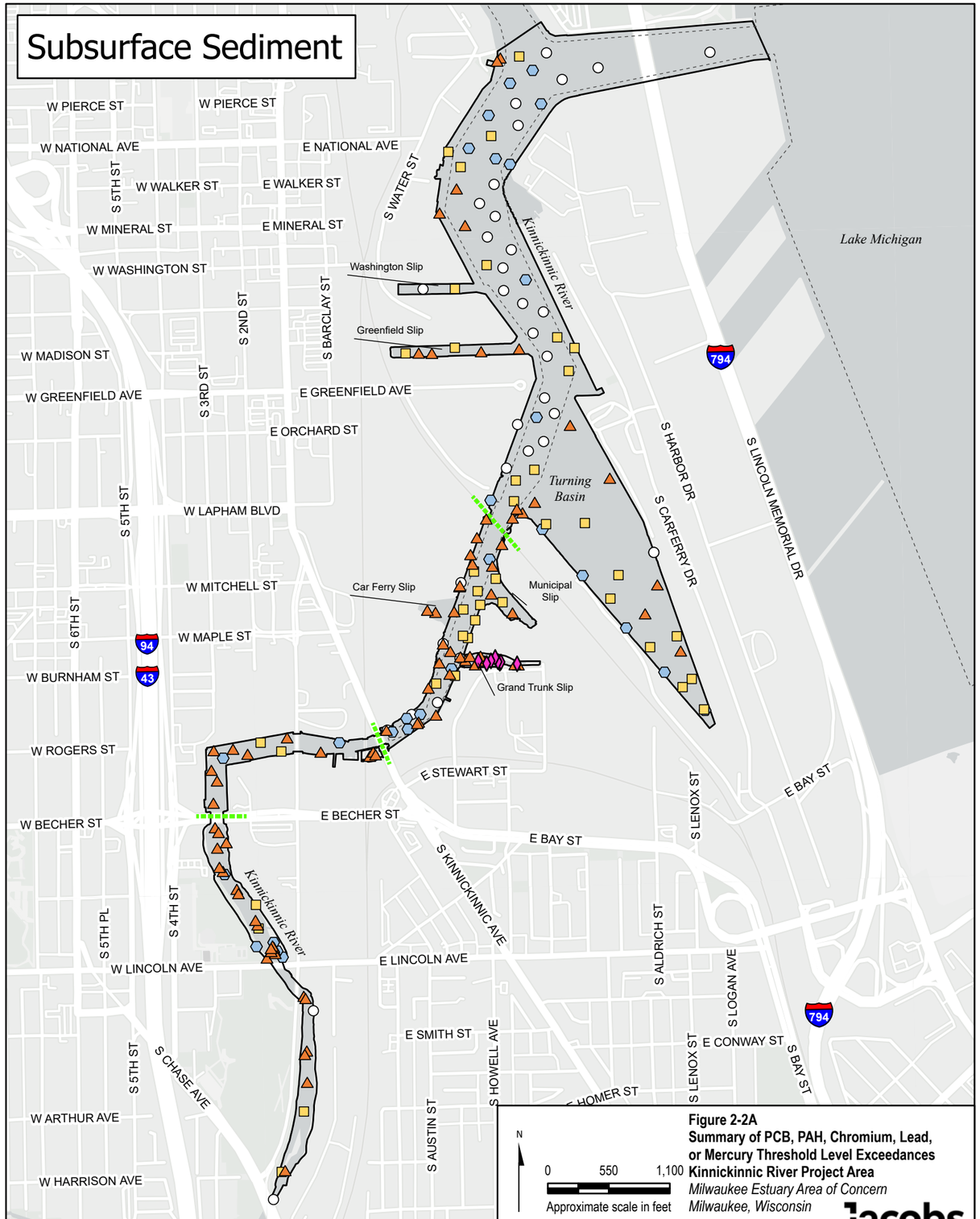
LEGEND

- Federal Navigation Channel
- Approximate boundary between Kinnickinnic River Reaches
- Kinnickinnic River Project Area

Notes:

1. PEC = Probable Effect Concentration; established for Cr, Pb, Hg, and PAHs from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
2. The color represents the maximum concentration of any individual contaminant at that location.
3. 3x = 3 times; 5x = 5 times; Cr = chromium; Hg = mercury; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; TSCA = Toxic Substances Control Act
4. Basemap source: Esri ArcGIS Online Light Gray Base Map
5. The list of laboratory data sets used for nature and extent delineation is described in Section 1.4 of this document.
6. The surface interval for this project area = the uppermost sampled interval ranging from 0 to 1 foot in most samples, but the bottom depth can range from 0.1 to 1.3 feet.

Subsurface Sediment



N

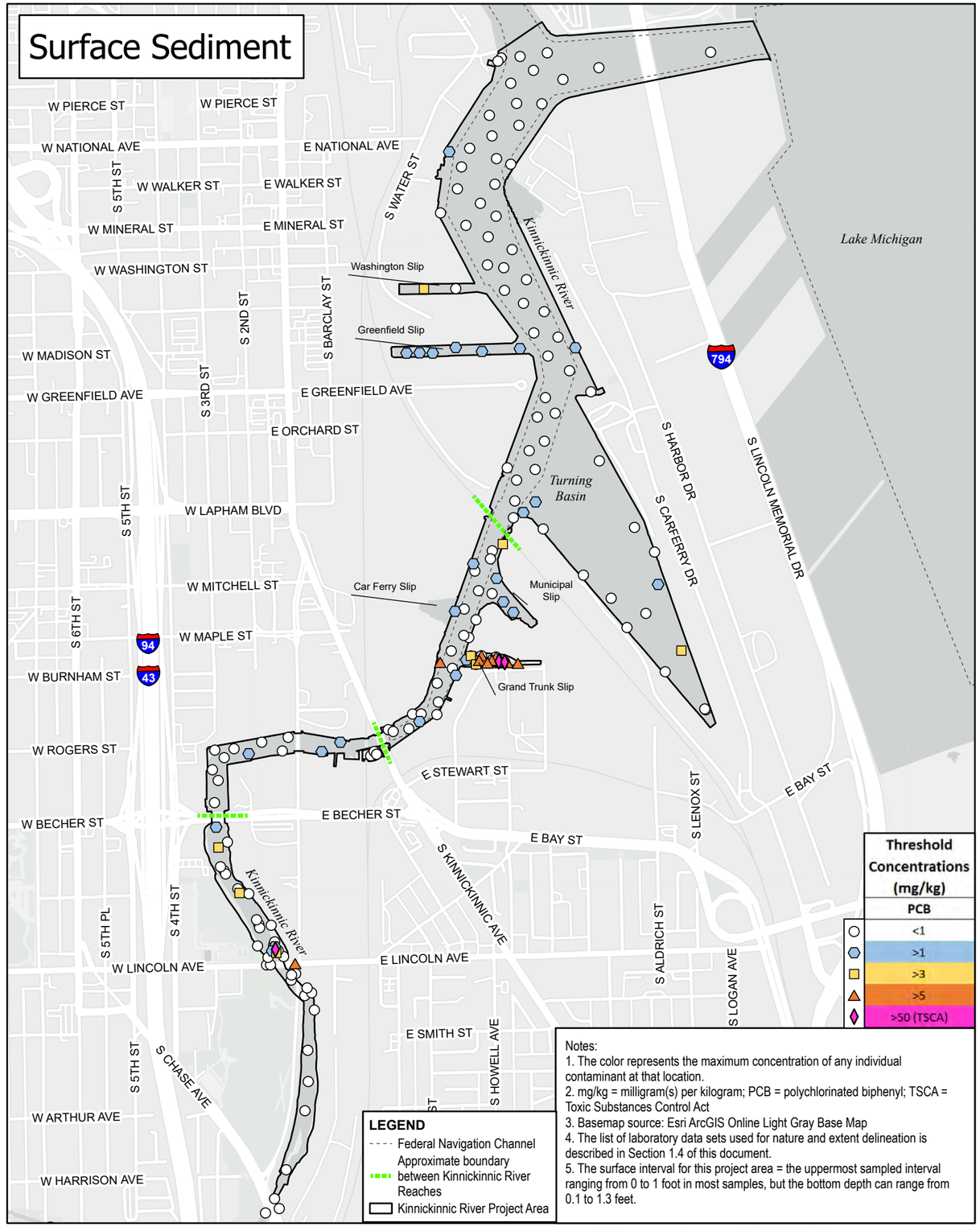
0 550 1,100

Approximate scale in feet

Figure 2-2A
Summary of PCB, PAH, Chromium, Lead, or Mercury Threshold Level Exceedances
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Surface Sediment



Threshold Concentrations (mg/kg)
PCB
<1
>1
>3
>5
>50 (TSCA)

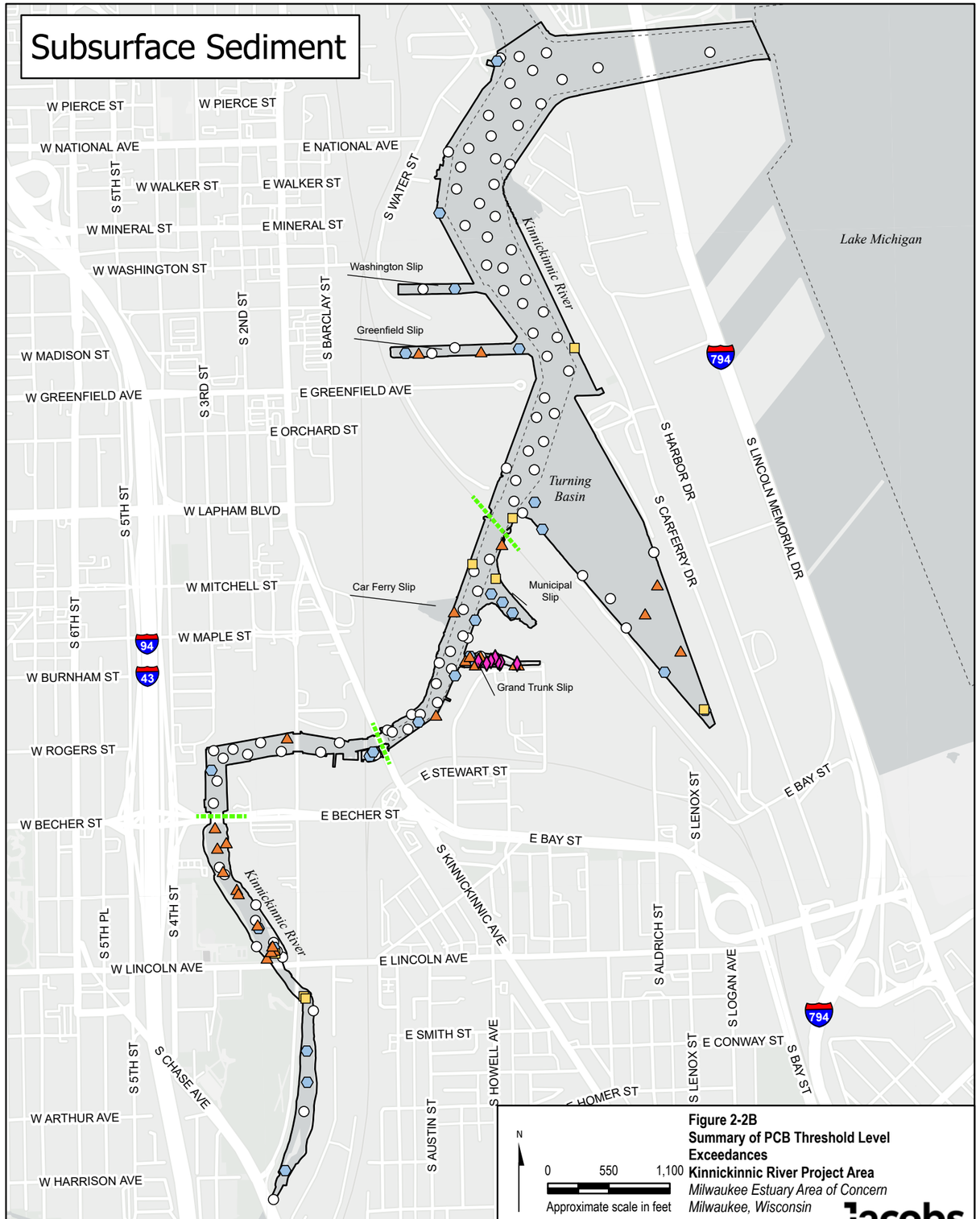
LEGEND

- Federal Navigation Channel
- Approximate boundary between Kinnickinnic River Reaches
- Kinnickinnic River Project Area

Notes:

1. The color represents the maximum concentration of any individual contaminant at that location.
2. mg/kg = milligram(s) per kilogram; PCB = polychlorinated biphenyl; TSCA = Toxic Substances Control Act
3. Basemap source: Esri ArcGIS Online Light Gray Base Map
4. The list of laboratory data sets used for nature and extent delineation is described in Section 1.4 of this document.
5. The surface interval for this project area = the uppermost sampled interval ranging from 0 to 1 foot in most samples, but the bottom depth can range from 0.1 to 1.3 feet.

Subsurface Sediment



N

0 550 1,100

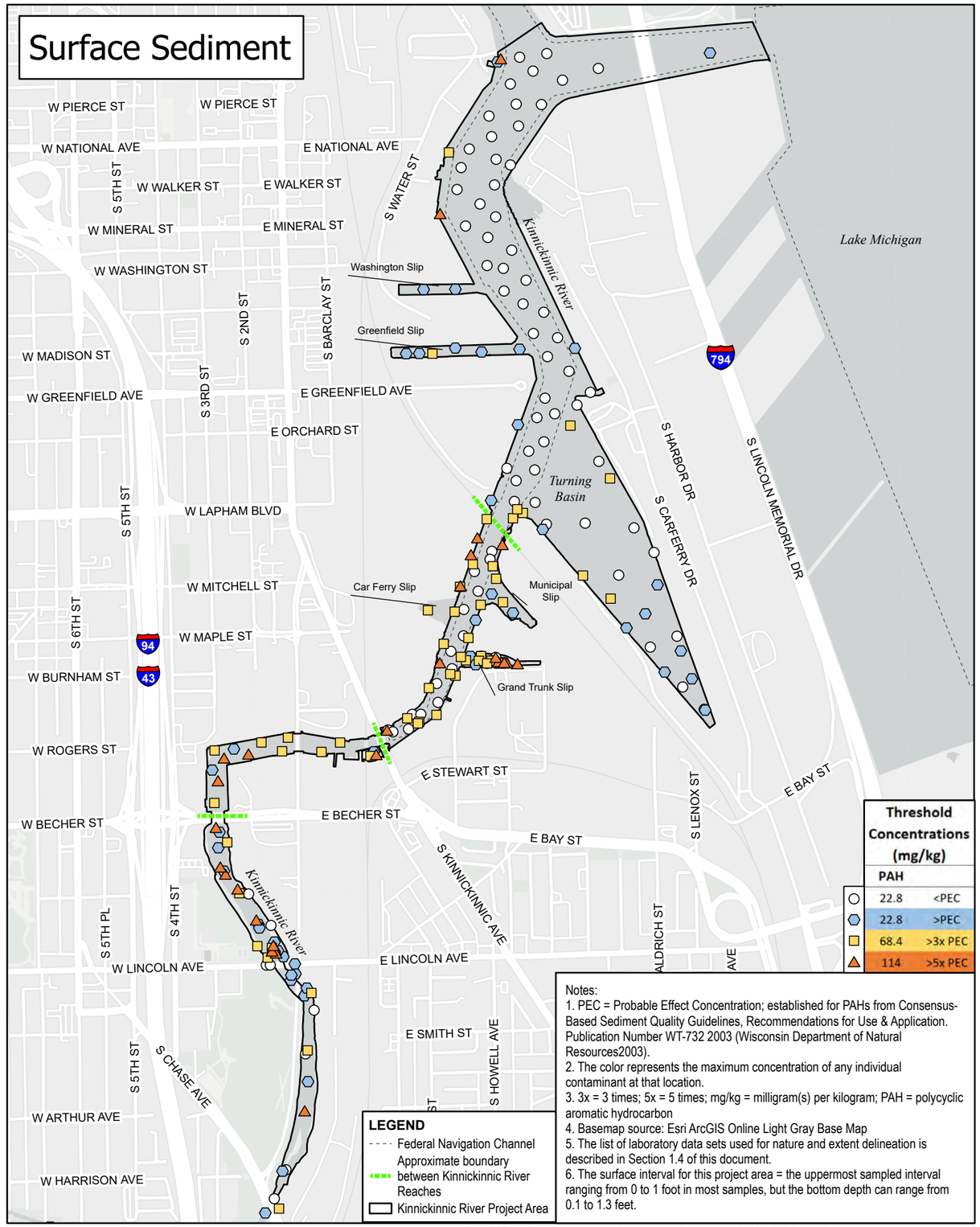
Approximate scale in feet

Figure 2-2B
Summary of PCB Threshold Level Exceedances
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

\\dc1vs01\GISProj\E\EPA\681867_MKERiverDownstream\ProDocs\2022\Figure 2-2X_KK_river_summary_figures_508.aprx-Figure2-2B_KK_River_Summary of PCB Threshold Level Exceedances_508 STOLZRC (9/8/2024)

Surface Sediment



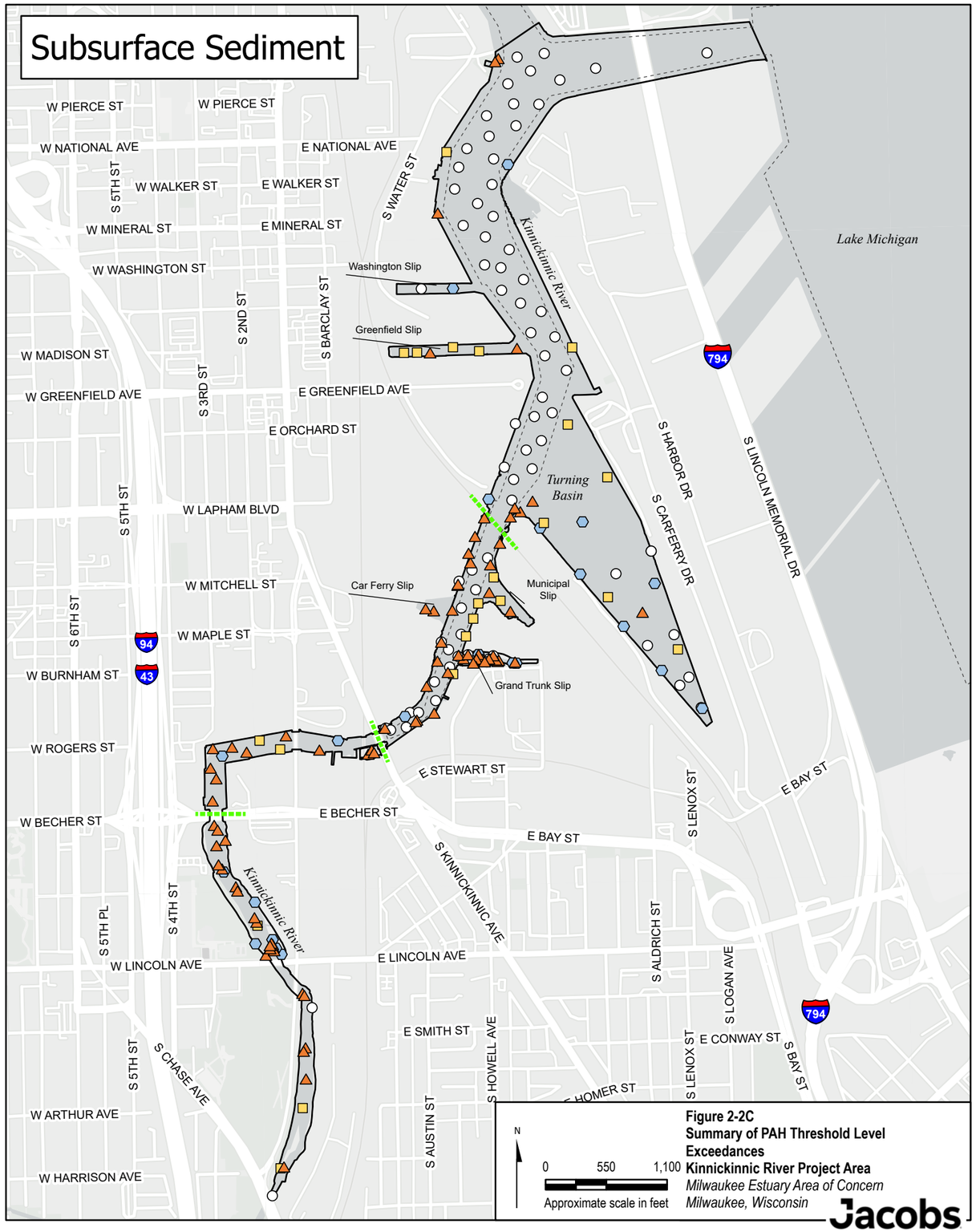
Threshold Concentrations (mg/kg)	
PAH	
22.8	<PEC
22.8	>PEC
68.4	>3x PEC
114	>5x PEC

LEGEND

- Federal Navigation Channel
- Approximate boundary between Kinnickinnic River Reaches
- Kinnickinnic River Project Area

Notes:
1. PEC = Probable Effect Concentration; established for PAHs from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources2003).
2. The color represents the maximum concentration of any individual contaminant at that location.
3. 3x = 3 times; 5x = 5 times; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon
4. Basemap source: Esri ArcGIS Online Light Gray Base Map
5. The list of laboratory data sets used for nature and extent delineation is described in Section 1.4 of this document.
6. The surface interval for this project area = the uppermost sampled interval ranging from 0 to 1 foot in most samples, but the bottom depth can range from 0.1 to 1.3 feet.

Subsurface Sediment



N

0 550 1,100

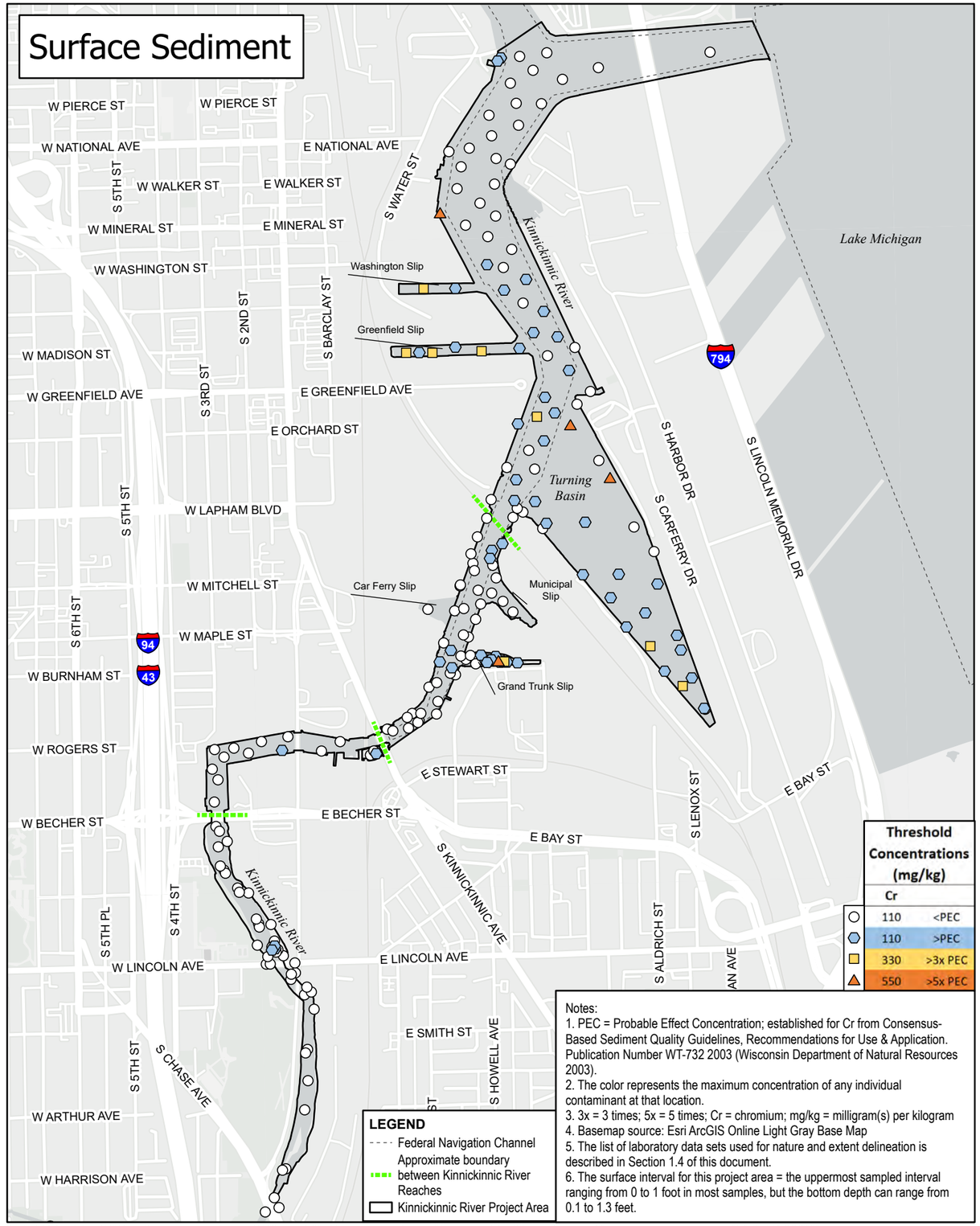
Approximate scale in feet

Figure 2-2C
Summary of PAH Threshold Level Exceedances
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

\\dc1vs01\GISProj\E\EPA\681867_MKERiverDownstream\ProDocs\2022\Figure 2-2X_KK_river_summary_figures_508.aprx-Figure2-2C_KK_River_Summary of PAH Threshold Level Exceedances_508 STOLZRC (9/8/2024)

Surface Sediment



Threshold Concentrations (mg/kg)

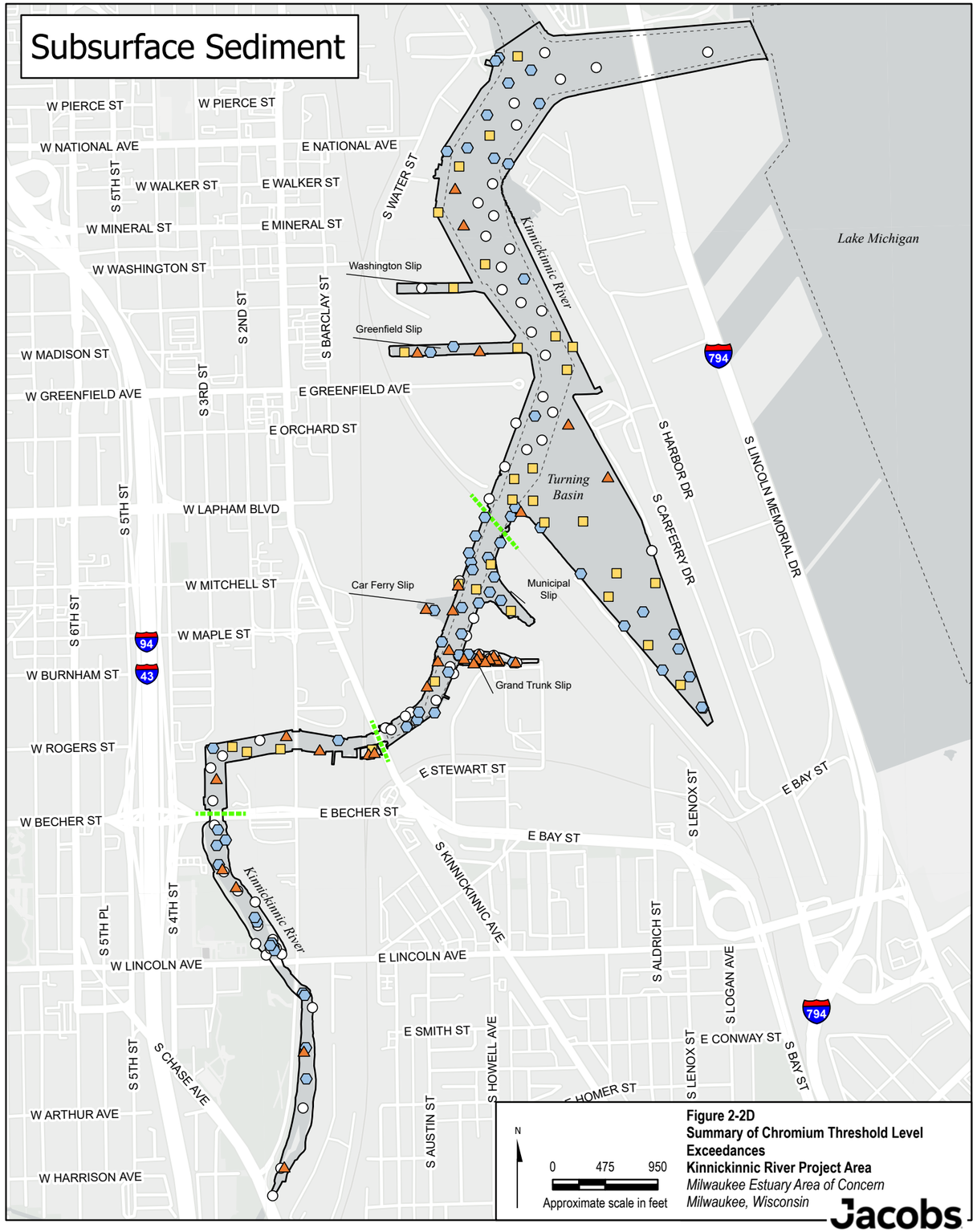
	Cr	
○	110	<PEC
⬡	110	>PEC
□	330	>3x PEC
△	550	>5x PEC

LEGEND

- Federal Navigation Channel
- Approximate boundary between Kinnickinnic River Reaches
- Kinnickinnic River Project Area

Notes:
1. PEC = Probable Effect Concentration; established for Cr from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
2. The color represents the maximum concentration of any individual contaminant at that location.
3. 3x = 3 times; 5x = 5 times; Cr = chromium; mg/kg = milligram(s) per kilogram
4. Basemap source: Esri ArcGIS Online Light Gray Base Map
5. The list of laboratory data sets used for nature and extent delineation is described in Section 1.4 of this document.
6. The surface interval for this project area = the uppermost sampled interval ranging from 0 to 1 foot in most samples, but the bottom depth can range from 0.1 to 1.3 feet.

Subsurface Sediment



N

0 475 950

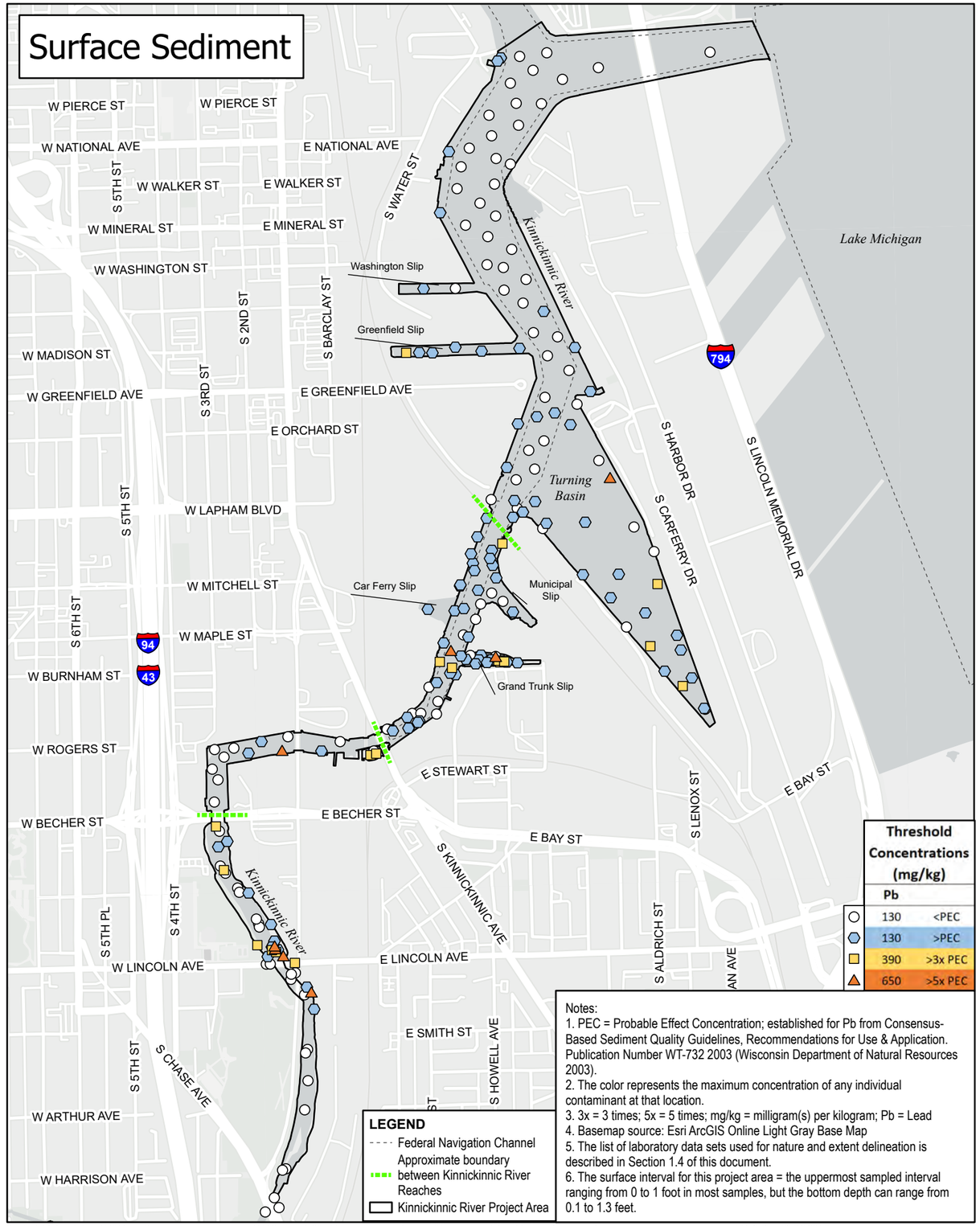
Approximate scale in feet

Figure 2-2D
Summary of Chromium Threshold Level Exceedances
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

\\dc1vs01\GISProj\E\EPA\681867_MKERiverDownstream\ProDocs\2022\Figure 2-2X_KK_river_summary_figures_508.aprx-Figure2-2D_KK_River_Summary of Cr Threshold Level Exceedances_508 STOLZRC (9/8/2024)

Surface Sediment



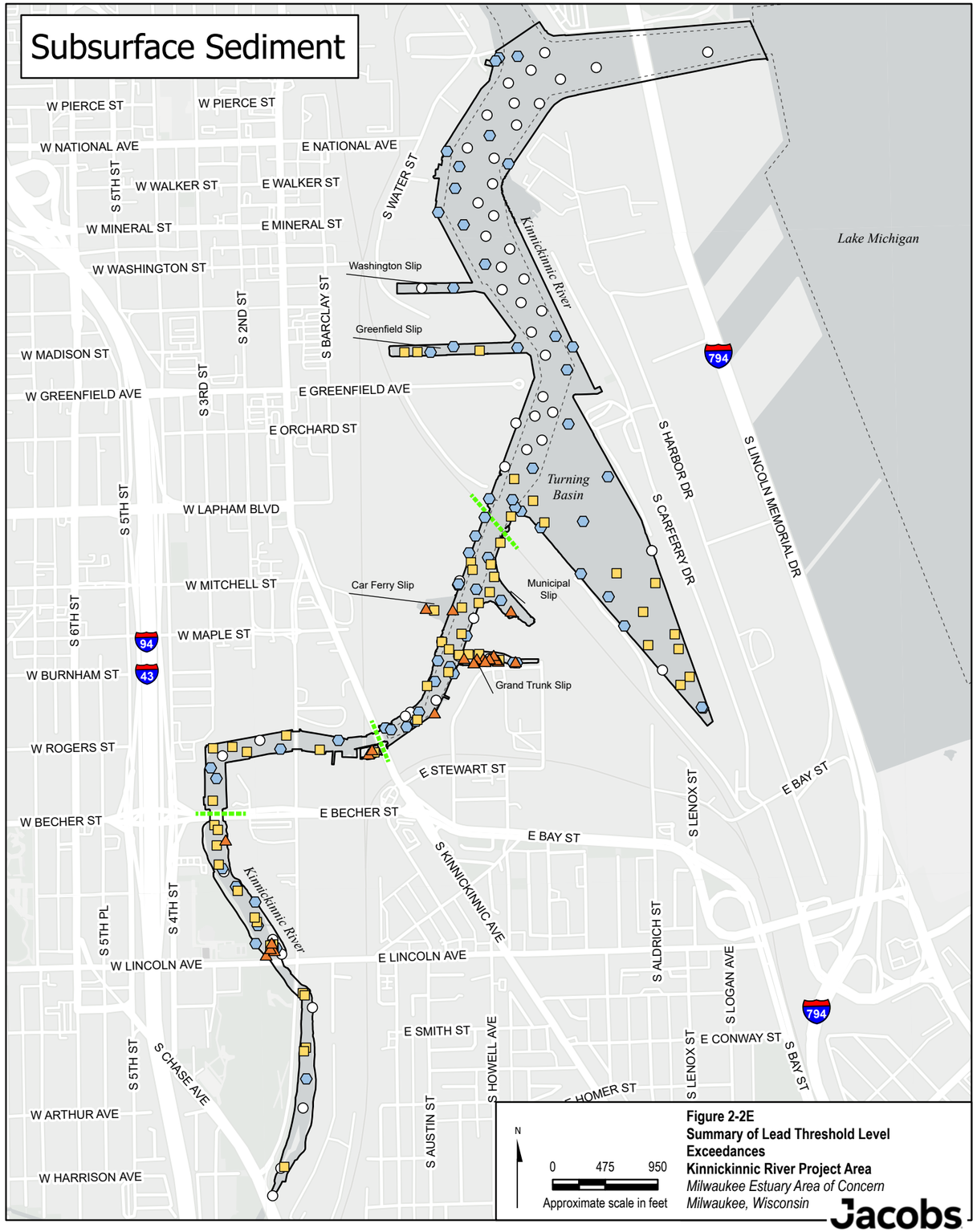
Threshold Concentrations (mg/kg)	Pb	
○	130	<PEC
⬡	130	>PEC
□	390	>3x PEC
△	650	>5x PEC

LEGEND

- Federal Navigation Channel
- Approximate boundary between Kinnickinnic River Reaches
- Kinnickinnic River Project Area

Notes:
1. PEC = Probable Effect Concentration; established for Pb from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
2. The color represents the maximum concentration of any individual contaminant at that location.
3. 3x = 3 times; 5x = 5 times; mg/kg = milligram(s) per kilogram; Pb = Lead
4. Basemap source: Esri ArcGIS Online Light Gray Base Map
5. The list of laboratory data sets used for nature and extent delineation is described in Section 1.4 of this document.
6. The surface interval for this project area = the uppermost sampled interval ranging from 0 to 1 foot in most samples, but the bottom depth can range from 0.1 to 1.3 feet.

Subsurface Sediment



N

0 475 950

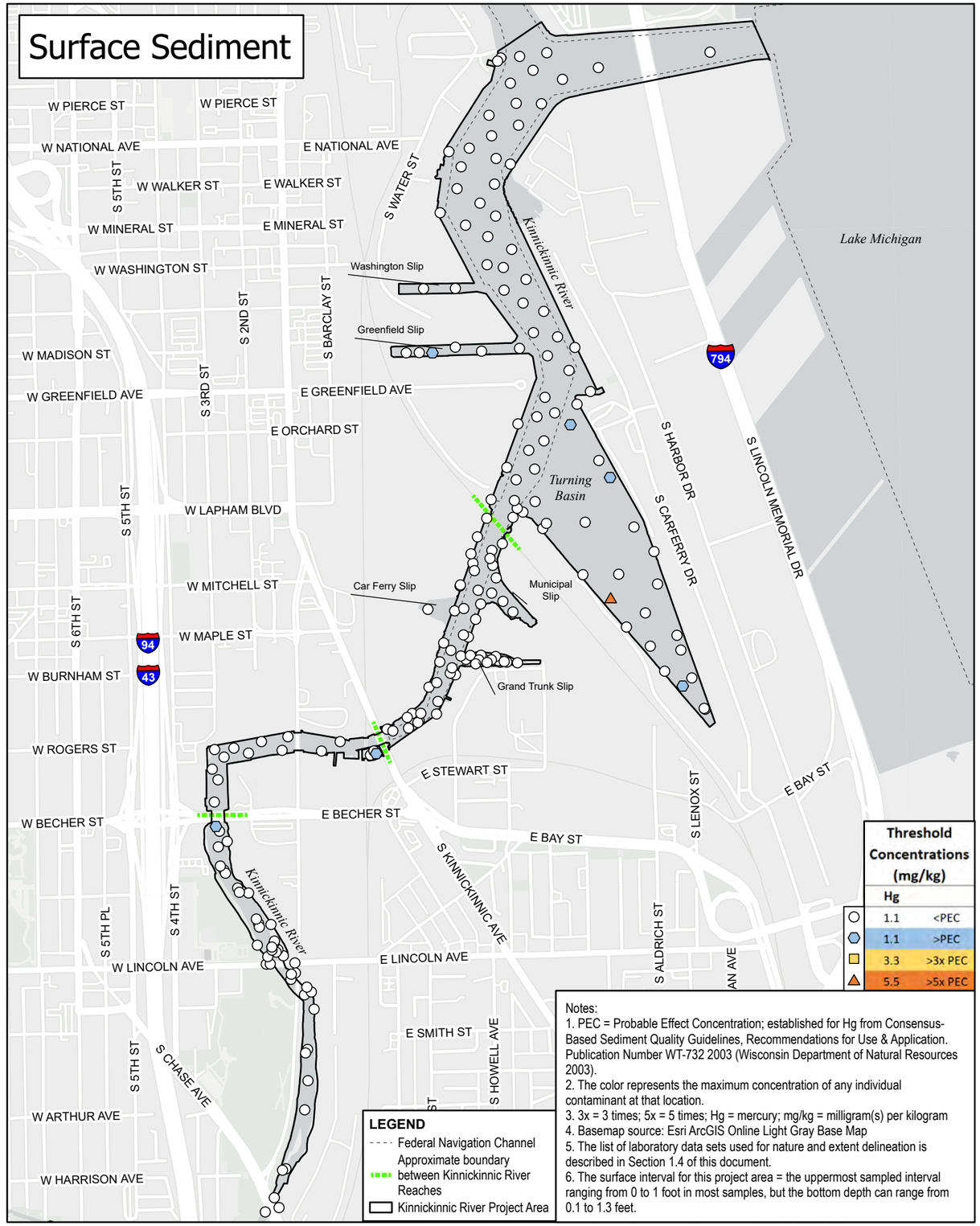
Approximate scale in feet

Figure 2-2E
Summary of Lead Threshold Level Exceedances
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

\\dc1vs01\GISProj\E\EPA\681867_MKERiverDownstream\ProDocs\2022\Figure 2-2X_KK_river_summary_figures_508.aprx-Figure2-2E_KK_River_Summary of Lead Threshold Level Exceedances_508 STOLZRC (9/8/2024)

Surface Sediment



Threshold Concentrations (mg/kg)

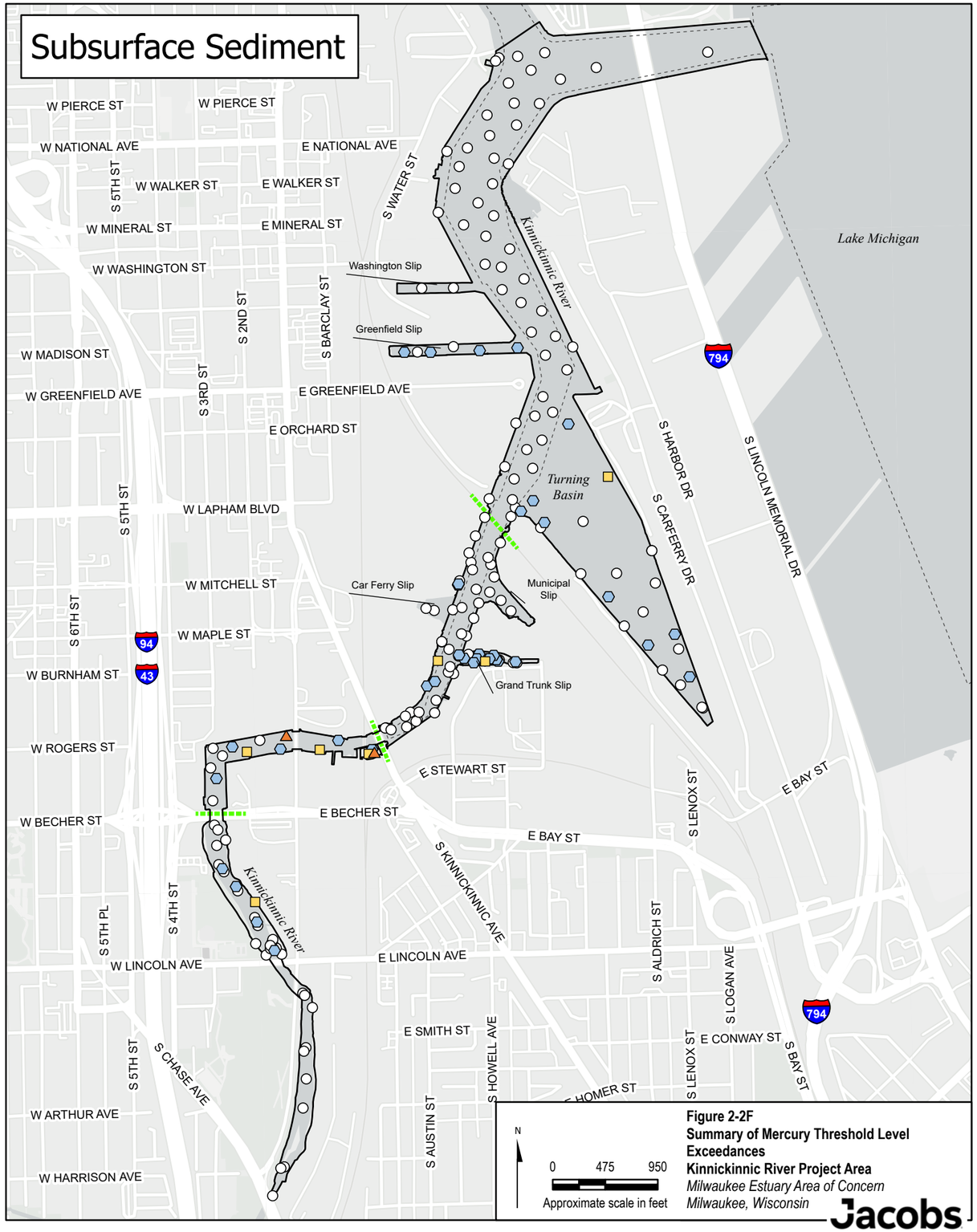
Hg	
1.1	<PEC
1.1	>PEC
3.3	>3x PEC
5.5	>5x PEC

LEGEND

- Federal Navigation Channel
- Approximate boundary between Kinnickinnic River Reaches
- Kinnickinnic River Project Area

Notes:
1. PEC = Probable Effect Concentration; established for Hg from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
2. The color represents the maximum concentration of any individual contaminant at that location.
3. 3x = 3 times; 5x = 5 times; Hg = mercury; mg/kg = milligram(s) per kilogram
4. Basemap source: Esri ArcGIS Online Light Gray Base Map
5. The list of laboratory data sets used for nature and extent delineation is described in Section 1.4 of this document.
6. The surface interval for this project area = the uppermost sampled interval ranging from 0 to 1 foot in most samples, but the bottom depth can range from 0.1 to 1.3 feet.

Subsurface Sediment



N

0 475 950

Approximate scale in feet

Figure 2-2F
Summary of Mercury Threshold Level Exceedances
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

\\dc1vs01\GISProj\E\EPA\681867_MKERiverDownstream\ProDocs\2022\Figure 2-2X_KK_river_summary_figures_508.aprx-Figure2-2F_KK_River_Summary of Mercury Threshold Level Exceedances_508 STOLZRC (9/8/2024)

KKR-20-004

576.9
NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	0.12	18	64	0.021	63.1
1 - 3	0.38	13	36	0.0095	21
3 - 5	3	65	310	0.24	238
5 - 6.7	2.8	130	370	0.45	429

KKR-20-003

577.5
NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	0.057	12	31	0.012	121
1 - 3	0.43	12	51	0.03	49.8
3 - 5	0.0037	27	89	0.23	98.1
5 - 6	0.0018	28	110	0.03	41.5

KK-SDU14

576.8

Depth	Cr	Pb	Hg	PAH
0 - 0.3	24	29	0.029	47.7
0.3 - 2	21	70	0.094	37.2
2 - 4.5	32	130	0.067	72.6

KKR-20-002

578.0
NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	0.098	12	30	0.017	15.5
1 - 3	0.062	20	37	0.054	20.8
3 - 5	1.6	130	340	0.047	332
5 - 6	0.1	580	530	0.54	376

KKR-20-001

572.9
NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	0.0065	14	8	0.017	2.3
1 - 2.9	0.0017	11	10	0.015	0.013

KKM-21-001

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	0.0021	50.1	63.2	0.13	73.1

S 1ST ST

S CHASE AVE

Kinnickinnic River

LEGEND

- Analytical Sample Location
- Kinnickinnic River Project Area

Utilities

- Electric
- Sanitary Sewer
- Storm Sewer
- Water Line

Kinnickinnic River Reach Areas

- Reach 1

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575

N

0 40 80

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-3A
Analytical Results Summary
Kinnickinnic River - Reach 1
Map 1 of 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

KKR-21-040

	Depth	PCB	Cr	Pb	Hg	PAH
581.1	0 - 0.9	0.18	54.2	254	0.23	46.9
NE	0.9 - 1.8	0.43	45	116	0.11	53.7

KKR-21-039

	Depth	PCB	Cr	Pb	Hg	PAH
576.5	0 - 0.4	0.96	51	243	0.38	119
NE	0.4 - 1.7	30.9	123	740	0.95	280
	1.7 - 3	5.4	59.3	335	0.33	231

KKR-21-035

	Depth	PCB	Cr	Pb	Hg	PAH
578.5	0 - 1	2.5	124	771	0.97	299
NE	1 - 3	1.6	75.1	519	0.4	243
	3 - 5.5	0.41	151	598	0.54	298
	5.5 - 7.8	0.32	215	475	0.58	182

KK-SDU12

	Depth	Cr	Pb	Hg	PAH
576.0	0 - 0.3	60	310	0.35	94.9
	0.3 - 2	79	350	0.33	172
	2 - 4	130	570	0.54	258
	4 - 6	210	420	0.48	269
	6 - 8	160	170	0.34	128

KKM-21-004

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	5.6	82.6	435	0.53	25.2

KKM-21-003

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	0.003	33	88.7	0.072	36.9

KKR-21-029

	Depth	PCB	Cr	Pb	Hg	PAH
576.9	0 - 0.3	0.22	48.5	123	0.073	63.8
NE						

KKR-21-034

	Depth	PCB	Cr	Pb	Hg	PAH
581.5	0 - 1	0.1	94.2	615	0.21	76.7
NE	1 - 1.2	0.1	33.7	176	0.065	28.6

KKR-21-033

	Depth	PCB	Cr	Pb	Hg	PAH
581.5	0 - 0.4	0.38	35	140	0.13	99.1
NE	0.4 - 1.2	7.5	80.9	870	0.42	181

KKR-21-038

	Depth	PCB	Cr	Pb	Hg	PAH
571.8	0 - 1	1.2	117	617	0.61	267
NE	1 - 3	1	19.7	68.7	0.041	53.8
	3 - 4.9	6.7	93.1	842	0.63	237

KKM-21-005

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	0.0075	24.4	23.7	0.012	5.1

KKR-20-008

	Depth	PCB	Cr	Pb	Hg	PAH
576.8	0 - 1	57	147	685	1.1	325
9.0	1 - 3	42.7	71.4	483	0.3	268
	3 - 5	23	137	606	0.7	398
	5 - 7	14	193	422	0.59	304
	7 - 9	0.0012	289	282	0.75	117
	9 - 10	0.0022	19.5	26.6	0.12	5.8

KKR-21-031

	Depth	PCB	Cr	Pb	Hg	PAH
569.2	0 - 0.3	0.27	7.3	18.6	0.025	22.2
NE						

KKR-21-037

	Depth	PCB	Cr	Pb	Hg	PAH
573.5	0 - 1	3.5	89.8	571	0.66	322
NE	1 - 3	4.4	109	720	1.4	205
	3 - 5	0.94	151	756	0.83	218
	5 - 6.5	0.097	148	514	0.49	209

KKR-21-036

	Depth	PCB	Cr	Pb	Hg	PAH
580.0	0 - 0.8	0.39	48.9	159	0.16	41.5
NE	0.8 - 1.2	0.19	47.9	216	0.25	62

KKR-21-032

	Depth	PCB	Cr	Pb	Hg	PAH
580.2	0 - 0.7	0.29	97.5	774	0.36	57.7
NE	0.7 - 2	0.22	44.1	106	0.12	59.7

KKR-20-007

	Depth	PCB	Cr	Pb	Hg	PAH
568.3	0 - 1.2	0.21	7.4	23	0.017	28.9
NE						

KKR-21-028

	Depth	PCB	Cr	Pb	Hg	PAH
581.5	0 - 0.8	0.047	30.7	199	0.11	60.7
NE						

KKR-20-006

	Depth	PCB	Cr	Pb	Hg	PAH
574.5	0 - 1	0.053	18	20	0.025	35
NE	1 - 3	0.33	17	31	0.019	40.8
	3 - 5	0.49	8.7	25	0.33	80
	5 - 7.2	4.1	290	430	0.38	270

KKR-21-026

	Depth	PCB	Cr	Pb	Hg	PAH
574.0	0.2 - 1	3.9	92.9	419	0.31	300
NE	1 - 1.7	3.7	116	564	0.28	483

KKR-21-025

	Depth	PCB	Cr	Pb	Hg	PAH
581.6	0 - 1	0.056	61.9	1150	0.28	77.4
NE						

KKR-21-024

	Depth	PCB	Cr	Pb	Hg	PAH
580.9	0 - 0.5	0.0024	31.9	181	0.11	11.4
NE	0.5 - 1.2	0.0019	18.2	66.3	0.052	2.8

KKR-20-005

	Depth	PCB	Cr	Pb	Hg	PAH
575.2	0 - 1	0.27	13	84	0.022	110
NE	1 - 3	0.9	16	59	0.037	49.3
	3 - 5.1	1.5	260	500	0.58	241

KK-SDU13

	Depth	Cr	Pb	Hg	PAH
575.7	0 - 0.3	28	27	0.017	14.1
	0.3 - 2	17	58	0.026	145
	2 - 4	56	310	0.14	224
	4 - 6	120	320	0.3	352
	6 - 8	600	600	0.69	290

LEGEND

- Analytical Sample Location
- Kinnickinnic River Project Area
- Reach 1

Utilities

- Electric
- Fiber Optic
- Gas
- Sanitary Sewer
- Storm Sewer
- Water Line

Kinnickinnic River Reach Areas

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570

N

0 40 80

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Sample interval (ft bss)

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
1 - 3	>PEC	>PEC	>PEC
3 - 5	>3xPEC	>3xPEC	>3xPEC
5 - 50	>5xPEC	>5xPEC	>5xPEC
>50			

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-3B
Analytical Results Summary
Kinnickinnic River - Reach 1
Map 2 of 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

W BECHER ST

Kinnickinnic River

KKR-20-013

	Depth	PCB	Cr	Pb	Hg	PAH
571.1	0 - 1	2.6	55	440	1.7	167
4.6	1 - 3	5.9	76	550	0.41	314
	3 - 4.6	0.33	44	290	0.27	185
	4.6 - 7	0.0016	13	7.5	0.02	0.63

KK-SDU11

	Depth	Cr	Pb	Hg	PAH
576.9	0 - 0.3	40	84	0.035	40.6
	0.3 - 2	46	290	0.21	174
	2 - 4	80	350	0.46	217
	4 - 6	140	450	0.51	229
	6 - 7	230	520	1.1	219

KKR-21-050

	Depth	PCB	Cr	Pb	Hg	PAH
580.2	0 - 1	0.36	46.1	138	0.15	72.7
NE	1 - 3	1.1	125	829	0.46	147
	3 - 5	7.3	103	651	0.66	168
	5 - 6.8	4	62.8	382	0.35	133

KKR-20-012

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	3.7	24	190	0.07	63.1
NE	1 - 3	9.1	47	280	0.27	185
	3 - 5	7.1	93	500	0.49	321
	5 - 7	2.6	140	380	0.55	247
	7 - 8.8	0.57	150	260	1	255

KKR-21-049

	Depth	PCB	Cr	Pb	Hg	PAH
571.7	0 - 0.8	0.46	20	74.5	0.047	194
NE	0.8 - 3	0.3	143	435	0.64	202
	3 - 4.4	0.19	191	362	0.61	142

KKR-20-011

	Depth	PCB	Cr	Pb	Hg	PAH
571.5	0 - 1	0.54	15	510	0.04	46.6
NE	1 - 3	5.3	18	89	1.7	70.4
	3 - 5	10.6	52	330	0.29	194
	5 - 7	4.1	67	390	0.31	51.6
	7 - 9	0.0012	650	280	1.2	220
	9 - 9.9	0.0012	140	130	0.88	25.7

KKR-20-010

	Depth	PCB	Cr	Pb	Hg	PAH
571.8	0 - 1	0.28	22	61	0.031	511
NE	1 - 3	5.5	33	170	0.15	127
	3 - 5	3.8	60	330	0.24	350
	5 - 7	3.4	140	390	0.46	240
	7 - 8	0.0012	570	340	1.7	53.1

KKR-21-048

	Depth	PCB	Cr	Pb	Hg	PAH
571.5	0 - 1	0.5	25.8	36.1	0.021	118
NE	1 - 1.8	0.65	12.8	25.7	0.02	45.1

KKR-21-046

	Depth	PCB	Cr	Pb	Hg	PAH
573.0	0 - 1.3	3.6	17.4	88.4	0.45	68.5
NE	1.3 - 1.8	5.3	51.2	270	0.49	242
	1.8 - 4	2.1	67	407	0.33	191

KKR-21-045

	Depth	PCB	Cr	Pb	Hg	PAH
587.7	0 - 1.3	0.12	17.5	134	0.39	22.3
NE						

KKR-21-044

	Depth	PCB	Cr	Pb	Hg	PAH
591.9	0.2 - 0.9	0.0018	16.4	122	0.075	5.1
NE	0.9 - 1.1	0.018	48.3	347	4.4	59.1

KKR-21-043

	Depth	PCB	Cr	Pb	Hg	PAH
573.7	0 - 1	0.45	17.9	38.1	0.036	121
NE	1 - 3	0.66	39.8	222	0.21	197
	3 - 5	1	136	509	0.52	317
	5 - 5.9	0.21	157	459	0.58	203

KKR-20-009

	Depth	PCB	Cr	Pb	Hg	PAH
573.9	0 - 1.3	0.24	21.7	48	0.03	65.3
3.6	1.3 - 3	2.1	42.1	193	0.18	192
	3 - 5	9.3	84.3	374	0.53	402
	5 - 7	3.3	190	415	0.49	197
	7 - 9	0.82	308	248	1.3	83.5
	9 - 9.9	0.0022	102	94.9	0.85	13.9

KKR-21-042

	Depth	PCB	Cr	Pb	Hg	PAH
581.2	0 - 0.9	0.013	17.4	258	0.031	4.6
NE						

KKR-21-041

	Depth	PCB	Cr	Pb	Hg	PAH
573.6	0 - 1.3	0.29	15.8	82.7	0.045	36.4
NE	1.3 - 2.3	1.3	32.8	258	0.18	112

LEGEND

- Analytical Sample Location
- Kinnickinnic River Project Area

Utilities

- Electric
- Fiber Optic
- Gas
- Sanitary Sewer
- Storm Sewer
- Water Line

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565

N

0 40 80

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

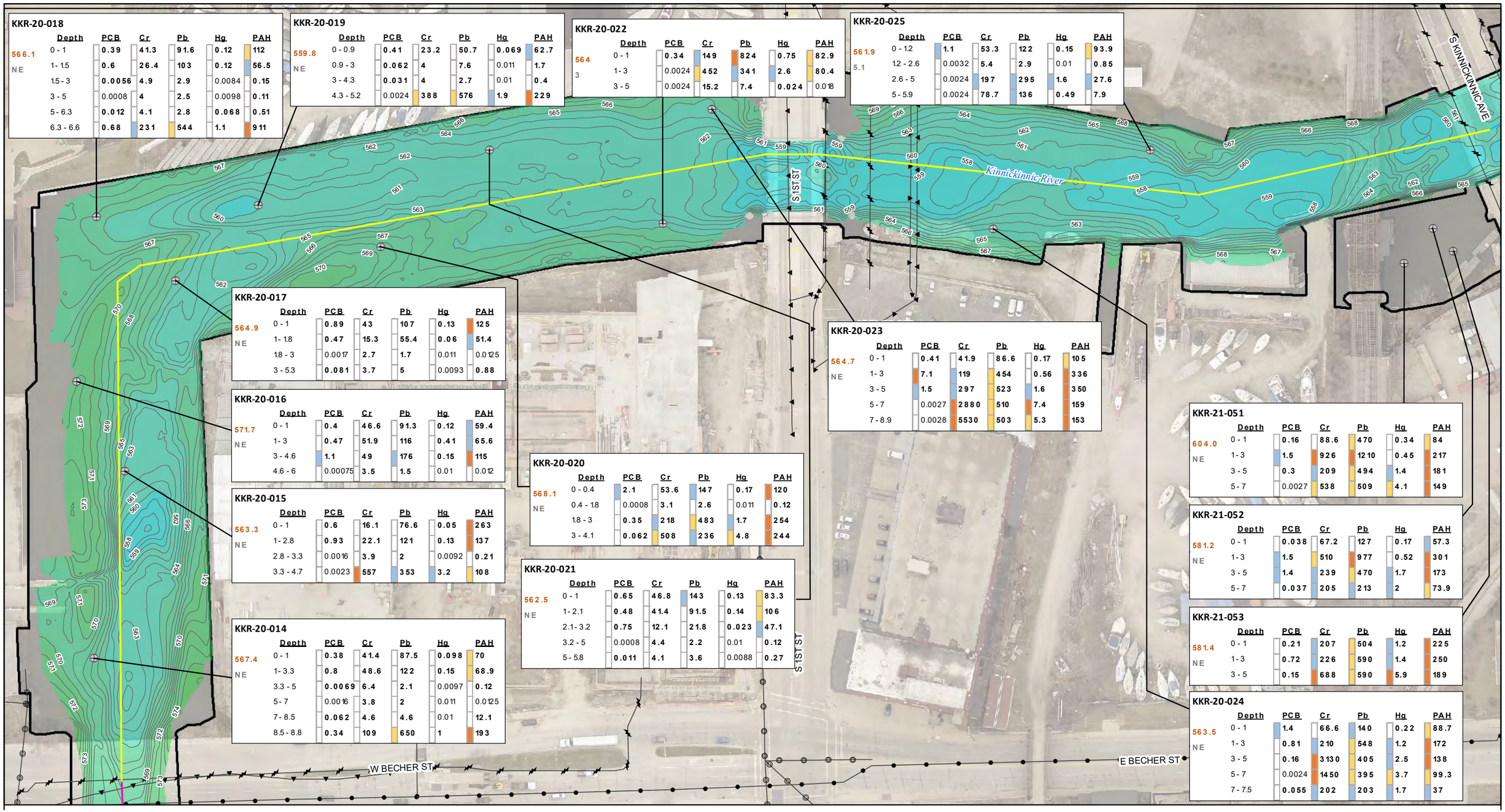
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-3C
Analytical Results Summary
Kinnickinnic River - Reach 1
Map 3 of 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



KKR-20-018

	Depth	PCB	Cr	Pb	Hg	PAH
566.1	0 - 1	0.39	41.3	91.6	0.12	112
NE	1 - 1.5	0.6	26.4	103	0.12	56.5
	1.5 - 3	0.0056	4.9	2.9	0.0084	0.15
	3 - 5	0.0008	4	2.5	0.0098	0.11
	5 - 6.3	0.012	4.1	2.8	0.068	0.51
	6.3 - 6.6	0.68	231	544	1.1	911

KKR-20-019

	Depth	PCB	Cr	Pb	Hg	PAH
559.8	0 - 0.9	0.41	23.2	50.7	0.069	62.7
NE	0.9 - 3	0.062	4	7.6	0.011	1.7
	3 - 4.3	0.031	4	2.7	0.01	0.4
	4.3 - 5.2	0.0024	388	576	1.9	229

KKR-20-022

	Depth	PCB	Cr	Pb	Hg	PAH
564	0 - 1	0.34	149	824	0.75	82.9
3	1 - 3	0.0024	452	341	2.6	80.4
	3 - 5	0.0024	15.2	7.4	0.024	0.018

KKR-20-025

	Depth	PCB	Cr	Pb	Hg	PAH
561.9	0 - 1.2	1.1	53.3	122	0.15	93.9
5.1	1.2 - 2.6	0.0032	5.4	2.9	0.01	0.85
	2.6 - 5	0.0024	197	295	1.6	27.6
	5 - 5.9	0.0024	78.7	136	0.49	7.9

KKR-20-017

	Depth	PCB	Cr	Pb	Hg	PAH
564.9	0 - 1	0.89	43	107	0.13	125
NE	1 - 1.8	0.47	15.3	55.4	0.06	51.4
	1.8 - 3	0.0017	2.7	1.7	0.011	0.0125
	3 - 5.3	0.081	3.7	5	0.0093	0.88

KKR-20-023

	Depth	PCB	Cr	Pb	Hg	PAH
564.7	0 - 1	0.41	41.9	86.6	0.17	105
NE	1 - 3	7.1	119	454	0.56	336
	3 - 5	1.5	297	523	1.6	350
	5 - 7	0.0027	2880	510	7.4	159
	7 - 8.9	0.0028	5530	503	5.3	153

KKR-21-051

	Depth	PCB	Cr	Pb	Hg	PAH
604.0	0 - 1	0.16	88.6	470	0.34	84
NE	1 - 3	1.5	926	1210	0.45	217
	3 - 5	0.3	209	494	1.4	181
	5 - 7	0.0027	538	509	4.1	149

KKR-20-016

	Depth	PCB	Cr	Pb	Hg	PAH
571.7	0 - 1	0.4	46.6	91.3	0.12	59.4
NE	1 - 3	0.47	51.9	116	0.41	65.6
	3 - 4.6	1.1	49	176	0.15	115
	4.6 - 6	0.00075	3.5	1.5	0.01	0.012

KKR-20-020

	Depth	PCB	Cr	Pb	Hg	PAH
568.1	0 - 0.4	2.1	53.6	147	0.17	120
NE	0.4 - 1.8	0.0008	3.1	2.6	0.011	0.12
	1.8 - 3	0.35	218	483	1.7	254
	3 - 4.1	0.062	508	236	4.8	244

KKR-21-052

	Depth	PCB	Cr	Pb	Hg	PAH
581.2	0 - 1	0.038	67.2	127	0.17	57.3
NE	1 - 3	1.5	510	977	0.52	301
	3 - 5	1.4	239	470	1.7	173
	5 - 7	0.037	205	213	2	73.9

KKR-20-015

	Depth	PCB	Cr	Pb	Hg	PAH
563.3	0 - 1	0.6	16.1	76.6	0.05	263
NE	1 - 2.8	0.93	22.1	121	0.13	137
	2.8 - 3.3	0.0016	3.9	2	0.0092	0.21
	3.3 - 4.7	0.0023	557	353	3.2	108

KKR-20-021

	Depth	PCB	Cr	Pb	Hg	PAH
562.5	0 - 1	0.65	46.8	143	0.13	83.3
NE	1 - 2.1	0.48	41.4	91.5	0.14	106
	2.1 - 3.2	0.75	12.1	21.8	0.023	47.1
	3.2 - 5	0.0008	4.4	2.2	0.01	0.12
	5 - 5.8	0.011	4.1	3.6	0.0088	0.27

KKR-21-053

	Depth	PCB	Cr	Pb	Hg	PAH
581.4	0 - 1	0.21	207	504	1.2	225
NE	1 - 3	0.72	226	590	1.4	250
	3 - 5	0.15	688	590	5.9	189

KKR-20-014

	Depth	PCB	Cr	Pb	Hg	PAH
567.4	0 - 1	0.38	41.4	87.5	0.098	70
NE	1 - 3.3	0.8	48.6	122	0.15	68.9
	3.3 - 5	0.0069	6.4	2.1	0.0097	0.12
	5 - 7	0.0016	3.8	2	0.011	0.0125
	7 - 8.5	0.062	4.6	4.6	0.01	12.1
	8.5 - 8.8	0.34	109	650	1	193

KKR-20-024

	Depth	PCB	Cr	Pb	Hg	PAH
563.5	0 - 1	1.4	66.6	140	0.22	88.7
NE	1 - 3	0.81	210	548	1.2	172
	3 - 5	0.16	3130	405	2.5	138
	5 - 7	0.0024	1450	395	3.7	99.3
	7 - 7.5	0.055	202	203	1.7	37

LEGEND

- Analytical Sample Location
- Kinnickinnic River Project Area

Utilities
- Electric
- Fiber Optic
- Sanitary Sewer
- Storm Sewer
- Water Line

Kinnickinnic River Reach Areas
- Reach 1
- Reach 2
- Reach 3

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560

N

0 50 100

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-4
Analytical Results Summary
Kinnickinnic River - Reach 2
Map 1 of 1
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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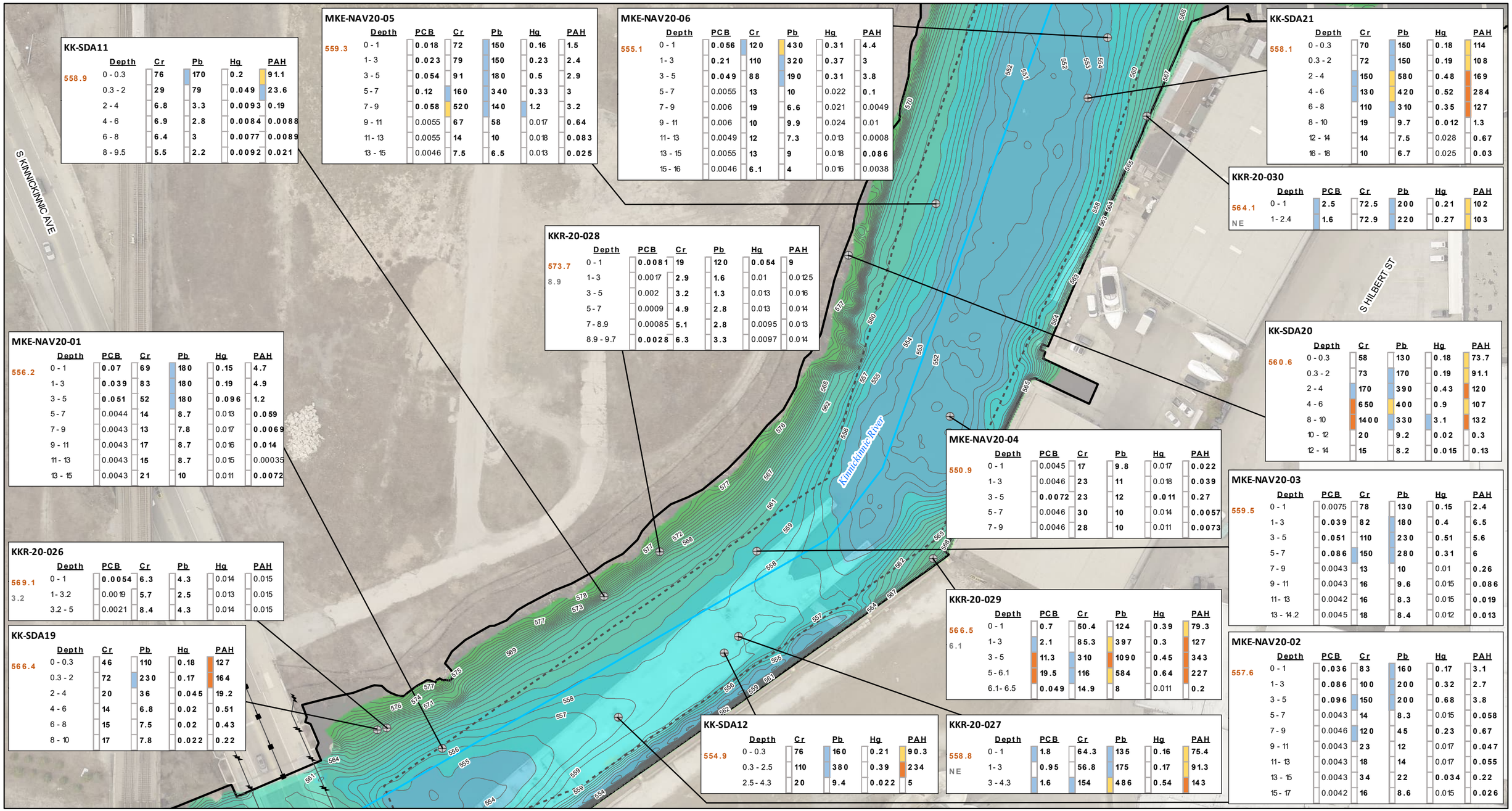


KK-SDA11

	Depth	Cr	Pb	Hg	PAH
558.9	0 - 0.3	76	170	0.2	91.1
	0.3 - 2	29	79	0.049	23.6
	2 - 4	6.8	3.3	0.0093	0.19
	4 - 6	6.9	2.8	0.0084	0.0088
	6 - 8	6.4	3	0.0077	0.0089
	8 - 9.5	5.5	2.2	0.0092	0.021

MKE-NAV20-05

	Depth	PCB	Cr	Pb	Hg	PAH
559.3	0 - 1	0.018	72	150	0.16	1.5
	1 - 3	0.023	79	150	0.23	2.4
	3 - 5	0.054	91	180	0.5	2.9
	5 - 7	0.12	160	340	0.33	3
	7 - 9	0.058	520	140	1.2	3.2
	9 - 11	0.0055	67	58	0.017	0.64
	11 - 13	0.0055	14	10	0.018	0.083
	13 - 15	0.0046	7.5	6.5	0.013	0.025

MKE-NAV20-06

	Depth	PCB	Cr	Pb	Hg	PAH
555.1	0 - 1	0.056	120	430	0.31	4.4
	1 - 3	0.21	110	320	0.37	3
	3 - 5	0.049	88	190	0.31	3.8
	5 - 7	0.0055	13	10	0.022	0.1
	7 - 9	0.006	19	6.6	0.021	0.0049
	9 - 11	0.006	10	9.9	0.024	0.01
	11 - 13	0.0049	12	7.3	0.013	0.0008
	13 - 15	0.0055	13	9	0.018	0.086
	15 - 16	0.0046	6.1	4	0.016	0.0038

KK-SDA21

	Depth	Cr	Pb	Hg	PAH
558.1	0 - 0.3	70	150	0.18	114
	0.3 - 2	72	150	0.19	108
	2 - 4	150	580	0.48	169
	4 - 6	130	420	0.52	284
	6 - 8	110	310	0.35	127
	8 - 10	19	9.7	0.012	1.3
	12 - 14	14	7.5	0.028	0.67
	16 - 18	10	6.7	0.025	0.03

KKR-20-030

	Depth	PCB	Cr	Pb	Hg	PAH
564.1 NE	0 - 1	2.5	72.5	200	0.21	102
	1 - 2.4	1.6	72.9	220	0.27	103

KKR-20-028

	Depth	PCB	Cr	Pb	Hg	PAH
573.7 8.9	0 - 1	0.0081	19	120	0.054	9
	1 - 3	0.0017	2.9	1.6	0.01	0.0125
	3 - 5	0.002	3.2	1.3	0.013	0.016
	5 - 7	0.0009	4.9	2.8	0.013	0.014
	7 - 8.9	0.00085	5.1	2.8	0.0095	0.013
	8.9 - 9.7	0.0028	6.3	3.3	0.0097	0.014

KK-SDA20

	Depth	Cr	Pb	Hg	PAH
560.6	0 - 0.3	58	130	0.18	73.7
	0.3 - 2	73	170	0.19	91.1
	2 - 4	170	390	0.43	120
	4 - 6	650	400	0.9	107
	8 - 10	1400	330	3.1	132
	10 - 12	20	9.2	0.02	0.3
	12 - 14	15	8.2	0.015	0.13

MKE-NAV20-01

	Depth	PCB	Cr	Pb	Hg	PAH
556.2	0 - 1	0.07	69	180	0.15	4.7
	1 - 3	0.039	83	180	0.19	4.9
	3 - 5	0.051	52	180	0.096	1.2
	5 - 7	0.0044	14	8.7	0.013	0.059
	7 - 9	0.0043	13	7.8	0.017	0.0069
	9 - 11	0.0043	17	8.7	0.016	0.014
	11 - 13	0.0043	15	8.7	0.015	0.00035
	13 - 15	0.0043	21	10	0.011	0.0072

MKE-NAV20-04

	Depth	PCB	Cr	Pb	Hg	PAH
550.9	0 - 1	0.0045	17	9.8	0.017	0.022
	1 - 3	0.0046	23	11	0.018	0.039
	3 - 5	0.0072	23	12	0.011	0.27
	5 - 7	0.0046	30	10	0.014	0.0057
	7 - 9	0.0046	28	10	0.011	0.0073

MKE-NAV20-03

	Depth	PCB	Cr	Pb	Hg	PAH
559.5	0 - 1	0.0075	78	130	0.15	2.4
	1 - 3	0.039	82	180	0.4	6.5
	3 - 5	0.051	110	230	0.51	5.6
	5 - 7	0.086	150	280	0.31	6
	7 - 9	0.0043	13	10	0.01	0.26
	9 - 11	0.0043	16	9.6	0.015	0.086
	11 - 13	0.0042	16	8.3	0.015	0.019
	13 - 14.2	0.0045	18	8.4	0.012	0.013

KKR-20-026

	Depth	PCB	Cr	Pb	Hg	PAH
569.1 3.2	0 - 1	0.0054	6.3	4.3	0.014	0.015
	1 - 3.2	0.0019	5.7	2.5	0.013	0.015
	3.2 - 5	0.0021	8.4	4.3	0.014	0.015

KKR-20-029

	Depth	PCB	Cr	Pb	Hg	PAH
566.5 6.1	0 - 1	0.7	50.4	124	0.39	79.3
	1 - 3	2.1	85.3	397	0.3	127
	3 - 5	11.3	310	1090	0.45	343
	5 - 6.1	19.5	116	584	0.64	227
	6.1 - 6.5	0.049	14.9	8	0.011	0.2

KK-SDA19

	Depth	Cr	Pb	Hg	PAH
566.4	0 - 0.3	46	110	0.18	127
	0.3 - 2	72	230	0.17	164
	2 - 4	20	36	0.045	19.2
	4 - 6	14	6.8	0.02	0.51
	6 - 8	15	7.5	0.02	0.43
	8 - 10	17	7.8	0.022	0.22

KK-SDA12

	Depth	Cr	Pb	Hg	PAH
554.9	0 - 0.3	76	160	0.21	90.3
	0.3 - 2.5	110	380	0.39	234
	2.5 - 4.3	20	9.4	0.022	5

KKR-20-027

	Depth	PCB	Cr	Pb	Hg	PAH
558.8 NE	0 - 1	1.8	64.3	135	0.16	75.4
	1 - 3	0.95	56.8	175	0.17	91.3
	3 - 4.3	1.6	154	486	0.54	143

MKE-NAV20-02

	Depth	PCB	Cr	Pb	Hg	PAH
557.6	0 - 1	0.036	83	160	0.17	3.1
	1 - 3	0.086	100	200	0.32	2.7
	3 - 5	0.096	150	200	0.68	3.8
	5 - 7	0.0043	14	8.3	0.015	0.058
	7 - 9	0.0046	120	45	0.23	0.67
	9 - 11	0.0043	23	12	0.017	0.047
	11 - 13	0.0043	18	14	0.017	0.055
	13 - 15	0.0043	34	22	0.034	0.22
	15 - 17	0.0042	16	8.6	0.015	0.026

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities

- Electric
- Storm Sewer

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

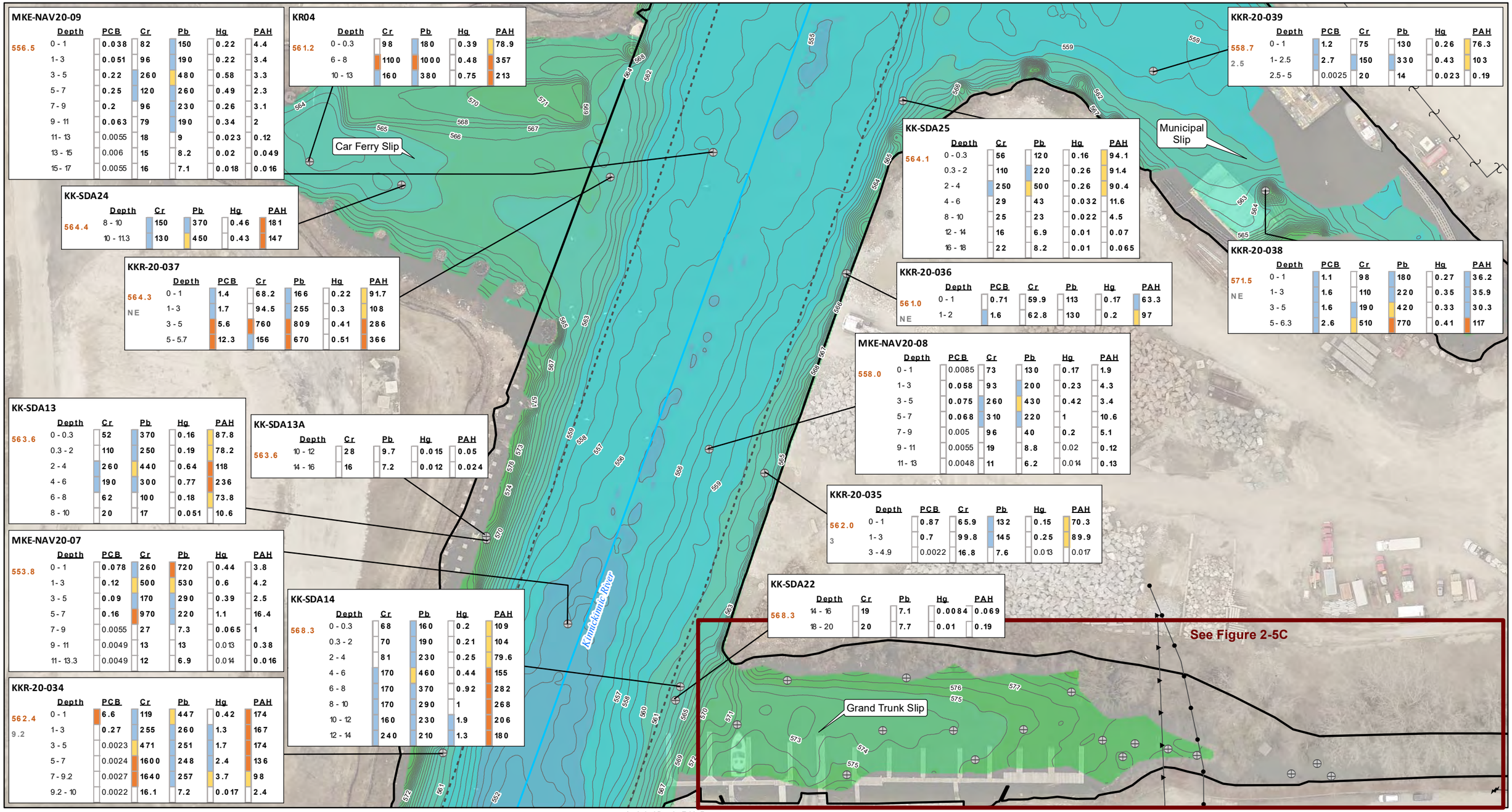
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-5A
Analytical Results Summary
Kinnickinnic River - Reach 3
Map 1 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



MKE-NAV20-09

	Depth	PCB	Cr	Pb	Hg	PAH
556.5	0 - 1	0.038	82	150	0.22	4.4
	1 - 3	0.051	96	190	0.22	3.4
	3 - 5	0.22	260	480	0.58	3.3
	5 - 7	0.25	120	260	0.49	2.3
	7 - 9	0.2	96	230	0.26	3.1
	9 - 11	0.063	79	190	0.34	2
	11 - 13	0.0055	18	9	0.023	0.12
	13 - 15	0.006	15	8.2	0.02	0.049
	15 - 17	0.0055	16	7.1	0.018	0.016

KR04

	Depth	Cr	Pb	Hg	PAH
561.2	0 - 0.3	98	180	0.39	78.9
	6 - 8	1100	1000	0.48	357
	10 - 13	160	380	0.75	213

KKR-20-039

	Depth	PCB	Cr	Pb	Hg	PAH
558.7	0 - 1	1.2	75	130	0.26	76.3
2.5	1 - 2.5	2.7	150	330	0.43	103
	2.5 - 5	0.0025	20	14	0.023	0.19

KK-SDA25

	Depth	Cr	Pb	Hg	PAH
564.1	0 - 0.3	56	120	0.16	94.1
	0.3 - 2	110	220	0.26	91.4
	2 - 4	250	500	0.26	90.4
	4 - 6	29	43	0.032	11.6
	8 - 10	25	23	0.022	4.5
	12 - 14	16	6.9	0.01	0.07
	16 - 18	22	8.2	0.01	0.065

KK-SDA24

	Depth	Cr	Pb	Hg	PAH
564.4	8 - 10	150	370	0.46	181
	10 - 11.3	130	450	0.43	147

KKR-20-037

	Depth	PCB	Cr	Pb	Hg	PAH
564.3	0 - 1	1.4	68.2	166	0.22	91.7
NE	1 - 3	1.7	94.5	255	0.3	108
	3 - 5	5.6	760	809	0.41	286
	5 - 5.7	12.3	156	670	0.51	366

KKR-20-036

	Depth	PCB	Cr	Pb	Hg	PAH
561.0	0 - 1	0.71	59.9	113	0.17	63.3
NE	1 - 2	1.6	62.8	130	0.2	97

KKR-20-038

	Depth	PCB	Cr	Pb	Hg	PAH
571.5	0 - 1	1.1	98	180	0.27	36.2
NE	1 - 3	1.6	110	220	0.35	35.9
	3 - 5	1.6	190	420	0.33	30.3
	5 - 6.3	2.6	510	770	0.41	117

MKE-NAV20-08

	Depth	PCB	Cr	Pb	Hg	PAH
558.0	0 - 1	0.0085	73	130	0.17	1.9
	1 - 3	0.058	93	200	0.23	4.3
	3 - 5	0.075	260	430	0.42	3.4
	5 - 7	0.068	310	220	1	10.6
	7 - 9	0.005	96	40	0.2	5.1
	9 - 11	0.0055	19	8.8	0.02	0.12
	11 - 13	0.0048	11	6.2	0.014	0.13

KK-SDA13

	Depth	Cr	Pb	Hg	PAH
563.6	0 - 0.3	52	370	0.16	87.8
	0.3 - 2	110	250	0.19	78.2
	2 - 4	260	440	0.64	118
	4 - 6	190	300	0.77	236
	6 - 8	62	100	0.18	73.8
	8 - 10	20	17	0.051	10.6

KK-SDA13A

	Depth	Cr	Pb	Hg	PAH
563.6	10 - 12	28	9.7	0.015	0.05
	14 - 16	16	7.2	0.012	0.024

KKR-20-035

	Depth	PCB	Cr	Pb	Hg	PAH
562.0	0 - 1	0.87	65.9	132	0.15	70.3
3	1 - 3	0.7	99.8	145	0.25	89.9
	3 - 4.9	0.0022	16.8	7.6	0.013	0.017

MKE-NAV20-07

	Depth	PCB	Cr	Pb	Hg	PAH
553.8	0 - 1	0.078	260	720	0.44	3.8
	1 - 3	0.12	500	530	0.6	4.2
	3 - 5	0.09	170	290	0.39	2.5
	5 - 7	0.16	970	220	1.1	16.4
	7 - 9	0.0055	27	7.3	0.065	1
	9 - 11	0.0049	13	13	0.013	0.38
	11 - 13.3	0.0049	12	6.9	0.014	0.016

KK-SDA14

	Depth	Cr	Pb	Hg	PAH
568.3	0 - 0.3	68	160	0.2	109
	0.3 - 2	70	190	0.21	104
	2 - 4	81	230	0.25	79.6
	4 - 6	170	460	0.44	155
	6 - 8	170	370	0.92	282
	8 - 10	170	290	1	268
	10 - 12	160	230	1.9	206
	12 - 14	240	210	1.3	180

KK-SDA22

	Depth	Cr	Pb	Hg	PAH
568.3	14 - 16	19	7.1	0.0084	0.069
	18 - 20	20	7.7	0.01	0.19

KKR-20-034

	Depth	PCB	Cr	Pb	Hg	PAH
562.4	0 - 1	6.6	119	447	0.42	174
9.2	1 - 3	0.27	255	260	1.3	167
	3 - 5	0.0023	471	251	1.7	174
	5 - 7	0.0024	1600	248	2.4	136
	7 - 9.2	0.0027	1640	257	3.7	98
	9.2 - 10	0.0022	16.1	7.2	0.017	2.4

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities

- Electric
- Gas
- Sanitary Sewer
- Water Line

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-5B
Analytical Results Summary
Kinnickinnic River - Reach 3
Map 2 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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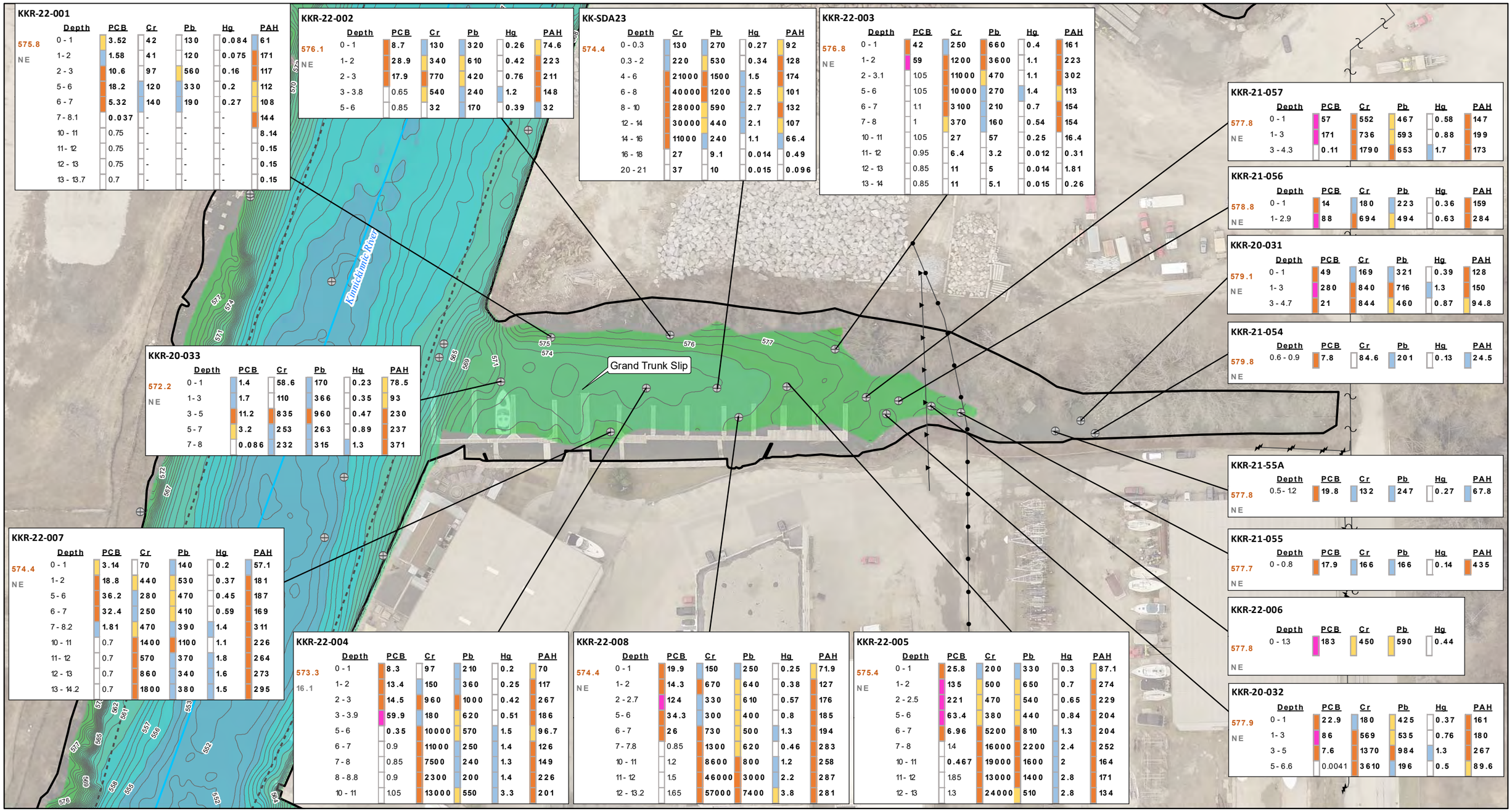

KKR-22-001

	Depth	PCB	Cr	Pb	Hg	PAH
575.8	0 - 1	3.52	42	130	0.084	61
NE	1 - 2	1.58	41	120	0.075	171
	2 - 3	10.6	97	560	0.16	117
	5 - 6	18.2	120	330	0.2	112
	6 - 7	5.32	140	190	0.27	108
	7 - 8.1	0.037	-	-	-	144
	10 - 11	0.75	-	-	-	8.14
	11 - 12	0.75	-	-	-	0.15
	12 - 13	0.75	-	-	-	0.15
	13 - 13.7	0.7	-	-	-	0.15

KKR-22-002

	Depth	PCB	Cr	Pb	Hg	PAH
576.1	0 - 1	8.7	130	320	0.26	74.6
NE	1 - 2	28.9	340	610	0.42	223
	2 - 3	17.9	770	420	0.76	211
	3 - 3.8	0.65	540	240	1.2	148
	5 - 6	0.85	32	170	0.39	32

KK-SDA23

	Depth	Cr	Pb	Hg	PAH
574.4	0 - 0.3	130	270	0.27	92
	0.3 - 2	220	530	0.34	128
	4 - 6	21000	1500	1.5	174
	6 - 8	40000	1200	2.5	101
	8 - 10	28000	590	2.7	132
	12 - 14	30000	440	2.1	107
	14 - 16	11000	240	1.1	66.4
	16 - 18	27	9.1	0.014	0.49
	20 - 21	37	10	0.015	0.096

KKR-22-003

	Depth	PCB	Cr	Pb	Hg	PAH
576.8	0 - 1	42	250	660	0.4	161
NE	1 - 2	59	1200	3600	1.1	223
	2 - 3.1	1.05	11000	470	1.1	302
	5 - 6	1.05	10000	270	1.4	113
	6 - 7	1.1	3100	210	0.7	154
	7 - 8	1	370	160	0.54	154
	10 - 11	1.05	27	57	0.25	16.4
	11 - 12	0.95	6.4	3.2	0.012	0.31
	12 - 13	0.85	11	5	0.014	1.81
	13 - 14	0.85	11	5.1	0.015	0.26

KKR-21-057

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1	57	552	467	0.58	147
NE	1 - 3	171	736	593	0.88	199
	3 - 4.3	0.11	1790	653	1.7	173

KKR-21-056

	Depth	PCB	Cr	Pb	Hg	PAH
578.8	0 - 1	14	180	223	0.36	159
NE	1 - 2.9	88	694	494	0.63	284

KKR-20-031

	Depth	PCB	Cr	Pb	Hg	PAH
579.1	0 - 1	49	169	321	0.39	128
NE	1 - 3	280	840	716	1.3	150
	3 - 4.7	21	844	460	0.87	94.8

KKR-21-054

	Depth	PCB	Cr	Pb	Hg	PAH
579.8	0.6 - 0.9	7.8	84.6	201	0.13	24.5
NE						

KKR-20-033

	Depth	PCB	Cr	Pb	Hg	PAH
572.2	0 - 1	1.4	58.6	170	0.23	78.5
NE	1 - 3	1.7	110	366	0.35	93
	3 - 5	11.2	835	960	0.47	230
	5 - 7	3.2	253	263	0.89	237
	7 - 8	0.086	232	315	1.3	371

KKR-21-55A

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0.5 - 1.2	19.8	132	247	0.27	67.8
NE						

KKR-22-007

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	3.14	70	140	0.2	57.1
NE	1 - 2	18.8	440	530	0.37	181
	5 - 6	36.2	280	470	0.45	187
	6 - 7	32.4	250	410	0.59	169
	7 - 8.2	1.81	470	390	1.4	311
	10 - 11	0.7	1400	1100	1.1	226
	11 - 12	0.7	570	370	1.8	264
	12 - 13	0.7	860	340	1.6	273
	13 - 14.2	0.7	1800	380	1.5	295

KKR-21-055

	Depth	PCB	Cr	Pb	Hg	PAH
577.7	0 - 0.8	17.9	166	166	0.14	435
NE						

KKR-22-004

	Depth	PCB	Cr	Pb	Hg	PAH
573.3	0 - 1	8.3	97	210	0.2	70
16.1	1 - 2	13.4	150	360	0.25	117
	2 - 3	14.5	960	1000	0.42	267
	3 - 3.9	59.9	180	620	0.51	186
	5 - 6	0.35	10000	570	1.5	96.7
	6 - 7	0.9	11000	250	1.4	126
	7 - 8	0.85	7500	240	1.3	149
	8 - 8.8	0.9	2300	200	1.4	226
	10 - 11	1.05	13000	550	3.3	201

KKR-22-008

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	19.9	150	250	0.25	71.9
NE	1 - 2	14.3	670	640	0.38	127
	2 - 2.7	124	330	610	0.57	176
	5 - 6	34.3	300	400	0.8	185
	6 - 7	26	730	500	1.3	194
	7 - 7.8	0.85	1300	620	0.46	283
	10 - 11	1.2	8600	800	1.2	258
	11 - 12	1.5	46000	3000	2.2	287
	12 - 13.2	1.65	57000	7400	3.8	281

KKR-22-005

	Depth	PCB	Cr	Pb	Hg	PAH
575.4	0 - 1	25.8	200	330	0.3	87.1
NE	1 - 2	135	500	650	0.7	274
	2 - 2.5	221	470	540	0.65	229
	5 - 6	63.4	380	440	0.84	204
	6 - 7	6.96	5200	810	1.3	204
	7 - 8	1.4	16000	2200	2.4	252
	10 - 11	0.467	19000	1600	2	164
	11 - 12	1.85	13000	1400	2.8	171
	12 - 13	1.3	24000	510	2.8	134

KKR-22-006

	Depth	PCB	Cr	Pb	Hg
577.8	0 - 1.3	183	450	590	0.44
NE					

KKR-20-032

	Depth	PCB	Cr	Pb	Hg	PAH
577.9	0 - 1	22.9	180	425	0.37	161
NE	1 - 3	86	569	535	0.76	180
	3 - 5	7.6	1370	984	1.3	267
	5 - 6.6	0.0041	3610	196	0.5	89.6

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities

- Electric
- Gas
- Sanitary Sewer
- Water Line

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-5C
Analytical Results Summary
Kinnickinnic River - Grand Trunk Detail
Reach 3 - Map 3 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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KR01

	Depth	Cr	Pb	Hg	PAH
562.3	0 - 0.3	96	160	0.26	116
	4 - 6	120	300	0.34	251
	8 - 10	270	170	0.67	409

KR02

	Depth	Cr	Pb	Hg	PAH
565.3	0 - 0.3	90	180	0.23	136
	6 - 8	79	170	0.22	126
	8 - 10	130	210	0.47	271
	10 - 11.7	190	96	1	163

KKR-20-042

	Depth	PCB	Cr	Pb	Hg	PAH
562.8	0 - 1	1.2	83.4	189	0.24	103
NE	1 - 3	1.3	135	263	0.27	107
	3 - 4.2	3.2	210	410	0.33	162

MKE-NAV20-11

	Depth	PCB	Cr	Pb	Hg	PAH
557.5	0 - 1	0.0065	110	180	0.3	1.1
	1 - 3	0.1	170	260	0.5	4.2
	3 - 5	0.048	320	180	0.62	4.5
	5 - 7	0.045	330	450	0.51	5.3
	7 - 9	0.068	30	59	0.27	8.2
	9 - 11	0.0055	22	10	0.031	0.11
	11 - 13	0.006	21	9.7	0.029	0.001
	13 - 15	0.006	33	12	0.028	0.001
	15 - 17	0.006	19	9.6	0.026	0.0024

KK-SDA26

	Depth	Cr	Pb	Hg	PAH
562.7	14 - 16	27	9.8	0.02	0.26
	16 - 18.2	10	5	0.025	0.5

KR03

	Depth	Cr	Pb	Hg	PAH
562.5	0 - 0.3	75	170	0.2	151
	6 - 8	130	210	0.34	240
	10 - 12	500	110	1.5	793

KK-SDA15

	Depth	Cr	Pb	Hg	PAH
561.4	0 - 0.3	93	180	0.21	74.8
	0.3 - 2	84	270	0.34	-
	2 - 4	67	160	0.23	213
	4 - 6	98	200	0.3	263
	6 - 8	120	240	0.58	385
	8 - 10	1200	300	3.2	2700
	10 - 11.5	270	59	0.78	350

KKR-20-043

	Depth	PCB	Cr	Pb	Hg	PAH
562.6	0 - 1	4.6	290	520	0.4	180
5.1	1 - 3	6	330	470	0.45	226
	3 - 5.1	7.5	78	210	0.36	203
	5.1 - 7.1	0.0027	14	6.2	0.02	0.38

MKE-NAV20-12A

	Depth	PCB	Cr	Pb	Hg	PAH
555.5	0 - 1	0.047	280	360	0.41	1.6

MKE-NAV20-12B

	Depth	PCB	Cr	Pb	Hg	PAH
553.2	0 - 1	0.047	230	340	0.61	8.5
	1 - 3	0.023	180	270	0.22	1.1
	3 - 5	0.006	32	30	0.032	0.24
	5 - 7	0.006	21	11	0.028	0.053
	7 - 9	0.006	21	10	0.026	0.021
	9 - 11	0.0065	19	9.7	0.027	0.0026
	11 - 12.8	0.0055	12	8.9	0.021	0.0023

KK-SDA16A

	Depth	Cr	Pb	Hg	PAH
562.9	0 - 0.3	85	150	0.23	87.9
	0.3 - 2	180	320	0.34	115
	2 - 4	540	640	0.52	220
	4 - 6	200	410	0.49	96
	6 - 8	23	18	0.028	20.9

KKR-20-041

	Depth	PCB	Cr	Pb	Hg	PAH
560.3	0 - 1	1.9	83	180	0.026	70.5
NE	1 - 3.3	3.1	160	420	0.43	111

MKE-NAV20-10

	Depth	PCB	Cr	Pb	Hg	PAH
554.5	0 - 1	0.025	100	180	0.26	3.4
	1 - 3	0.075	140	210	0.27	4
	3 - 5	0.055	190	360	0.43	3.9
	5 - 7	0.026	420	320	0.069	1.9
	7 - 9	0.006	22	10	0.028	0.12
	9 - 11	0.006	27	12	0.031	0.035
	11 - 13.5	0.006	14	9.4	0.026	0.047

KKR-20-040

	Depth	PCB	Cr	Pb	Hg	PAH
558.6	0 - 1	1	71	130	0.26	54.2
4.6	1 - 3	1.4	83	170	0.29	78
	3 - 4.6	2.8	200	440	0.57	115
	4.6 - 7	0.0024	18	8	0.022	0.19

Municipal Slip

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities
- Gas

Kinnickinnic River Reach Areas
- Reach 3

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

	Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth		<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

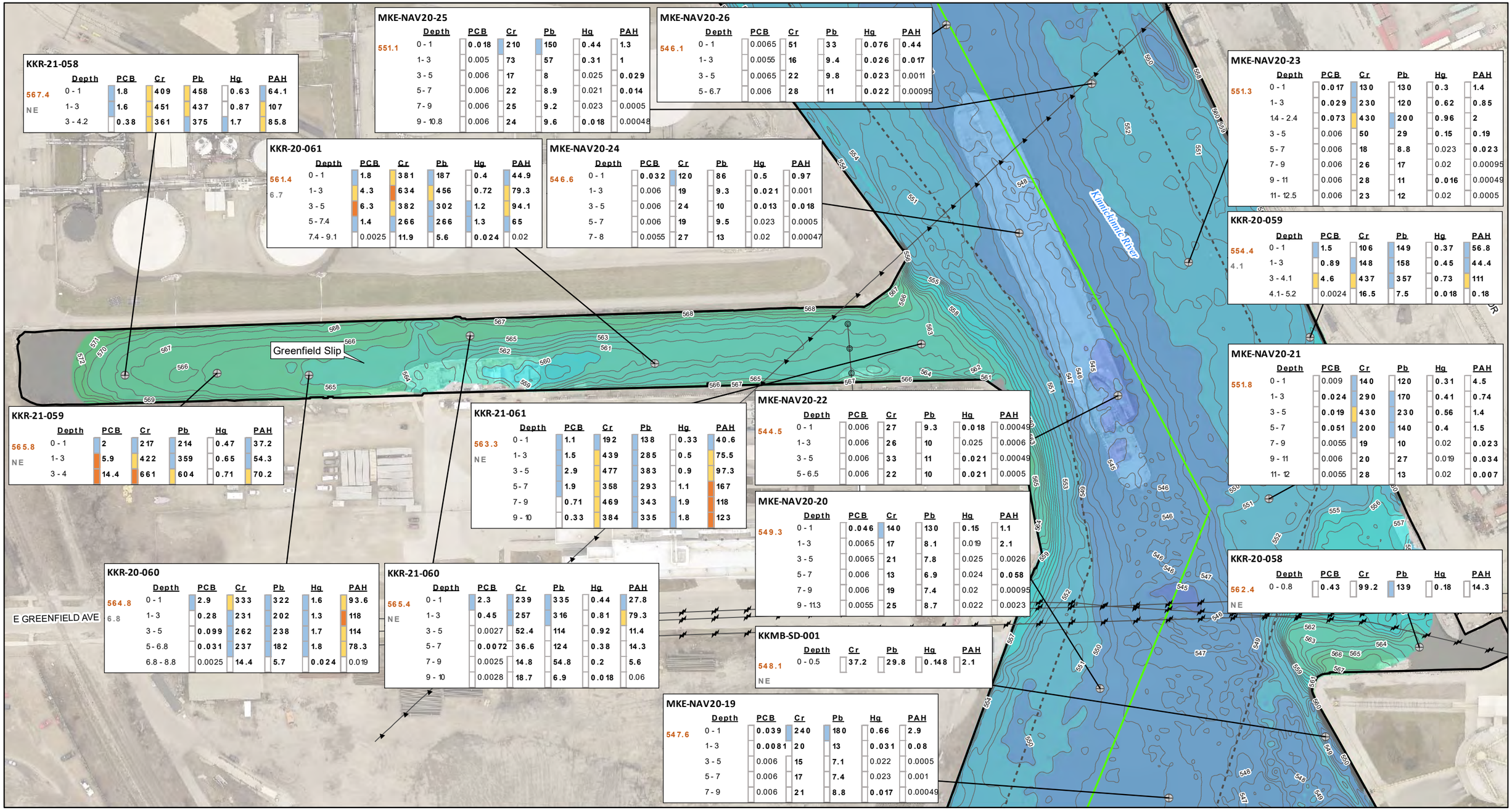
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-5D
Analytical Results Summary
Kinnickinnic River - Reach 3
Map 4 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



KKR-21-058

	Depth	PCB	Cr	Pb	Hg	PAH
567.4	0 - 1	1.8	409	458	0.63	64.1
NE	1 - 3	1.6	451	437	0.87	107
	3 - 4.2	0.38	361	375	1.7	85.8

MKE-NAV20-25

	Depth	PCB	Cr	Pb	Hg	PAH
551.1	0 - 1	0.018	210	150	0.44	1.3
	1 - 3	0.005	73	57	0.31	1
	3 - 5	0.006	17	8	0.025	0.029
	5 - 7	0.006	22	8.9	0.021	0.014
	7 - 9	0.006	25	9.2	0.023	0.0005
	9 - 10.8	0.006	24	9.6	0.018	0.00048

MKE-NAV20-26

	Depth	PCB	Cr	Pb	Hg	PAH
546.1	0 - 1	0.0065	51	33	0.076	0.44
	1 - 3	0.0055	16	9.4	0.026	0.017
	3 - 5	0.0065	22	9.8	0.023	0.0011
	5 - 6.7	0.006	28	11	0.022	0.00095

MKE-NAV20-23

	Depth	PCB	Cr	Pb	Hg	PAH
551.3	0 - 1	0.017	130	130	0.3	1.4
	1 - 3	0.029	230	120	0.62	0.85
	1.4 - 2.4	0.073	430	200	0.96	2
	3 - 5	0.006	50	29	0.15	0.19
	5 - 7	0.006	18	8.8	0.023	0.023
	7 - 9	0.006	26	17	0.02	0.00095
	9 - 11	0.006	28	11	0.016	0.00049
	11 - 12.5	0.006	23	12	0.02	0.0005

KKR-20-061

	Depth	PCB	Cr	Pb	Hg	PAH
561.4	0 - 1	1.8	381	187	0.4	44.9
6.7	1 - 3	4.3	634	456	0.72	79.3
	3 - 5	6.3	382	302	1.2	94.1
	5 - 7.4	1.4	266	266	1.3	65
	7.4 - 9.1	0.0025	11.9	5.6	0.024	0.02

MKE-NAV20-24

	Depth	PCB	Cr	Pb	Hg	PAH
546.6	0 - 1	0.032	120	86	0.5	0.97
	1 - 3	0.006	19	9.3	0.021	0.001
	3 - 5	0.006	24	10	0.013	0.018
	5 - 7	0.006	19	9.5	0.023	0.0005
	7 - 8	0.0055	27	13	0.02	0.00047

KKR-20-059

	Depth	PCB	Cr	Pb	Hg	PAH
554.4	0 - 1	1.5	106	149	0.37	56.8
4.1	1 - 3	0.89	148	158	0.45	44.4
	3 - 4.1	4.6	437	357	0.73	111
	4.1 - 5.2	0.0024	16.5	7.5	0.018	0.18

KKR-21-059

	Depth	PCB	Cr	Pb	Hg	PAH
565.8	0 - 1	2	217	214	0.47	37.2
NE	1 - 3	5.9	422	359	0.65	54.3
	3 - 4	14.4	661	604	0.71	70.2

KKR-21-061

	Depth	PCB	Cr	Pb	Hg	PAH
563.3	0 - 1	1.1	192	138	0.33	40.6
NE	1 - 3	1.5	439	285	0.5	75.5
	3 - 5	2.9	477	383	0.9	97.3
	5 - 7	1.9	358	293	1.1	167
	7 - 9	0.71	469	343	1.9	118
	9 - 10	0.33	384	335	1.8	123

MKE-NAV20-22

	Depth	PCB	Cr	Pb	Hg	PAH
544.5	0 - 1	0.006	27	9.3	0.018	0.00049
	1 - 3	0.006	26	10	0.025	0.0006
	3 - 5	0.006	33	11	0.021	0.00049
	5 - 6.5	0.006	22	10	0.021	0.0005

MKE-NAV20-21

	Depth	PCB	Cr	Pb	Hg	PAH
551.8	0 - 1	0.009	140	120	0.31	4.5
	1 - 3	0.024	290	170	0.41	0.74
	3 - 5	0.019	430	230	0.56	1.4
	5 - 7	0.051	200	140	0.4	1.5
	7 - 9	0.0055	19	10	0.02	0.023
	9 - 11	0.006	20	27	0.019	0.034
	11 - 12	0.0055	28	13	0.02	0.007

MKE-NAV20-20

	Depth	PCB	Cr	Pb	Hg	PAH
549.3	0 - 1	0.046	140	130	0.15	1.1
	1 - 3	0.0065	17	8.1	0.019	2.1
	3 - 5	0.0065	21	7.8	0.025	0.0026
	5 - 7	0.006	13	6.9	0.024	0.058
	7 - 9	0.006	19	7.4	0.02	0.00095
	9 - 11.3	0.0055	25	8.7	0.022	0.0023

KKR-20-058

	Depth	PCB	Cr	Pb	Hg	PAH
562.4	0 - 0.8	0.43	99.2	139	0.18	14.3
NE						

KKR-20-060

	Depth	PCB	Cr	Pb	Hg	PAH
564.8	0 - 1	2.9	333	322	1.6	93.6
6.8	1 - 3	0.28	231	202	1.3	118
	3 - 5	0.099	262	238	1.7	114
	5 - 6.8	0.031	237	182	1.8	78.3
	6.8 - 8.8	0.0025	14.4	5.7	0.024	0.019

KKR-21-060

	Depth	PCB	Cr	Pb	Hg	PAH
565.4	0 - 1	2.3	239	335	0.44	27.8
NE	1 - 3	0.45	257	316	0.81	79.3
	3 - 5	0.0027	52.4	114	0.92	11.4
	5 - 7	0.0072	36.6	124	0.38	14.3
	7 - 9	0.0025	14.8	54.8	0.2	5.6
	9 - 10	0.0028	18.7	6.9	0.018	0.06

KKMB-SD-001

	Depth	Cr	Pb	Hg	PAH
548.1	0 - 0.5	37.2	29.8	0.148	2.1
NE					

MKE-NAV20-19

	Depth	PCB	Cr	Pb	Hg	PAH
547.6	0 - 1	0.039	240	180	0.66	2.9
	1 - 3	0.0081	20	13	0.031	0.08
	3 - 5	0.006	15	7.1	0.022	0.0005
	5 - 7	0.006	17	7.4	0.023	0.001
	7 - 9	0.006	21	8.8	0.017	0.00049

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities
- Electric
- Fiber Optic
- Sanitary Sewer

Kinnickinnic River Reach Areas
- Reach 4

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
<1	<PEC	<PEC	<PEC
Sample interval (ft bss): 1 - 3	>PEC	>PEC	>PEC
3 - 5	>3xPEC	>3xPEC	>3xPEC
5 - 50	>5xPEC	>5xPEC	
>50			

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-6A
Analytical Results Summary
Kinnickinnic River- - Reach 4
Map 1 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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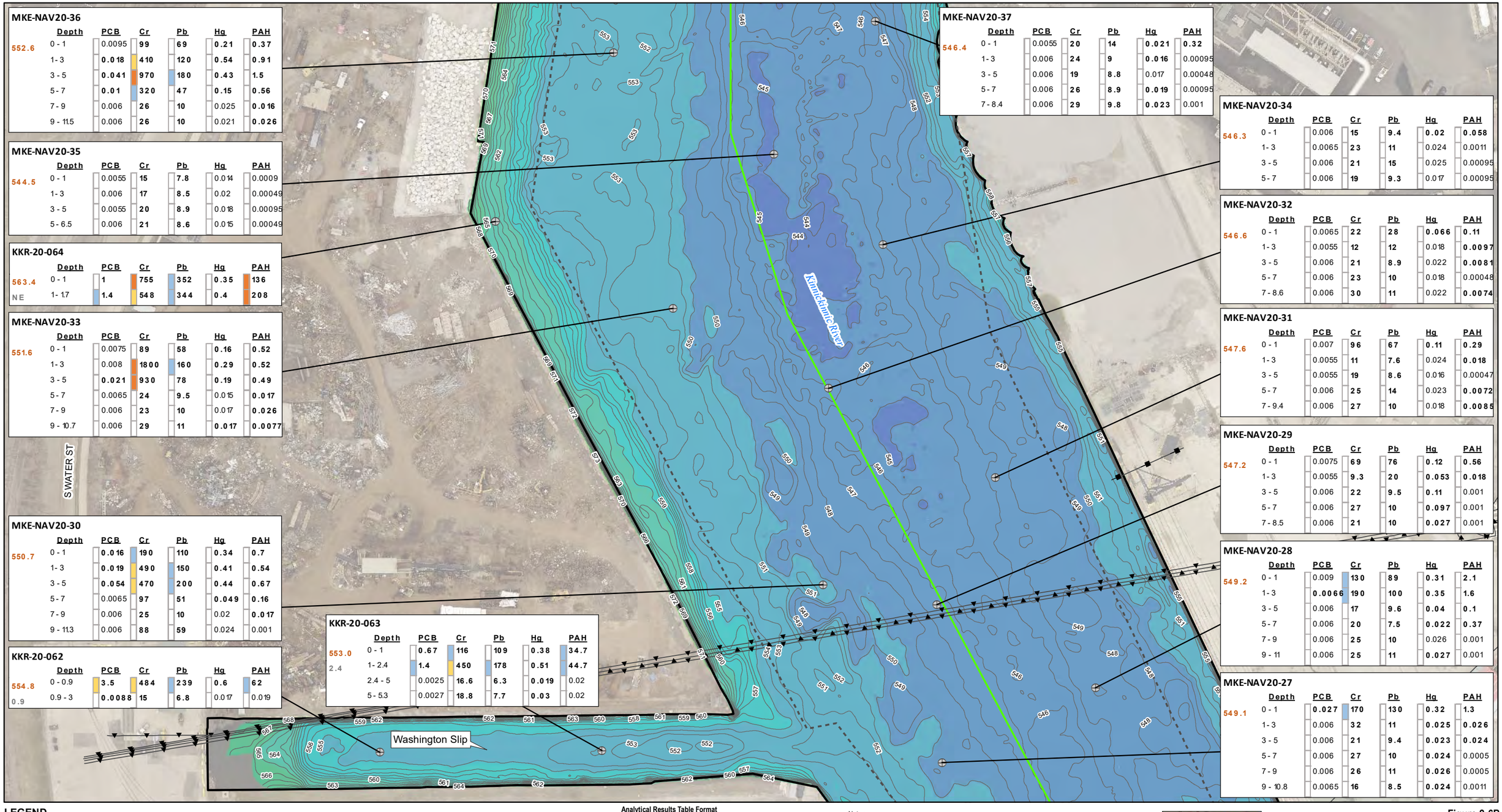


MKE-NAV20-36

	Depth	PCB	Cr	Pb	Hg	PAH
552.6	0 - 1	0.0095	99	69	0.21	0.37
	1 - 3	0.018	410	120	0.54	0.91
	3 - 5	0.041	970	180	0.43	1.5
	5 - 7	0.01	320	47	0.15	0.56
	7 - 9	0.006	26	10	0.025	0.016
	9 - 11.5	0.006	26	10	0.021	0.026

MKE-NAV20-35

	Depth	PCB	Cr	Pb	Hg	PAH
544.5	0 - 1	0.0055	15	7.8	0.014	0.0009
	1 - 3	0.006	17	8.5	0.02	0.00049
	3 - 5	0.0055	20	8.9	0.018	0.00095
	5 - 6.5	0.006	21	8.6	0.015	0.00049

KKR-20-064

	Depth	PCB	Cr	Pb	Hg	PAH
563.4	0 - 1	1	755	352	0.35	136
NE	1 - 1.7	1.4	548	344	0.4	208

MKE-NAV20-33

	Depth	PCB	Cr	Pb	Hg	PAH
551.6	0 - 1	0.0075	89	58	0.16	0.52
	1 - 3	0.008	1800	160	0.29	0.52
	3 - 5	0.021	930	78	0.19	0.49
	5 - 7	0.0065	24	9.5	0.015	0.017
	7 - 9	0.006	23	10	0.017	0.026
	9 - 10.7	0.006	29	11	0.017	0.0077

MKE-NAV20-30

	Depth	PCB	Cr	Pb	Hg	PAH
550.7	0 - 1	0.016	190	110	0.34	0.7
	1 - 3	0.019	490	150	0.41	0.54
	3 - 5	0.054	470	200	0.44	0.67
	5 - 7	0.0065	97	51	0.049	0.16
	7 - 9	0.006	25	10	0.02	0.017
	9 - 11.3	0.006	88	59	0.024	0.001

KKR-20-062

	Depth	PCB	Cr	Pb	Hg	PAH
554.8	0 - 0.9	3.5	484	239	0.6	62
0.9	0.9 - 3	0.0088	15	6.8	0.017	0.019

KKR-20-063

	Depth	PCB	Cr	Pb	Hg	PAH
553.0	0 - 1	0.67	116	109	0.38	34.7
2.4	1 - 2.4	1.4	450	178	0.51	44.7
	2.4 - 5	0.0025	16.6	6.3	0.019	0.02
	5 - 5.3	0.0027	18.8	7.7	0.03	0.02

MKE-NAV20-37

	Depth	PCB	Cr	Pb	Hg	PAH
546.4	0 - 1	0.0055	20	14	0.021	0.32
	1 - 3	0.006	24	9	0.016	0.00095
	3 - 5	0.006	19	8.8	0.017	0.00048
	5 - 7	0.006	26	8.9	0.019	0.00095
	7 - 8.4	0.006	29	9.8	0.023	0.001

MKE-NAV20-34

	Depth	PCB	Cr	Pb	Hg	PAH
546.3	0 - 1	0.006	15	9.4	0.02	0.058
	1 - 3	0.0065	23	11	0.024	0.0011
	3 - 5	0.006	21	15	0.025	0.00095
	5 - 7	0.006	19	9.3	0.017	0.00095

MKE-NAV20-32

	Depth	PCB	Cr	Pb	Hg	PAH
546.6	0 - 1	0.0065	22	28	0.066	0.11
	1 - 3	0.0055	12	12	0.018	0.0097
	3 - 5	0.006	21	8.9	0.022	0.0081
	5 - 7	0.006	23	10	0.018	0.00048
	7 - 8.6	0.006	30	11	0.022	0.0074

MKE-NAV20-31

	Depth	PCB	Cr	Pb	Hg	PAH
547.6	0 - 1	0.007	96	67	0.11	0.29
	1 - 3	0.0055	11	7.6	0.024	0.018
	3 - 5	0.0055	19	8.6	0.016	0.00047
	5 - 7	0.006	25	14	0.023	0.0072
	7 - 9.4	0.006	27	10	0.018	0.0085

MKE-NAV20-29

	Depth	PCB	Cr	Pb	Hg	PAH
547.2	0 - 1	0.0075	69	76	0.12	0.56
	1 - 3	0.0055	9.3	20	0.053	0.018
	3 - 5	0.006	22	9.5	0.11	0.001
	5 - 7	0.006	27	10	0.097	0.001
	7 - 8.5	0.006	21	10	0.027	0.001

MKE-NAV20-28

	Depth	PCB	Cr	Pb	Hg	PAH
549.2	0 - 1	0.009	130	89	0.31	2.1
	1 - 3	0.0066	190	100	0.35	1.6
	3 - 5	0.006	17	9.6	0.04	0.1
	5 - 7	0.006	20	7.5	0.022	0.37
	7 - 9	0.006	25	10	0.026	0.001
	9 - 11	0.006	25	11	0.027	0.001

MKE-NAV20-27

	Depth	PCB	Cr	Pb	Hg	PAH
549.1	0 - 1	0.027	170	130	0.32	1.3
	1 - 3	0.006	32	11	0.025	0.026
	3 - 5	0.006	21	9.4	0.023	0.024
	5 - 7	0.006	27	10	0.024	0.0005
	7 - 9	0.006	26	11	0.026	0.0005
	9 - 10.8	0.0065	16	8.5	0.024	0.0011

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities
- Sanitary Sewer
- Storm Sewer

Kinnickinnic River Reach Areas
- Reach 4

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

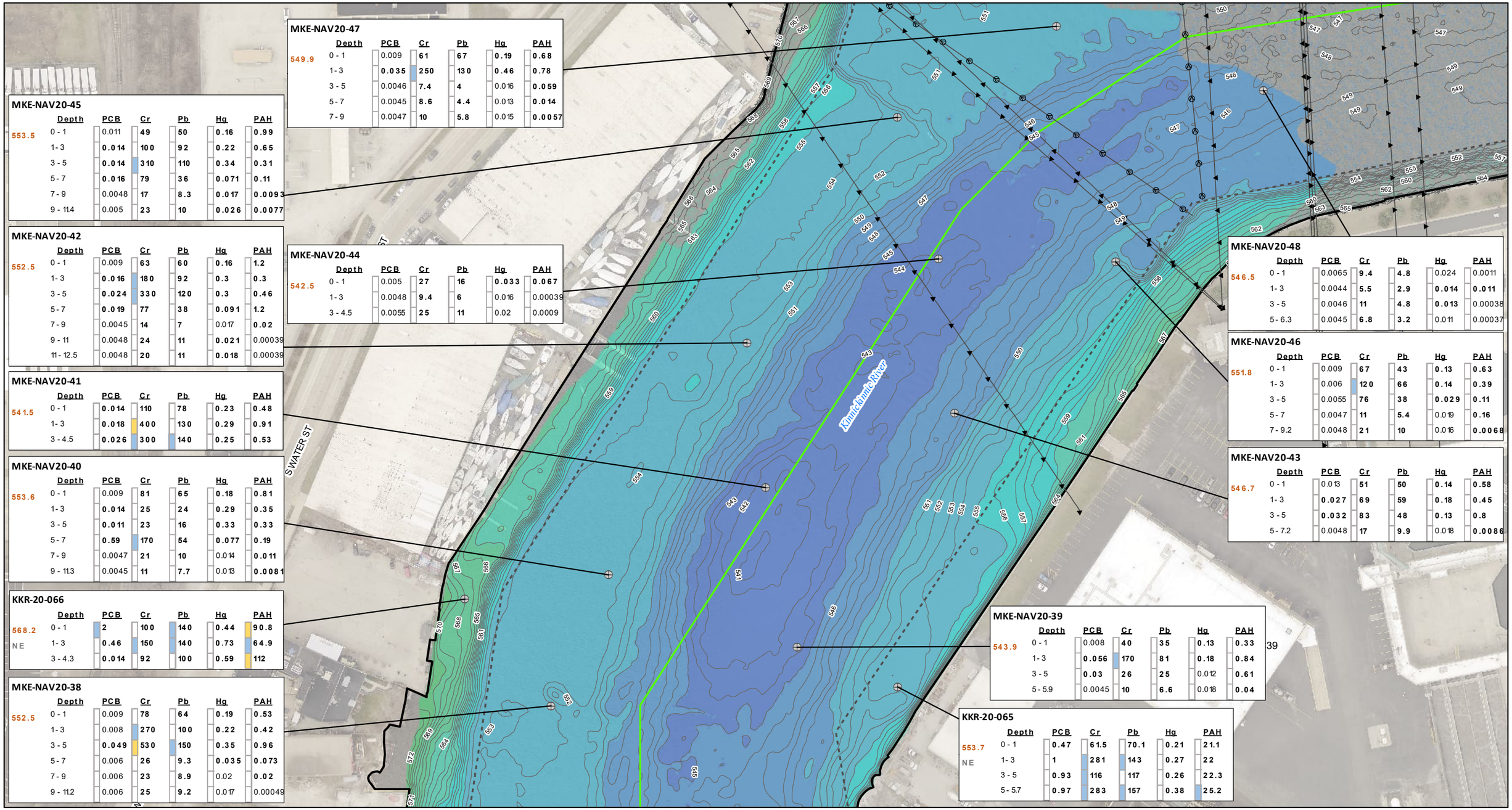
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PCB = polychlorinated biphenyl; PAHs = polycyclic aromatic hydrocarbons; Pb = lead; PEC = Probable effects concentration

Figure 2-6B
Analytical Results Summary
Kinnickinnic River - Reach 4
Map 2 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



MKE-NAV20-47

	Depth	PCB	Cr	Pb	Hg	PAH
549.9	0 - 1	0.009	61	67	0.19	0.68
	1 - 3	0.035	250	130	0.46	0.78
	3 - 5	0.0046	7.4	4	0.016	0.059
	5 - 7	0.0045	8.6	4.4	0.013	0.014
	7 - 9	0.0047	10	5.8	0.015	0.0057

MKE-NAV20-45

	Depth	PCB	Cr	Pb	Hg	PAH
553.5	0 - 1	0.011	49	50	0.16	0.99
	1 - 3	0.014	100	92	0.22	0.65
	3 - 5	0.014	310	110	0.34	0.31
	5 - 7	0.016	79	36	0.071	0.11
	7 - 9	0.0048	17	8.3	0.017	0.0093
	9 - 11.4	0.005	23	10	0.026	0.0077

MKE-NAV20-44

	Depth	PCB	Cr	Pb	Hg	PAH
542.5	0 - 1	0.005	27	16	0.033	0.067
	1 - 3	0.0048	9.4	6	0.016	0.00039
	3 - 4.5	0.0055	25	11	0.02	0.0009

MKE-NAV20-48

	Depth	PCB	Cr	Pb	Hg	PAH
546.5	0 - 1	0.0065	9.4	4.8	0.024	0.0011
	1 - 3	0.0044	5.5	2.9	0.014	0.011
	3 - 5	0.0046	11	4.8	0.013	0.00038
	5 - 6.3	0.0045	6.8	3.2	0.011	0.00037

MKE-NAV20-42

	Depth	PCB	Cr	Pb	Hg	PAH
552.5	0 - 1	0.009	63	60	0.16	1.2
	1 - 3	0.016	180	92	0.3	0.3
	3 - 5	0.024	330	120	0.3	0.46
	5 - 7	0.019	77	38	0.091	1.2
	7 - 9	0.0045	14	7	0.017	0.02
	9 - 11	0.0048	24	11	0.021	0.00039
	11 - 12.5	0.0048	20	11	0.018	0.00039

MKE-NAV20-46

	Depth	PCB	Cr	Pb	Hg	PAH
551.8	0 - 1	0.009	67	43	0.13	0.63
	1 - 3	0.006	120	66	0.14	0.39
	3 - 5	0.0055	76	38	0.029	0.11
	5 - 7	0.0047	11	5.4	0.019	0.16
	7 - 9.2	0.0048	21	10	0.016	0.0068

MKE-NAV20-41

	Depth	PCB	Cr	Pb	Hg	PAH
541.5	0 - 1	0.014	110	78	0.23	0.48
	1 - 3	0.018	400	130	0.29	0.91
	3 - 4.5	0.026	300	140	0.25	0.53

MKE-NAV20-43

	Depth	PCB	Cr	Pb	Hg	PAH
546.7	0 - 1	0.013	51	50	0.14	0.58
	1 - 3	0.027	69	59	0.18	0.45
	3 - 5	0.032	83	48	0.13	0.8
	5 - 7.2	0.0048	17	9.9	0.018	0.0086

MKE-NAV20-40

	Depth	PCB	Cr	Pb	Hg	PAH
553.6	0 - 1	0.009	81	65	0.18	0.81
	1 - 3	0.014	25	24	0.29	0.35
	3 - 5	0.011	23	16	0.33	0.33
	5 - 7	0.59	170	54	0.077	0.19
	7 - 9	0.0047	21	10	0.014	0.011
	9 - 11.3	0.0045	11	7.7	0.013	0.0081

KKR-20-066

	Depth	PCB	Cr	Pb	Hg	PAH
568.2	0 - 1	2	100	140	0.44	90.8
NE	1 - 3	0.46	150	140	0.73	64.9
	3 - 4.3	0.014	92	100	0.59	112

MKE-NAV20-39

	Depth	PCB	Cr	Pb	Hg	PAH
543.9	0 - 1	0.008	40	35	0.13	0.33
	1 - 3	0.056	170	81	0.18	0.84
	3 - 5	0.03	26	25	0.012	0.61
	5 - 5.9	0.0045	10	6.6	0.018	0.04

MKE-NAV20-38

	Depth	PCB	Cr	Pb	Hg	PAH
552.5	0 - 1	0.009	78	64	0.19	0.53
	1 - 3	0.008	270	100	0.22	0.42
	3 - 5	0.049	530	150	0.35	0.96
	5 - 7	0.006	26	9.3	0.035	0.073
	7 - 9	0.006	23	8.9	0.02	0.02
	9 - 11.2	0.006	25	9.2	0.017	0.00049

KKR-20-065

	Depth	PCB	Cr	Pb	Hg	PAH
553.7	0 - 1	0.47	61.5	70.1	0.21	21.1
NE	1 - 3	1	281	143	0.27	22
	3 - 5	0.93	116	117	0.26	22.3
	5 - 5.7	0.97	283	157	0.38	25.2

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project

Utilities

- Sanitary Sewer Utility Identified during Menomonee and Milwaukee River FFS

Kinnickinnic River Reach Areas

- Reach 4

Bathymetry (feet)

- Bathymetric Contour
- 540 - 545

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
<1	<PEC	<PEC	<PEC
Sample interval (ft bss) 1 - 3	>PEC	>PEC	>PEC
3 - 5	>3xPEC	>3xPEC	>3xPEC
5 - 50	>5xPEC	>5xPEC	>5xPEC
>50			

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; FFS = Focused Feasibility Study; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration
6. Bathymetric surface point data provided by Seaworks within portions of this figure extent contained gaps and therefore the derived colored shading is not continuous.

Figure 2-6C
Analytical Results Summary
Kinnickinnic River - Reach 4
Map 3 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-21-062

	Depth	PCB	Cr	Pb	Hg	PAH
568.2	0 - 1	0.94	189	149	0.45	51.7
NE	1- 3	1.3	188	215	0.68	130
	3 - 5	0.088	38.8	93.3	0.23	36
	5 - 7	0.021	16.8	42.3	0.07	31.5
	7 - 7.4	0.0081	8	25.7	0.033	13.5

MKE-NAV20-49

	Depth	PCB	Cr	Pb	Hg	PAH
549.8	0 - 1	0.0085	100	100	0.23	0.32
	1- 3	0.034	200	140	0.5	0.68
	3 - 5	0.054	460	200	0.63	2.3
	5 - 7	0.15	350	170	0.39	1.2
	7 - 9	0.0045	11	6.3	0.017	0.00037

MKE-NAV20-50

	Depth	PCB	Cr	Pb	Hg	PAH
549.9	0 - 1	0.017	71	67	0.04	1.4
	1- 3	0.007	100	91	0.023	0.33
	3 - 5	0.006	15	6.6	0.021	0.038
	5 - 7	0.006	14	6.5	0.015	0.038
	7 - 9	0.0045	4.2	2	0.012	0.00037

KKR-20-067

	Depth	PCB	Cr	Pb	Hg	PAH
566.5	0 - 1	0.15	193	183	0.77	215
NE	1- 3	0.0012	181	192	0.78	525
	3 - 5	0.017	153	273	0.86	1060
	5 - 6.5	0.0044	127	205	0.76	91.8

MKE-NAV20-47

	Depth	PCB	Cr	Pb	Hg	PAH
549.9	0 - 1	0.009	61	67	0.19	0.68
	1- 3	0.035	250	130	0.46	0.78
	3 - 5	0.0046	7.4	4	0.016	0.059
	5 - 7	0.0045	8.6	4.4	0.013	0.014
	7 - 9	0.0047	10	5.8	0.015	0.00057

KKR-20-068

	Depth	PCB	Cr	Pb	Hg	PAH
547.1	0 - 1.3	0.11	29.9	23.2	0.061	4.7
1.3	1.3 - 2.1	0.0023	19.3	9	0.022	0.19

KKR-20-069

	Depth	PCB	Cr	Pb	Hg	PAH
547.4	0 - 0.3	0.42	40.6	52.5	0.12	24.5
0.3	0.3 - 1.2	0.0009	13.5	6.8	0.014	0.014

MKE-NAV20-48

	Depth	PCB	Cr	Pb	Hg	PAH
546.5	0 - 1	0.0065	9.4	4.8	0.024	0.0011
	1- 3	0.0044	5.5	2.9	0.014	0.011
	3 - 5	0.0046	11	4.8	0.013	0.00038
	5 - 6.3	0.0045	6.8	3.2	0.011	0.00037

MKE-NAV20-44

	Depth	PCB	Cr	Pb	Hg	PAH
542.5	0 - 1	0.005	27	16	0.033	0.067
	1- 3	0.0048	9.4	6	0.016	0.00039
	3 - 4.5	0.0055	25	11	0.02	0.0009

MKE-NAV20-46

	Depth	PCB	Cr	Pb	Hg	PAH
551.8	0 - 1	0.009	67	43	0.13	0.63
	1- 3	0.006	120	66	0.14	0.39
	3 - 5	0.0055	76	38	0.029	0.11
	5 - 7	0.0047	11	5.4	0.019	0.16
	7 - 9.2	0.0048	21	10	0.016	0.0068

MKE-NAV20-45

	Depth	PCB	Cr	Pb	Hg	PAH
553.5	0 - 1	0.011	49	50	0.16	0.99
	1- 3	0.014	100	92	0.22	0.65
	3 - 5	0.014	310	110	0.34	0.31
	5 - 7	0.016	79	36	0.071	0.11
	7 - 9	0.0048	17	8.3	0.017	0.0093
	9 - 11.4	0.005	23	10	0.026	0.0077

Milwaukee River

Kinnickinnic River

E ERIE ST

794

LEGEND

- Results also included on the adjoining figure
- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project

Utilities

- Sanitary Sewer
- Storm Sewer
- Utility Identified during Menomonee and Milwaukee River FFS
- Water Line

Kinnickinnic River Reach Areas

- Reach 4

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; FFS = Focused Feasibility Study; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAHs = polycyclic aromatic hydrocarbons; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration
6. Bathymetric surface point data provided by Seaworks within portions of this figure extent contained gaps and therefore the derived colored shading is not continuous.

Figure 2-6D
Analytical Results Summary
Kinnickinnic River - Reach 4
Map 4 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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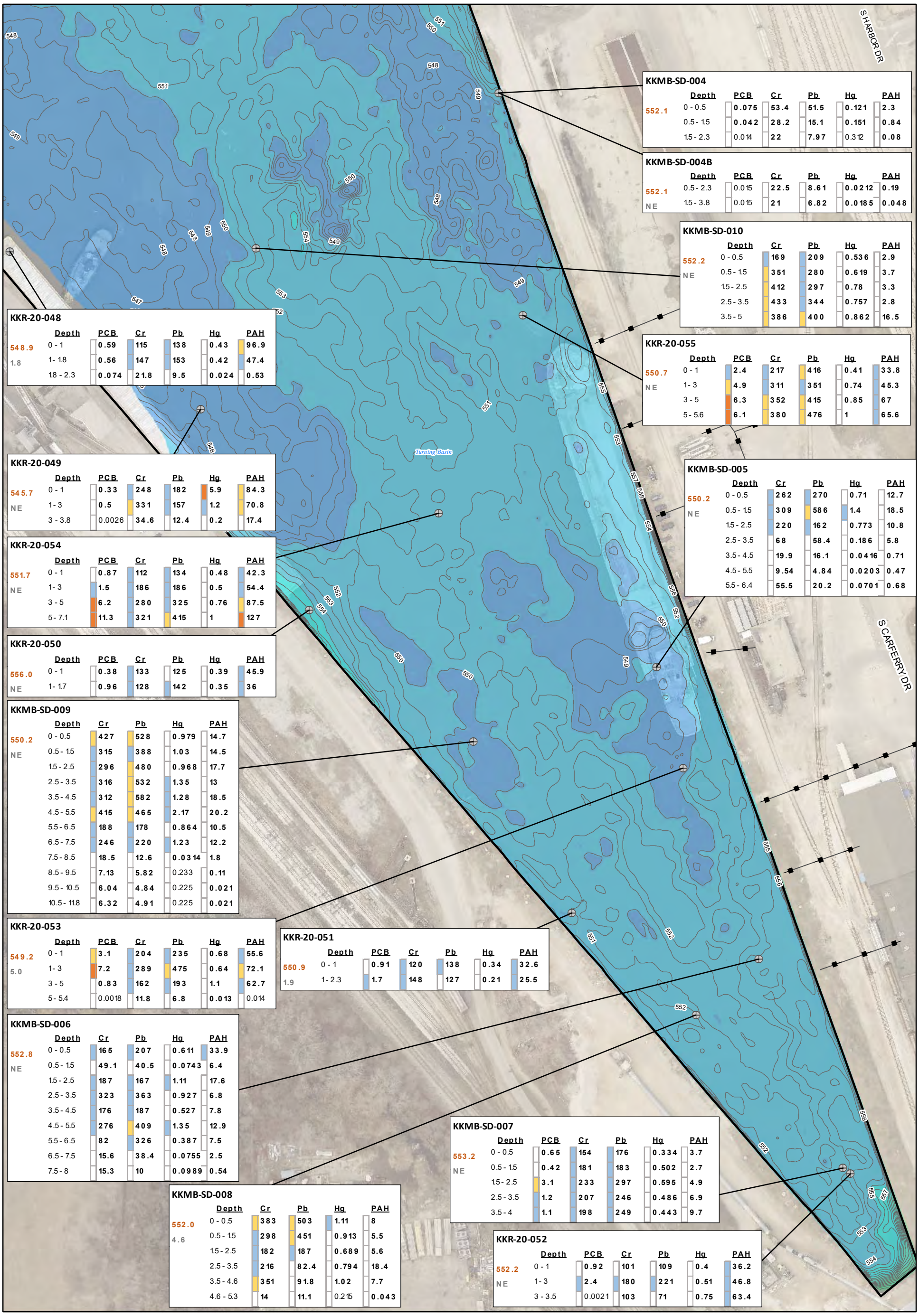


KKMB-SD-004

	Depth	PCB	Cr	Pb	Hg	PAH
552.1	0 - 0.5	0.075	53.4	51.5	0.121	2.3
	0.5 - 1.5	0.042	28.2	15.1	0.151	0.84
	1.5 - 2.3	0.014	22	7.97	0.312	0.08

KKMB-SD-004B

	Depth	PCB	Cr	Pb	Hg	PAH
552.1	0.5 - 2.3	0.015	22.5	8.61	0.0212	0.19
NE	1.5 - 3.8	0.015	21	6.82	0.0185	0.048

KKMB-SD-010

	Depth	Cr	Pb	Hg	PAH
552.2	0 - 0.5	169	209	0.536	2.9
NE	0.5 - 1.5	351	280	0.619	3.7
	1.5 - 2.5	412	297	0.78	3.3
	2.5 - 3.5	433	344	0.757	2.8
	3.5 - 5	386	400	0.862	16.5

KKR-20-055

	Depth	PCB	Cr	Pb	Hg	PAH
550.7	0 - 1	2.4	217	416	0.41	33.8
NE	1 - 3	4.9	311	351	0.74	45.3
	3 - 5	6.3	352	415	0.85	67
	5 - 5.6	6.1	380	476	1	65.6

KKR-20-048

	Depth	PCB	Cr	Pb	Hg	PAH
548.9	0 - 1	0.59	115	138	0.43	96.9
1.8	1 - 1.8	0.56	147	153	0.42	47.4
	1.8 - 2.3	0.074	21.8	9.5	0.024	0.53

KKMB-SD-005

	Depth	Cr	Pb	Hg	PAH
550.2	0 - 0.5	262	270	0.71	12.7
NE	0.5 - 1.5	309	586	1.4	18.5
	1.5 - 2.5	220	162	0.773	10.8
	2.5 - 3.5	68	58.4	0.186	5.8
	3.5 - 4.5	19.9	16.1	0.0416	0.71
	4.5 - 5.5	9.54	4.84	0.0203	0.47
	5.5 - 6.4	55.5	20.2	0.0701	0.68

KKR-20-049

	Depth	PCB	Cr	Pb	Hg	PAH
545.7	0 - 1	0.33	248	182	5.9	84.3
NE	1 - 3	0.5	331	157	1.2	70.8
	3 - 3.8	0.0026	34.6	12.4	0.2	17.4

KKR-20-054

	Depth	PCB	Cr	Pb	Hg	PAH
551.7	0 - 1	0.87	112	134	0.48	42.3
NE	1 - 3	1.5	186	186	0.5	54.4
	3 - 5	6.2	280	325	0.76	87.5
	5 - 7.1	11.3	321	415	1	127

KKR-20-050

	Depth	PCB	Cr	Pb	Hg	PAH
556.0	0 - 1	0.38	133	125	0.39	45.9
NE	1 - 1.7	0.96	128	142	0.35	36

KKMB-SD-009

	Depth	Cr	Pb	Hg	PAH
550.2	0 - 0.5	427	528	0.979	14.7
NE	0.5 - 1.5	315	388	1.03	14.5
	1.5 - 2.5	296	480	0.968	17.7
	2.5 - 3.5	316	532	1.35	13
	3.5 - 4.5	312	582	1.28	18.5
	4.5 - 5.5	415	465	2.17	20.2
	5.5 - 6.5	188	178	0.864	10.5
	6.5 - 7.5	246	220	1.23	12.2
	7.5 - 8.5	18.5	12.6	0.0314	1.8
	8.5 - 9.5	7.13	5.82	0.233	0.11
	9.5 - 10.5	6.04	4.84	0.225	0.021
	10.5 - 11.8	6.32	4.91	0.225	0.021

KKR-20-053

	Depth	PCB	Cr	Pb	Hg	PAH
549.2	0 - 1	3.1	204	235	0.68	55.6
5.0	1 - 3	7.2	289	475	0.64	72.1
	3 - 5	0.83	162	193	1.1	62.7
	5 - 5.4	0.0018	11.8	6.8	0.013	0.014

KKR-20-051

	Depth	PCB	Cr	Pb	Hg	PAH
550.9	0 - 1	0.91	120	138	0.34	32.6
1.9	1 - 2.3	1.7	148	127	0.21	25.5

KKMB-SD-006

	Depth	Cr	Pb	Hg	PAH
552.8	0 - 0.5	165	207	0.611	33.9
NE	0.5 - 1.5	49.1	40.5	0.0743	6.4
	1.5 - 2.5	187	167	1.11	17.6
	2.5 - 3.5	323	363	0.927	6.8
	3.5 - 4.5	176	187	0.527	7.8
	4.5 - 5.5	276	409	1.35	12.9
	5.5 - 6.5	82	326	0.387	7.5
	6.5 - 7.5	15.6	38.4	0.0755	2.5
	7.5 - 8	15.3	10	0.0989	0.54

KKMB-SD-007

	Depth	PCB	Cr	Pb	Hg	PAH
553.2	0 - 0.5	0.65	154	176	0.334	3.7
NE	0.5 - 1.5	0.42	181	183	0.502	2.7
	1.5 - 2.5	3.1	233	297	0.595	4.9
	2.5 - 3.5	1.2	207	246	0.486	6.9
	3.5 - 4	1.1	198	249	0.443	9.7

KKMB-SD-008

	Depth	Cr	Pb	Hg	PAH
552.0	0 - 0.5	383	503	1.11	8
4.6	0.5 - 1.5	298	451	0.913	5.5
	1.5 - 2.5	182	187	0.689	5.6
	2.5 - 3.5	216	82.4	0.794	18.4
	3.5 - 4.6	351	91.8	1.02	7.7
	4.6 - 5.3	14	11.1	0.215	0.043

KKR-20-052

	Depth	PCB	Cr	Pb	Hg	PAH
552.2	0 - 1	0.92	101	109	0.4	36.2
NE	1 - 3	2.4	180	221	0.51	46.8
	3 - 3.5	0.0021	103	71	0.75	63.4

LEGEND

- Analytical Sample Location
- Kinnickinnic River Project Area

Utilities
- Storm Sewer

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

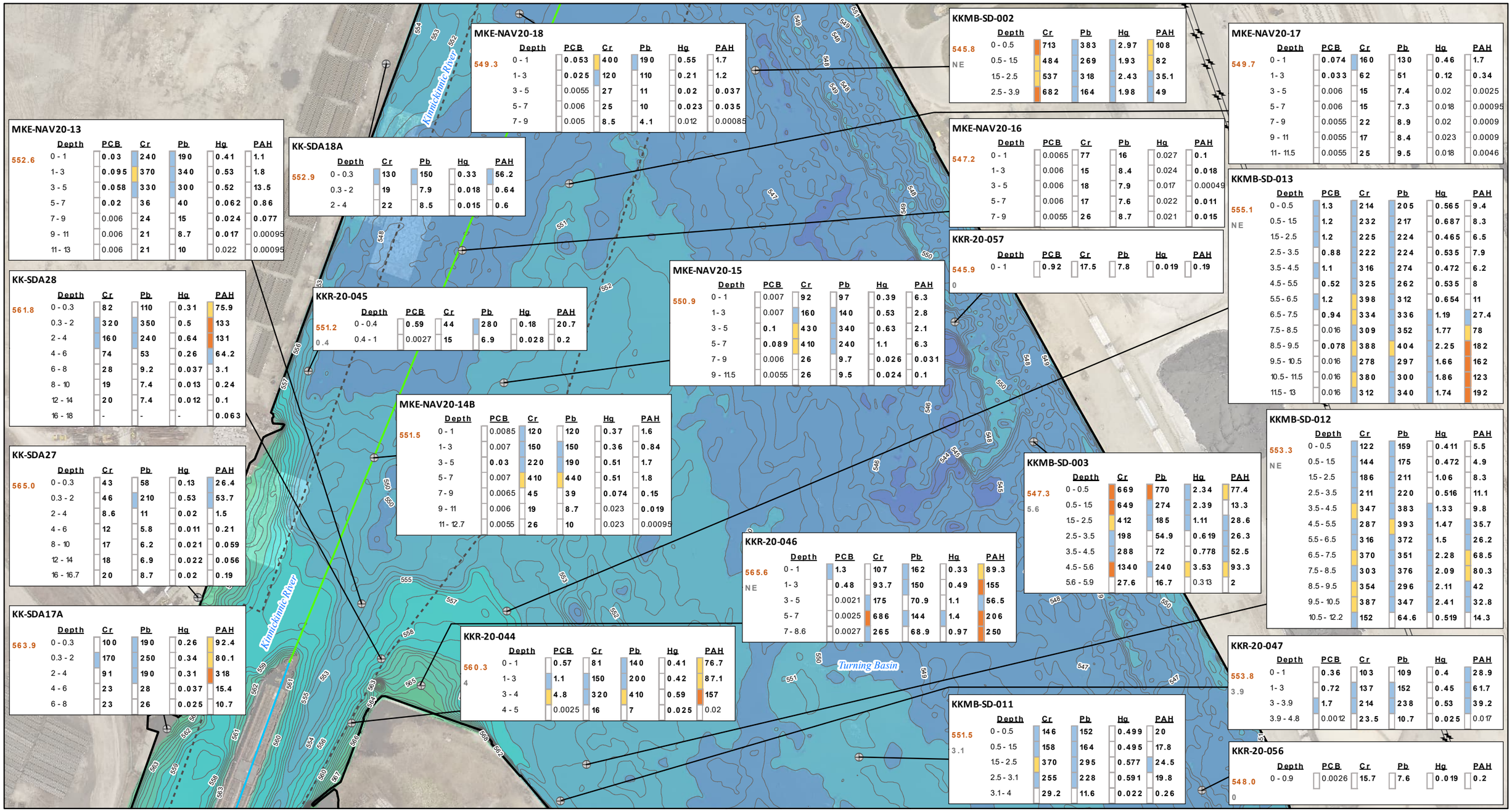
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; NE = not encountered; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-7A
Analytical Results Summary
Kinnickinnic River - Turning Basin
Map 1 of 2
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



MKE-NAV20-18

	Depth	PCB	Cr	Pb	Hg	PAH
549.3	0 - 1	0.053	400	190	0.55	1.7
	1 - 3	0.025	120	110	0.21	1.2
	3 - 5	0.0055	27	11	0.02	0.037
	5 - 7	0.006	25	10	0.023	0.035
	7 - 9	0.005	8.5	4.1	0.012	0.00085

KKMB-SD-002

	Depth	Cr	Pb	Hg	PAH
545.8	0 - 0.5	713	383	2.97	108
NE	0.5 - 1.5	484	269	1.93	82
	1.5 - 2.5	537	318	2.43	35.1
	2.5 - 3.9	682	164	1.98	49

MKE-NAV20-17

	Depth	PCB	Cr	Pb	Hg	PAH
549.7	0 - 1	0.074	160	130	0.46	1.7
	1 - 3	0.033	62	51	0.12	0.34
	3 - 5	0.006	15	7.4	0.02	0.0025
	5 - 7	0.006	15	7.3	0.018	0.00095
	7 - 9	0.0055	22	8.9	0.02	0.0009
	9 - 11	0.0055	17	8.4	0.023	0.0009
	11 - 11.5	0.0055	25	9.5	0.018	0.0046

MKE-NAV20-13

	Depth	PCB	Cr	Pb	Hg	PAH
552.6	0 - 1	0.03	240	190	0.41	1.1
	1 - 3	0.095	370	340	0.53	1.8
	3 - 5	0.058	330	300	0.52	13.5
	5 - 7	0.02	36	40	0.062	0.86
	7 - 9	0.006	24	15	0.024	0.077
	9 - 11	0.006	21	8.7	0.017	0.00095
	11 - 13	0.006	21	10	0.022	0.00095

KK-SDA18A

	Depth	Cr	Pb	Hg	PAH
552.9	0 - 0.3	130	150	0.33	56.2
	0.3 - 2	19	7.9	0.018	0.64
	2 - 4	22	8.5	0.015	0.6

MKE-NAV20-16

	Depth	PCB	Cr	Pb	Hg	PAH
547.2	0 - 1	0.0065	77	16	0.027	0.1
	1 - 3	0.006	15	8.4	0.024	0.018
	3 - 5	0.006	18	7.9	0.017	0.00049
	5 - 7	0.006	17	7.6	0.022	0.011
	7 - 9	0.0055	26	8.7	0.021	0.015

KKMB-SD-013

	Depth	PCB	Cr	Pb	Hg	PAH
555.1	0 - 0.5	1.3	214	205	0.565	9.4
NE	0.5 - 1.5	1.2	232	217	0.687	8.3
	1.5 - 2.5	1.2	225	224	0.465	6.5
	2.5 - 3.5	0.88	222	224	0.535	7.9
	3.5 - 4.5	1.1	316	274	0.472	6.2
	4.5 - 5.5	0.52	325	262	0.535	8
	5.5 - 6.5	1.2	398	312	0.654	11
	6.5 - 7.5	0.94	334	336	1.19	27.4
	7.5 - 8.5	0.016	309	352	1.77	78
	8.5 - 9.5	0.078	388	404	2.25	182
	9.5 - 10.5	0.016	278	297	1.66	162
	10.5 - 11.5	0.016	380	300	1.86	123
	11.5 - 13	0.016	312	340	1.74	192

KKR-20-057

	Depth	PCB	Cr	Pb	Hg	PAH
545.9	0 - 1	0.92	17.5	7.8	0.019	0.19
0						

KK-SDA28

	Depth	Cr	Pb	Hg	PAH
561.8	0 - 0.3	82	110	0.31	75.9
	0.3 - 2	320	350	0.5	133
	2 - 4	160	240	0.64	131
	4 - 6	74	53	0.26	64.2
	6 - 8	28	9.2	0.037	3.1
	8 - 10	19	7.4	0.013	0.24
	12 - 14	20	7.4	0.012	0.1
	16 - 18	-	-	-	0.063

KKR-20-045

	Depth	PCB	Cr	Pb	Hg	PAH
551.2	0 - 0.4	0.59	44	280	0.18	20.7
0.4	0.4 - 1	0.0027	15	6.9	0.028	0.2

MKE-NAV20-15

	Depth	PCB	Cr	Pb	Hg	PAH
550.9	0 - 1	0.007	92	97	0.39	6.3
	1 - 3	0.007	160	140	0.53	2.8
	3 - 5	0.1	430	340	0.63	2.1
	5 - 7	0.089	410	240	1.1	6.3
	7 - 9	0.006	26	9.7	0.026	0.031
	9 - 11.5	0.0055	26	9.5	0.024	0.1

MKE-NAV20-14B

	Depth	PCB	Cr	Pb	Hg	PAH
551.5	0 - 1	0.0085	120	120	0.37	1.6
	1 - 3	0.007	150	150	0.36	0.84
	3 - 5	0.03	220	190	0.51	1.7
	5 - 7	0.007	410	440	0.51	1.8
	7 - 9	0.0065	45	39	0.074	0.15
	9 - 11	0.006	19	8.7	0.023	0.019
	11 - 12.7	0.0055	26	10	0.023	0.00095

KK-SDA27

	Depth	Cr	Pb	Hg	PAH
565.0	0 - 0.3	43	58	0.13	26.4
	0.3 - 2	46	210	0.53	53.7
	2 - 4	8.6	11	0.02	1.5
	4 - 6	12	5.8	0.011	0.21
	8 - 10	17	6.2	0.021	0.059
	12 - 14	18	6.9	0.022	0.056
	16 - 16.7	20	8.7	0.02	0.19

KKMB-SD-003

	Depth	Cr	Pb	Hg	PAH
547.3	0 - 0.5	669	770	2.34	77.4
5.6	0.5 - 1.5	649	274	2.39	13.3
	1.5 - 2.5	412	185	1.11	28.6
	2.5 - 3.5	198	54.9	0.619	26.3
	3.5 - 4.5	288	72	0.778	52.5
	4.5 - 5.6	1340	240	3.53	93.3
	5.6 - 5.9	27.6	16.7	0.313	2

KKMB-SD-012

	Depth	Cr	Pb	Hg	PAH
553.3	0 - 0.5	122	159	0.411	5.5
NE	0.5 - 1.5	144	175	0.472	4.9
	1.5 - 2.5	186	211	1.06	8.3
	2.5 - 3.5	211	220	0.516	11.1
	3.5 - 4.5	347	383	1.33	9.8
	4.5 - 5.5	287	393	1.47	35.7
	5.5 - 6.5	316	372	1.5	26.2
	6.5 - 7.5	370	351	2.28	68.5
	7.5 - 8.5	303	376	2.09	80.3
	8.5 - 9.5	354	296	2.11	42
	9.5 - 10.5	387	347	2.41	32.8
	10.5 - 12.2	152	64.6	0.519	14.3

KK-SDA17A

	Depth	Cr	Pb	Hg	PAH
563.9	0 - 0.3	100	190	0.26	92.4
	0.3 - 2	170	250	0.34	80.1
	2 - 4	91	190	0.31	318
	4 - 6	23	28	0.037	15.4
	6 - 8	23	26	0.025	10.7

KKR-20-046

	Depth	PCB	Cr	Pb	Hg	PAH
565.6	0 - 1	1.3	107	162	0.33	89.3
NE	1 - 3	0.48	93.7	150	0.49	155
	3 - 5	0.0021	175	70.9	1.1	56.5
	5 - 7	0.0025	686	144	1.4	206
	7 - 8.6	0.0027	265	68.9	0.97	250

KKR-20-044

	Depth	PCB	Cr	Pb	Hg	PAH
560.3	0 - 1	0.57	81	140	0.41	76.7
4	1 - 3	1.1	150	200	0.42	87.1
	3 - 4	4.8	320	410	0.59	157
	4 - 5	0.0025	16	7	0.025	0.02

KKMB-SD-011

	Depth	Cr	Pb	Hg	PAH
551.5	0 - 0.5	146	152	0.499	20
3.1	0.5 - 1.5	158	164	0.495	17.8
	1.5 - 2.5	370	295	0.577	24.5
	2.5 - 3.1	255	228	0.591	19.8
	3.1 - 4	29.2	11.6	0.022	0.26

KKR-20-047

	Depth	PCB	Cr	Pb	Hg	PAH
553.8	0 - 1	0.36	103	109	0.4	28.9
3.9	1 - 3	0.72	137	152	0.45	61.7
	3 - 3.9	1.7	214	238	0.53	39.2
	3.9 - 4.8	0.0012	23.5	10.7	0.025	0.017

KKR-20-056

	Depth	PCB	Cr	Pb	Hg	PAH
548.0	0 - 0.9	0.0026	15.7	7.6	0.019	0.2
0						

LEGEND

- Analytical Sample Location
- Federal Navigation Channel
- Kinnickinnic River Project Area

Utilities
- Electric

Kinnickinnic River Reach Areas
- Reach 3
- Reach 4

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss) 1 - 3		>PEC	>PEC
3 - 5		>3xPEC	>3xPEC
5 - 50		>5xPEC	>5xPEC
>50			

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

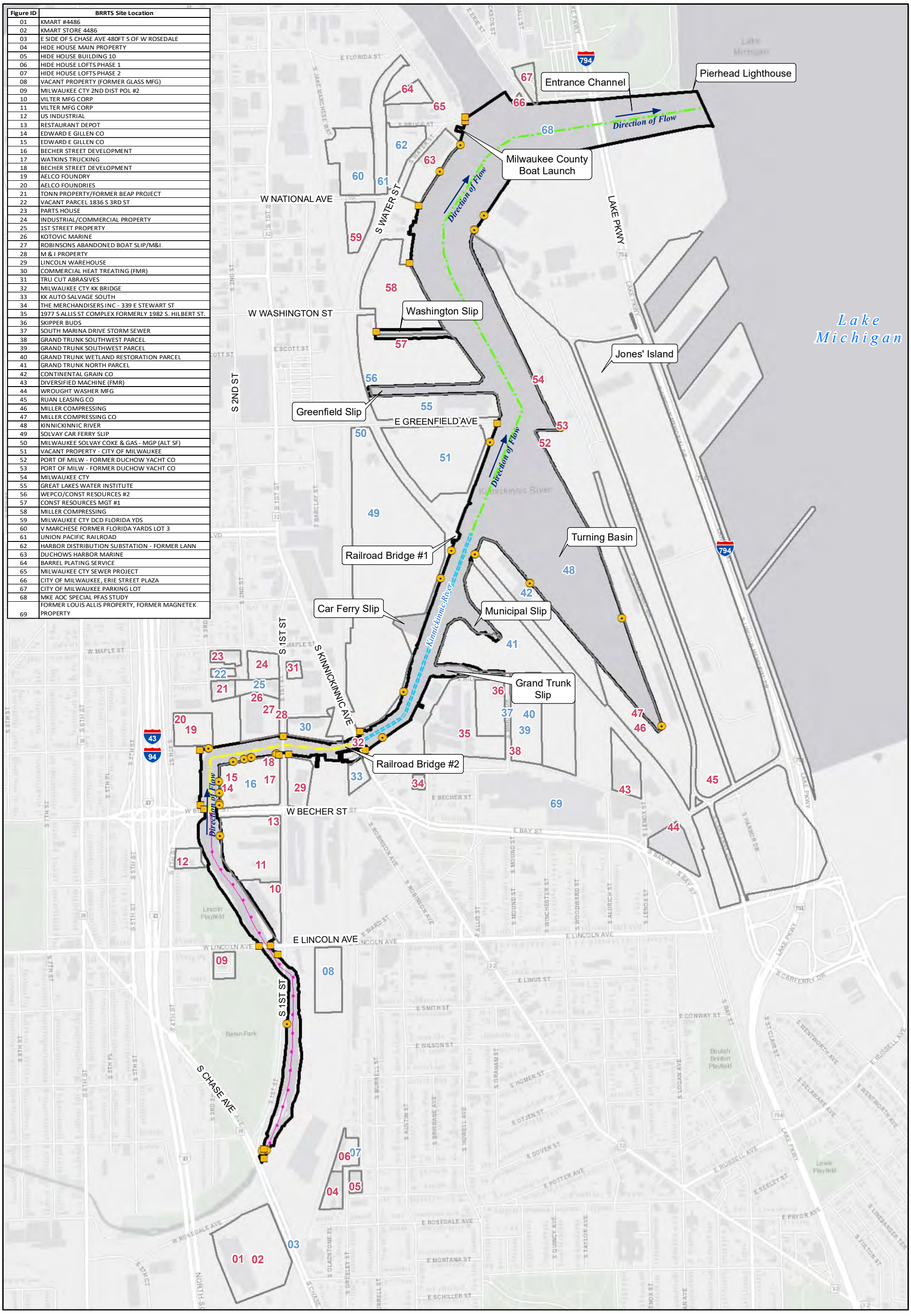
NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 2-7B
Analytical Results Summary
Kinnickinnic River - Turning Basin
Map 2 of 2
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Figure ID	BRRTS Site Location
01	KMART #4486
02	KMART STORE 4486
03	E SIDE OF S CHASE AVE 480FT S OF W ROSEDALE
04	HIDE HOUSE MAIN PROPERTY
05	HIDE HOUSE BUILDING 10
06	HIDE HOUSE LOFTS PHASE 1
07	HIDE HOUSE LOFTS PHASE 2
08	VACANT PROPERTY (FORMER GLASS MFG)
09	MILWAUKEE CTY 2ND DIST POL #2
10	VILTER MFG CORP
11	VILTER MFG CORP
12	US INDUSTRIAL
13	RESTAURANT DEPOT
14	EDWARD E GILLEN CO
15	EDWARD E GILLEN CO
16	BECHER STREET DEVELOPMENT
17	WATKINS TRUCKING
18	BECHER STREET DEVELOPMENT
19	AELCO FOUNDRY
20	AELCO FOUNDRIES
21	TONN PROPERTY/FORMER BEAP PROJECT
22	VACANT PARCEL 1836 S 3RD ST
23	PARTS HOUSE
24	INDUSTRIAL/COMMERCIAL PROPERTY
25	1ST STREET PROPERTY
26	KOTOVIC MARINE
27	ROBINSONS ABANDONED BOAT SLIP/M&I
28	M & I PROPERTY
29	LINCOLN WAREHOUSE
30	COMMERCIAL HEAT TREATING (FMR)
31	TRU CUT ABRASIVES
32	MILWAUKEE CTY KK BRIDGE
33	KK AUTO SALVAGE SOUTH
34	THE MERCHANDISERS INC - 339 E STEWART ST
35	1977 S ALLIS ST COMPLEX FORMERLY 1982 S. HILBERT ST.
36	SKIPPER BUDS
37	SOUTH MARINA DRIVE STORM SEWER
38	GRAND TRUNK SOUTHWEST PARCEL
39	GRAND TRUNK SOUTHWEST PARCEL
40	GRAND TRUNK WETLAND RESTORATION PARCEL
41	GRAND TRUNK NORTH PARCEL
42	CONTINENTAL GRAIN CO
43	DIVERSIFIED MACHINE (FMR)
44	WROUGHT WASHER MFG
45	RUAN LEASING CO
46	MILLER COMPRESSING
47	MILLER COMPRESSING CO
48	KINNICKINNIC RIVER
49	SOLVAY CAR FERRY SLIP
50	MILWAUKEE SOLVAY COKE & GAS - MGP (ALT SF)
51	VACANT PROPERTY - CITY OF MILWAUKEE
52	PORT OF MILW - FORMER DUCHOW YACHT CO
53	PORT OF MILW - FORMER DUCHOW YACHT CO
54	MILWAUKEE CTY
55	GREAT LAKES WATER INSTITUTE
56	WEPCO/CONST RESOURCES #2
57	CONST RESOURCES MGT #1
58	MILLER COMPRESSING
59	MILWAUKEE CTY DCD FLORIDA YDS
60	V MARCHESE FORMER FLORIDA YARDS LOT 3
61	UNION PACIFIC RAILROAD
62	HARBOR DISTRIBUTION SUBSTATION - FORMER LANN
63	DUCHOWS HARBOR MARINE
64	BARREL PLATING SERVICE
65	MILWAUKEE CTY SEWER PROJECT
66	CITY OF MILWAUKEE, ERIE STREET PLAZA
67	CITY OF MILWAUKEE PARKING LOT
68	MKE AOC SPECIAL PFAS STUDY
69	FORMER LOUIS ALLIS PROPERTY, FORMER MAGNETEK PROPERTY



LEGEND

- Combined Sewer Outfall Noted and Mapped During Jacobs Fall 2021 Shoreline Assessment
- Storm Sewer Outfall Noted and Mapped During Jacobs Fall 2021 Shoreline Assessment
- Kinnickinnic River Project Area

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3
- Reach 4

- BRRTS Site Boundary
- 01 Closed BRRTS Site Identification Number
- 03 Open BRRTS Site Identification Number

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Parcel data provided by The Milwaukee County Land Information Office dated December 21, 2020.
3. BRRTS = WDNR Bureau for Remediation and Redevelopment Tracking System; WDNR = Wisconsin Department of Natural Resources

N

0 450 900

Approximate scale in feet

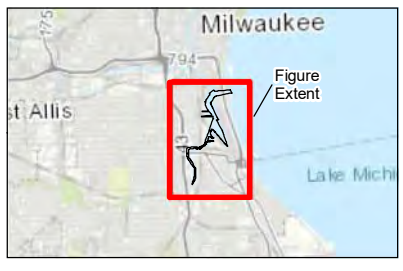
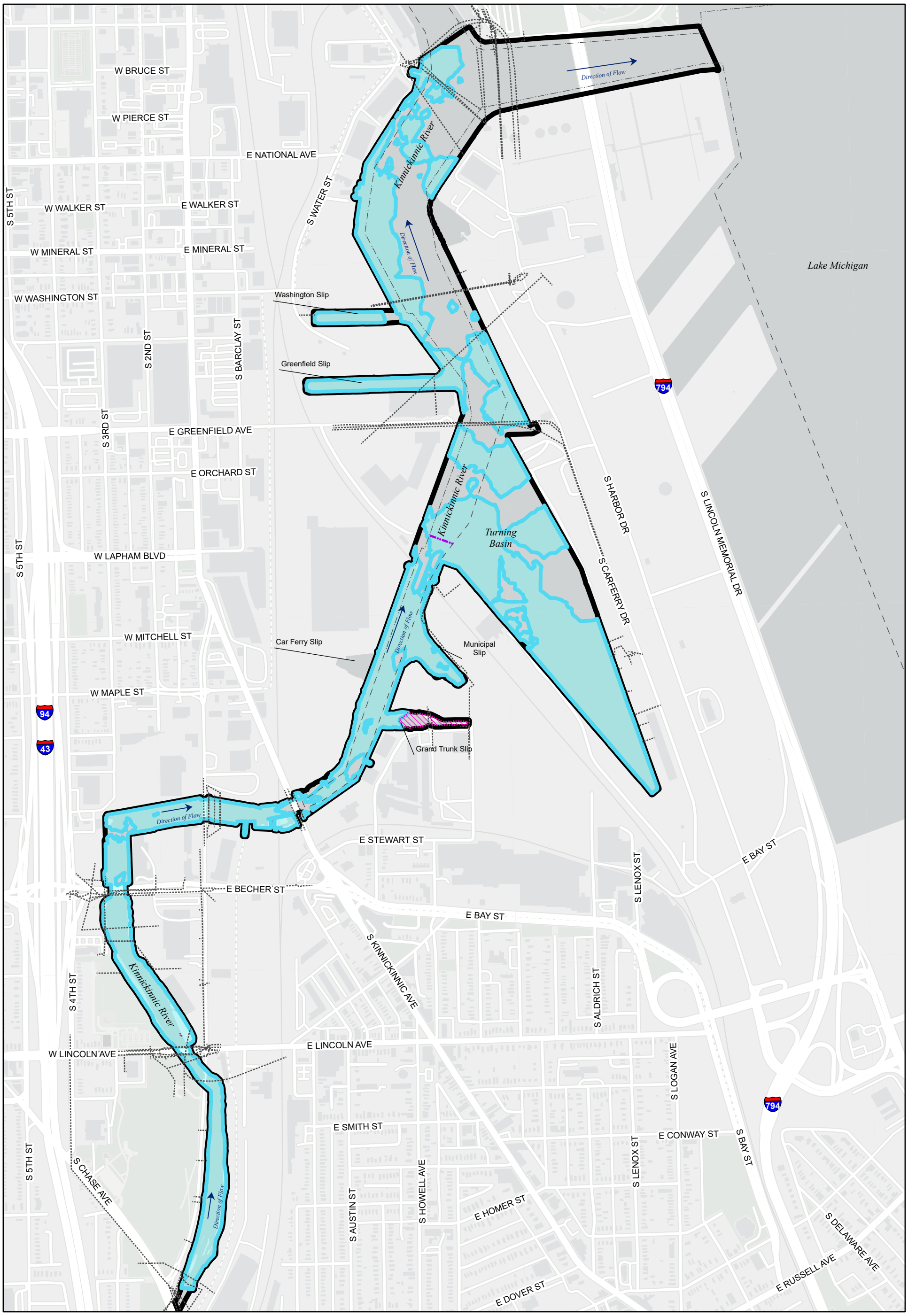


Figure 2-8
Potential Sources -
Kinnickinnic River Project Area
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Remediation Target Area - Alternative 2
- TSCA Dredge Limits
- Kinnickinnic River Project Area
- Utilities
- Federal Navigation Channel
- Federal Navigation Channel elevation change from 551 feet NAVD88 (downstream of line) to 557 NAVD88 (upstream of line)

N

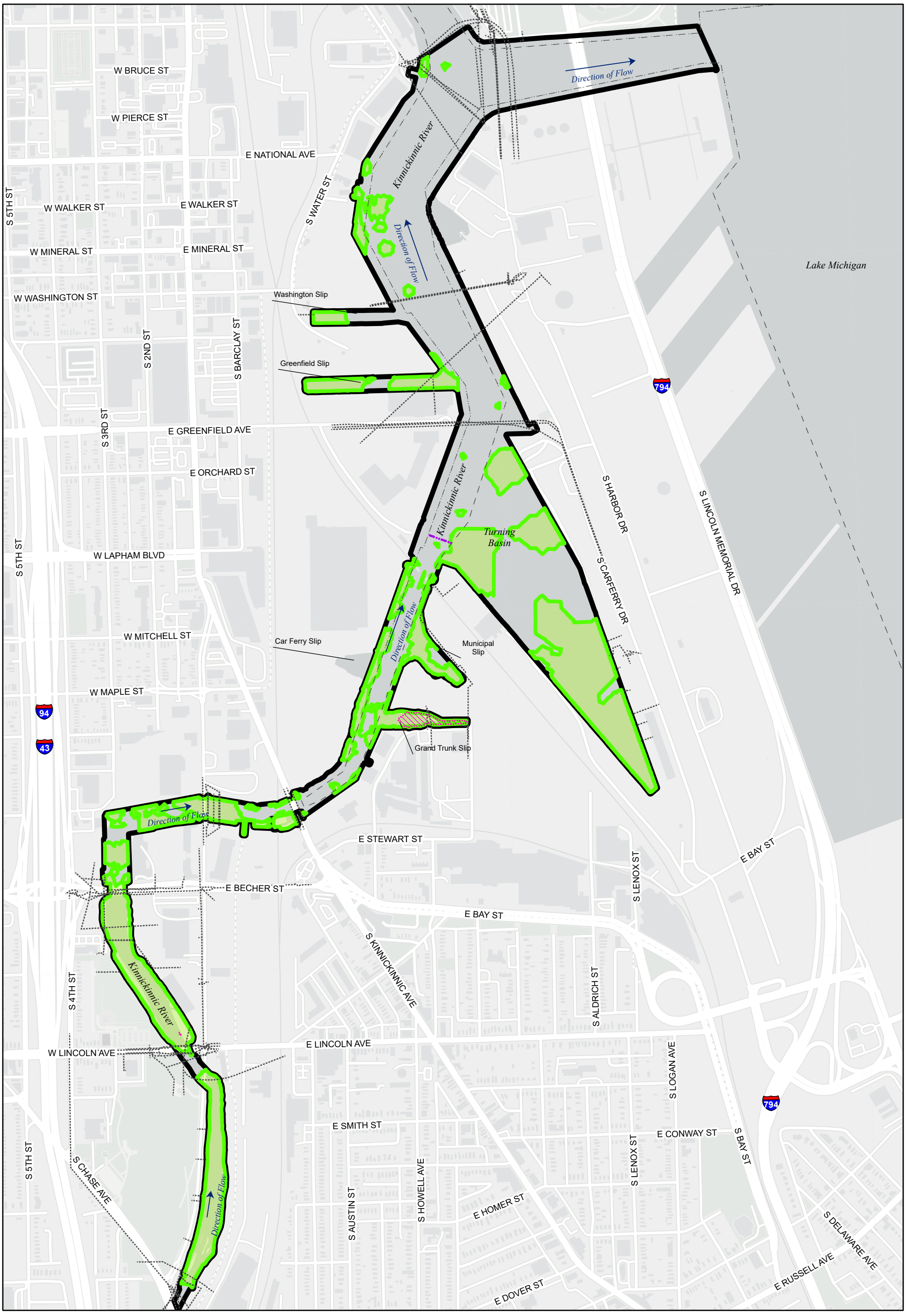
0 375 750

Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Cr = chromium; Hg = mercury; mg/kg = milligram(s) per kilogram; NAVD88 = North American Vertical Datum of 1988; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PECs = Probable Effects Concentrations from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application, Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003); TSCA = Toxic Substances Control Act (50 mg/kg)

Figure 3-1
Remediation Target Areas - Kinnickinnic River Alternative 2 - Total PCBs > 1 mg/kg, or metals (Cr, Hg, or Pb) or Total PAHs > PECs
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Remediation Target Area - Alternative 3
- TSCA Dredge Limits
- Kinnickinnic River Project Area
- Utilities
- Federal Navigation Channel
- Federal Navigation Channel elevation change from 551 feet NAVD88 (downstream of line) to 557 NAVD88 (upstream of line)

N

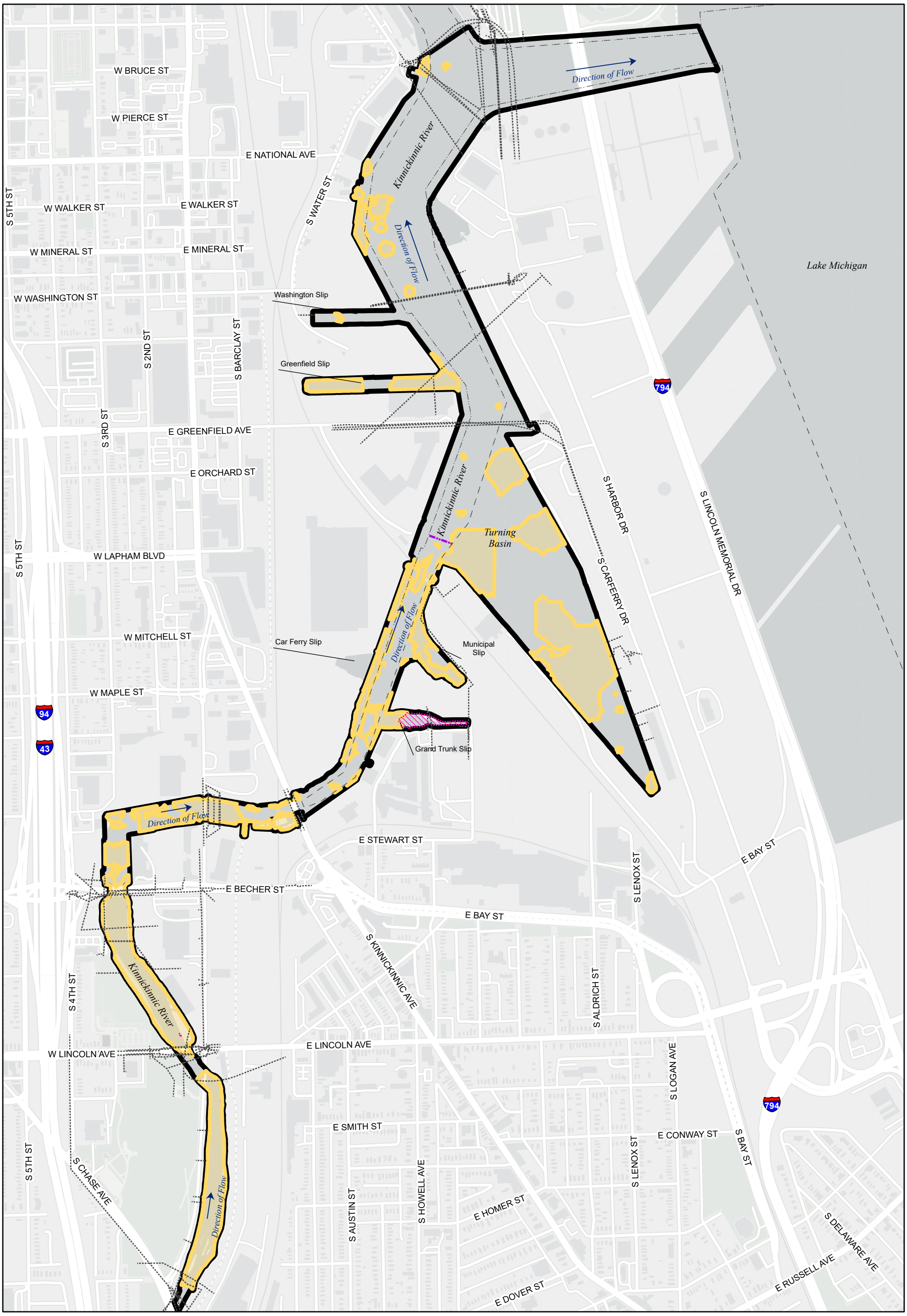
0 375 750

Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. 3x = 3 times; Cr = chromium; Hg = mercury; mg/kg = milligram(s) per kilogram; NAVD88 = North American Vertical Datum of 1988; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PECs = Probable Effects Concentrations from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application, Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003); TSCA = Toxic Substances Control Act (50 mg/kg)

Figure 3-2
Remediation Target Areas - Kinnickinnic River Alternatives 3 and 3A - Total PCBs > 1 mg/kg, or metals (Cr, Hg, or Pb) or Total PAHs > 3x PECs
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



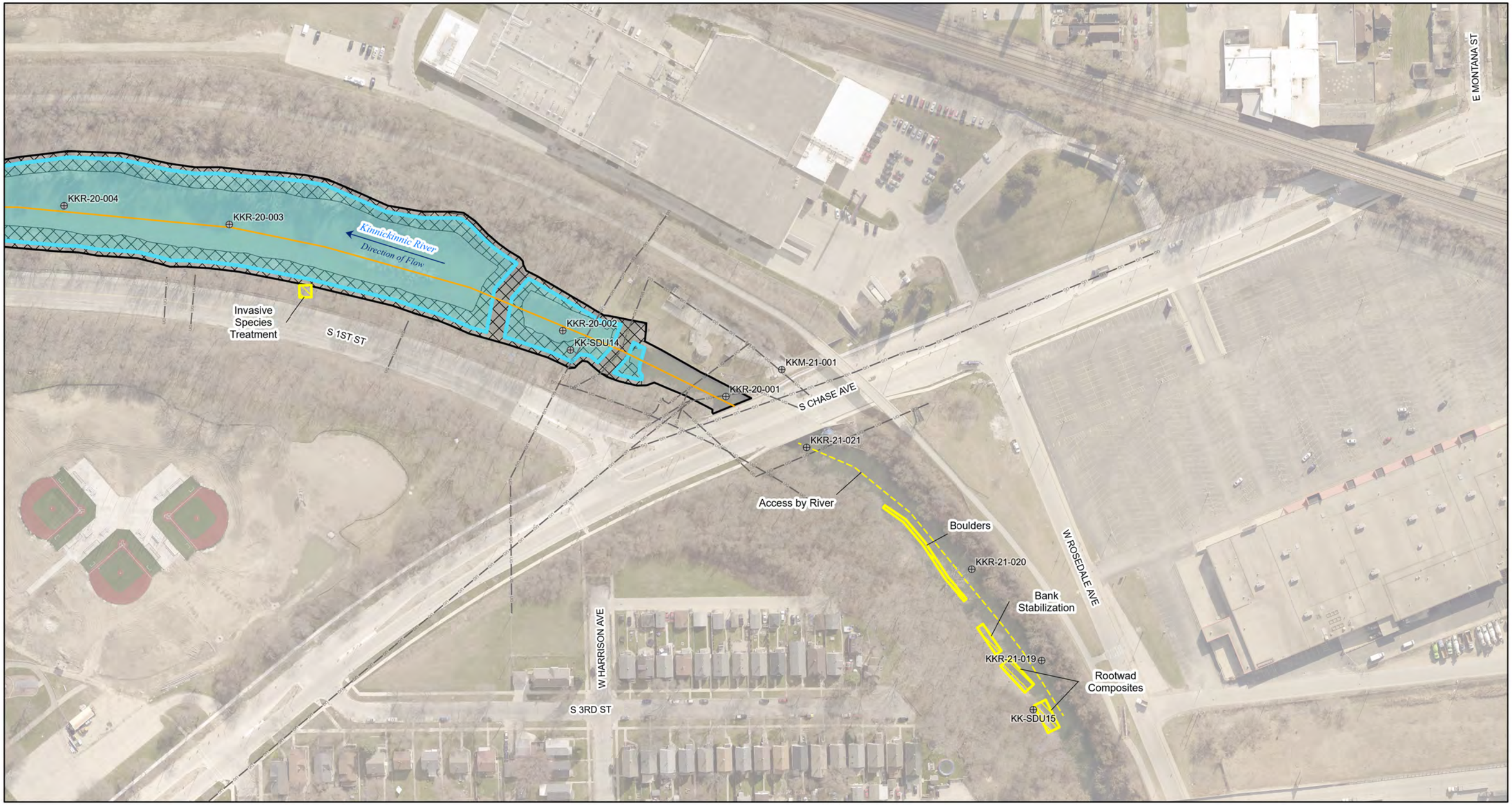
LEGEND

- Remediation Target Area - Alternative 4
- TSCA Dredge Limits
- Kinnickinnic River Project Area
- Utilities
- Federal Navigation Channel
- Federal Navigation Channel elevation change from 551 feet NAVD88 (downstream of line) to 557 NAVD88 (upstream of line)

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. Cr = chromium; Hg = mercury; mg/kg = milligram(s) per kilogram; NAVD88 = North American Vertical Datum of 1988; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PECs = Probable Effects Concentrations from Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application, Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003); TSCA = Toxic Substances Control Act (50 mg/kg)

Figure 3-3
Remediation Target Areas - Kinnickinnic River Alternative 4 - Total PCBs > 3 mg/kg, or metals (Cr, Hg, or Pb) or Total PAHs > 3x PECs
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 1

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)
3. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

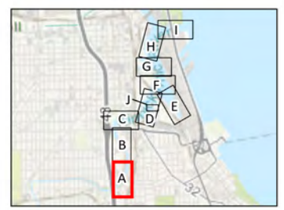
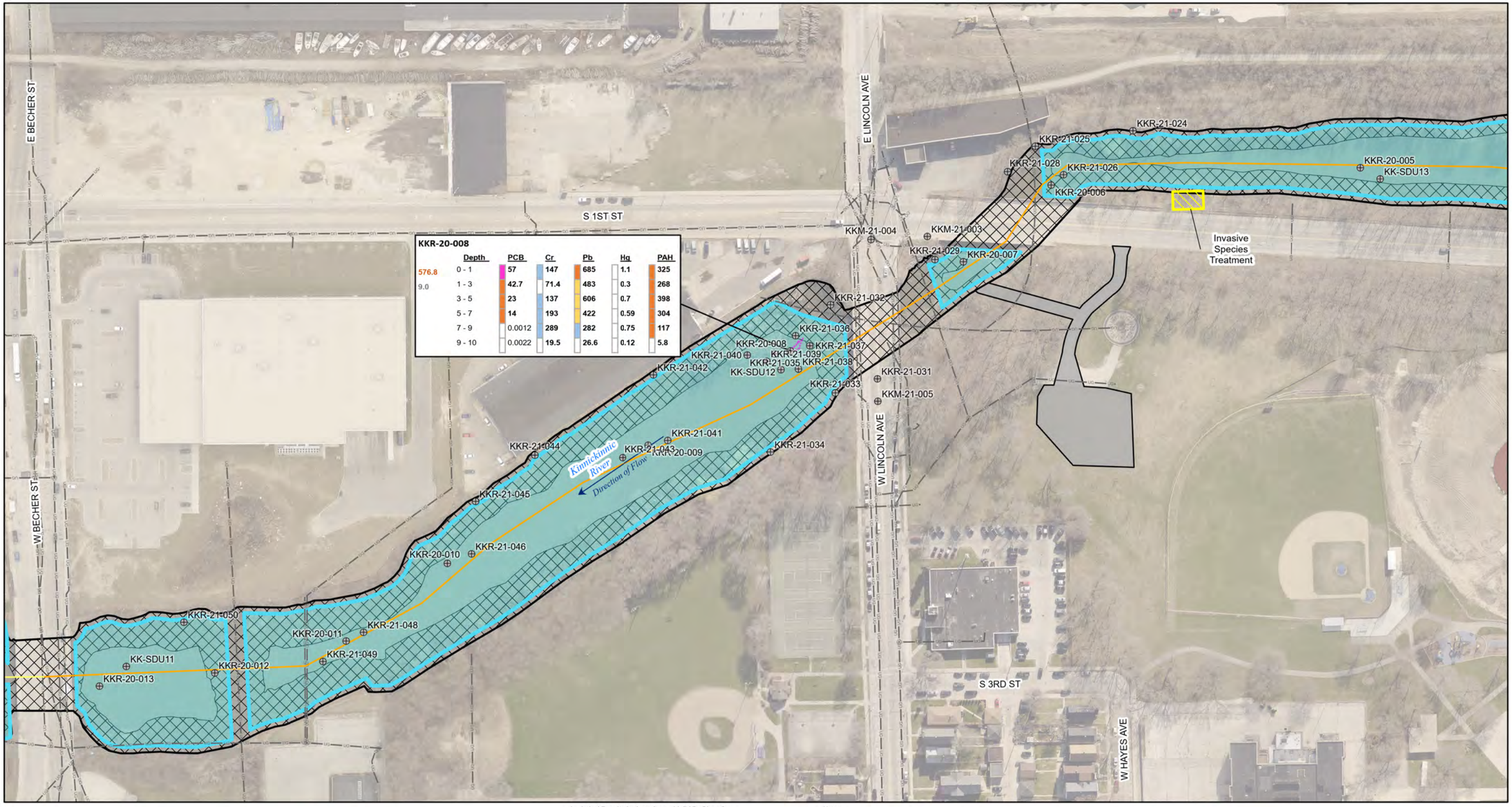


Figure 5-1A
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2

N

0 75 150

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID				
Mudline Elevation	Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth		<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)
4. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

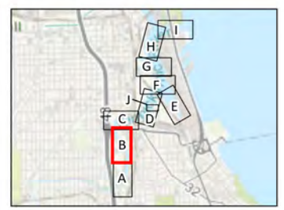
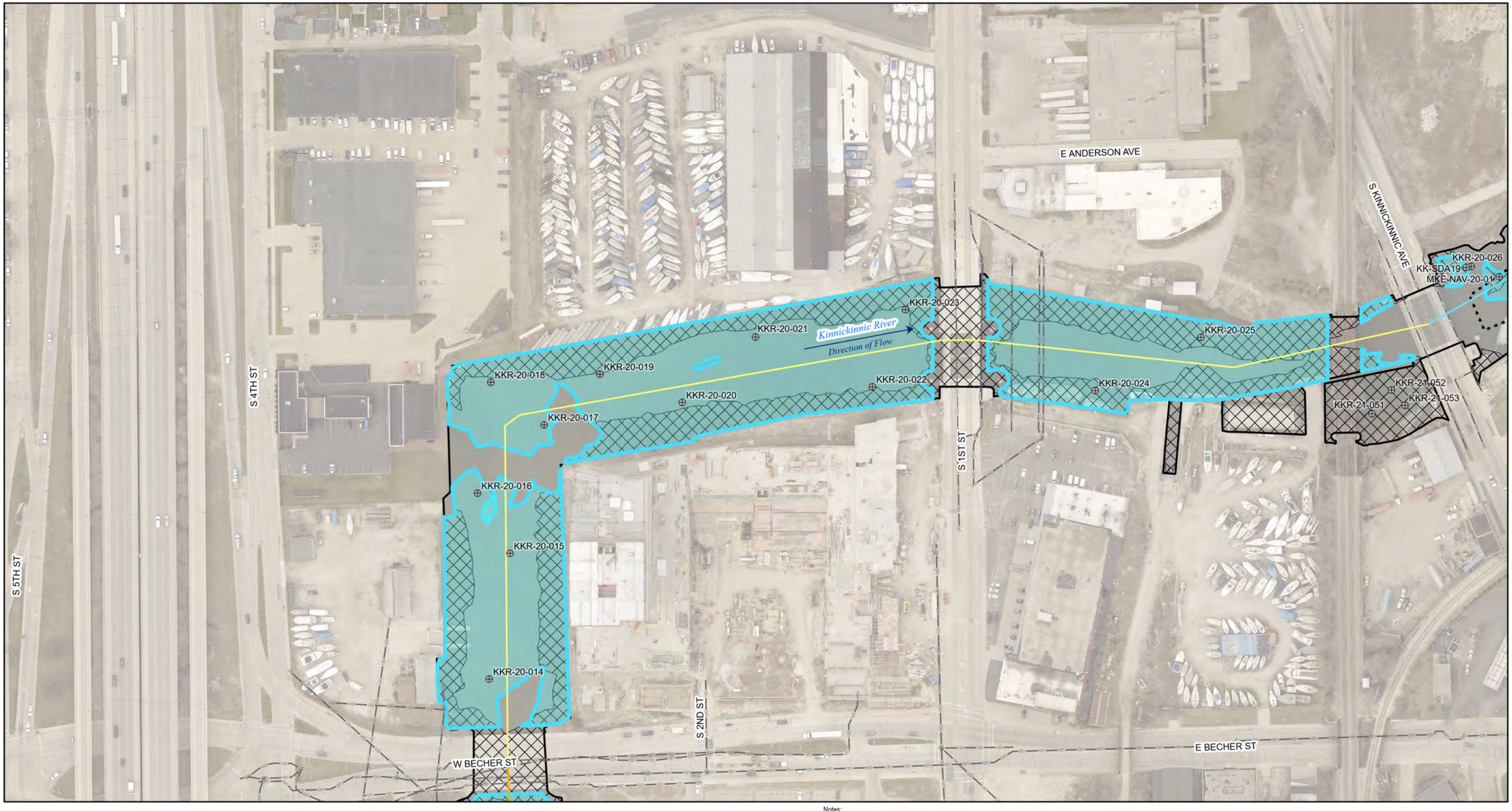


Figure 5-1B
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

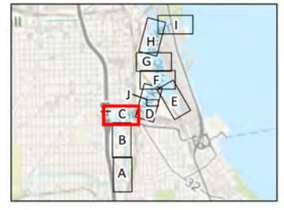


Figure 5-1C
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

See Figure 5-1J

Municipal Slip

Grand Trunk Slip

Car Ferry Slip - We Energies Remedial Action

Kinnickinnic River

Direction of Flow

S ALLIS ST

E STEWART ST

S HILBERT ST

S KINNICKINNIC AVE

KKR-20-031 KKR-21-054 KKR-21-55A KKR-21-055 KKR-22-006 MK-KKR-22-006 KKR-21-056 KKR-20-032 KKR-21-057 KKR-22-003 MK-KKR-22-003 KKR-22-005 MK-KKR-22-005 KKR-22-008 MK-KKR-22-008 KK-SDA23 KKR-22-002 MK-KKR-22-002 MK-KKR-22-004 KKR-22-004 MK-KKR-22-007 KKR-22-007 KKR-22-001 MK-KKR-22-001 KKR-20-033 KKR-20-030 KKR-20-029 KKR-20-028 KKR-20-027 KKR-20-026 KKR-21-053 KKR-21-052

KKR-20-038 KKR-20-039 KKR-20-040 KKR-20-041 KKR-20-043 KKR-20-042 KKR-20-036 KKR-20-035 KKR-20-037 KKR-20-034

KK-SDA16A KK-SDA25 KK-SDA14 KK-SDA22 KK-SDA21 KK-SDA26 KK-SDA15 KK-SDA13A KK-SDA13 KK-SDA20 KK-SDA12 KK-SDA11 KK-SDA24 KK-SDA19

MKE-NAV-20-12A MKE-NAV-20-12B MKE-NAV-20-10 MKE-NAV-20-08 MKE-NAV-20-06 MKE-NAV-20-11 MKE-NAV-20-09 MKE-NAV-20-07 MKE-NAV-20-04 MKE-NAV-20-05 MKE-NAV-20-03 MKE-NAV-20-02 MKE-NAV-20-01

KR01 KR02 KR03 KR04

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Shoreline Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 2
- Reach 3

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

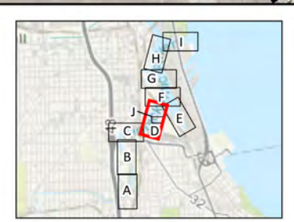
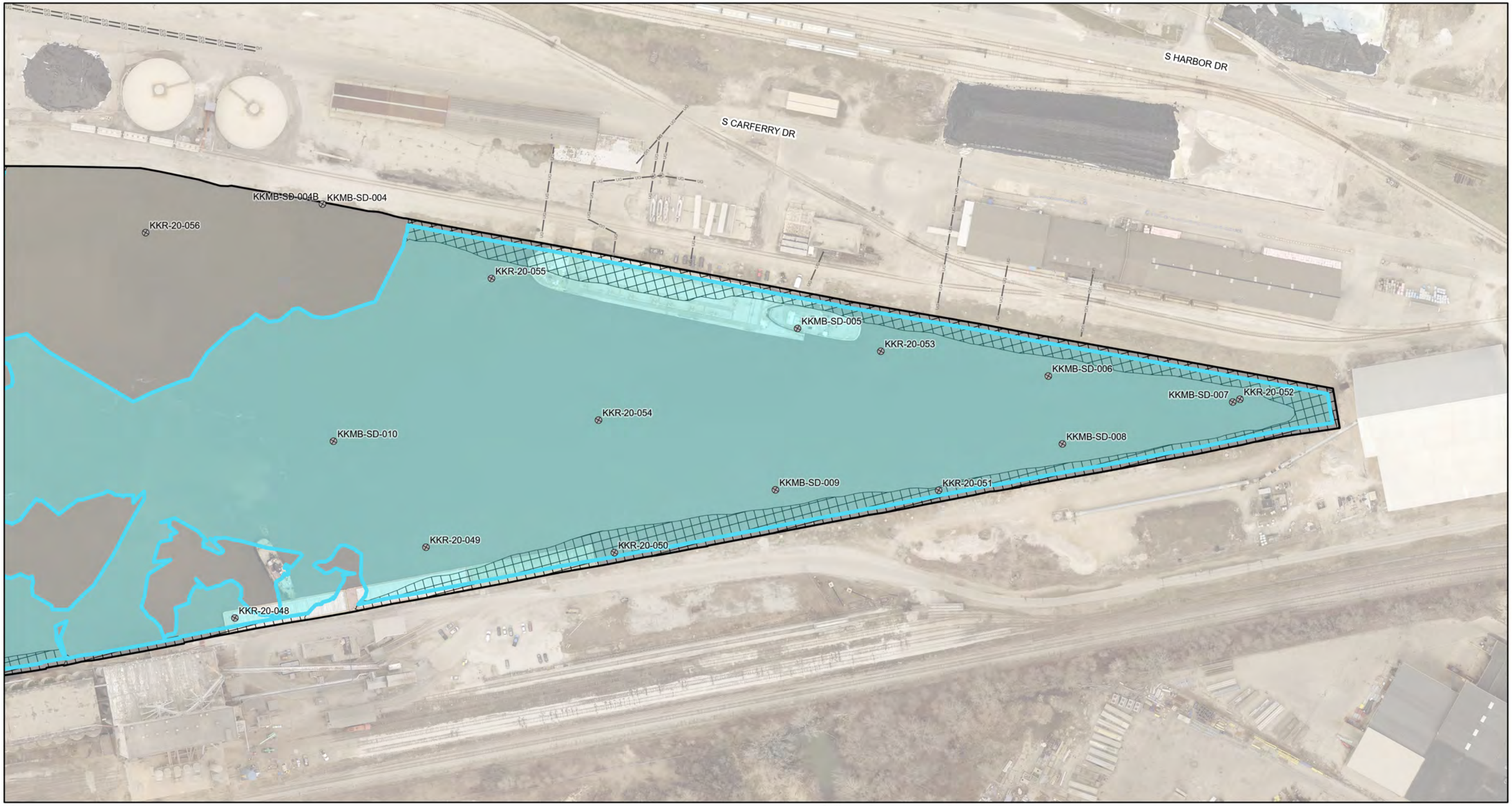


Figure 5-1D
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

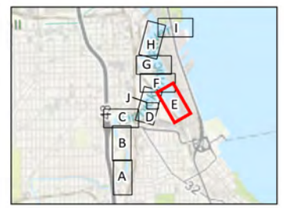


Figure 5-1E
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

MKE-NAV-20-19
MKE-NAV-20-18
KK-SDA18A
KKMB-SD-002
MKE-NAV-20-17
MKE-NAV-20-16
KKR-20-057
KKR-20-045
MKE-NAV-20-15
KKMB-SD-003
MKE-NAV-20-14B
Kinnickinnic River
Direction of Flow
KK-SDA27
MKE-NAV-20-13
KKMB-SD-013
KK-SDA28
KKR-20-046
KKR-20-044
KK-SDA17A
Railroad Bridge
KKMB-SD-012
KKMB-SD-011
KKR-20-047
KKR-20-056
KR01
KKR-20-043
MKE-NAV-20-12A
KKMB-SD-004B
KKMB-SD-004
S HARBOR DR
S CARFERRY DR

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 3
- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

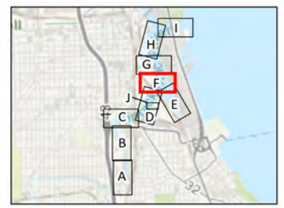
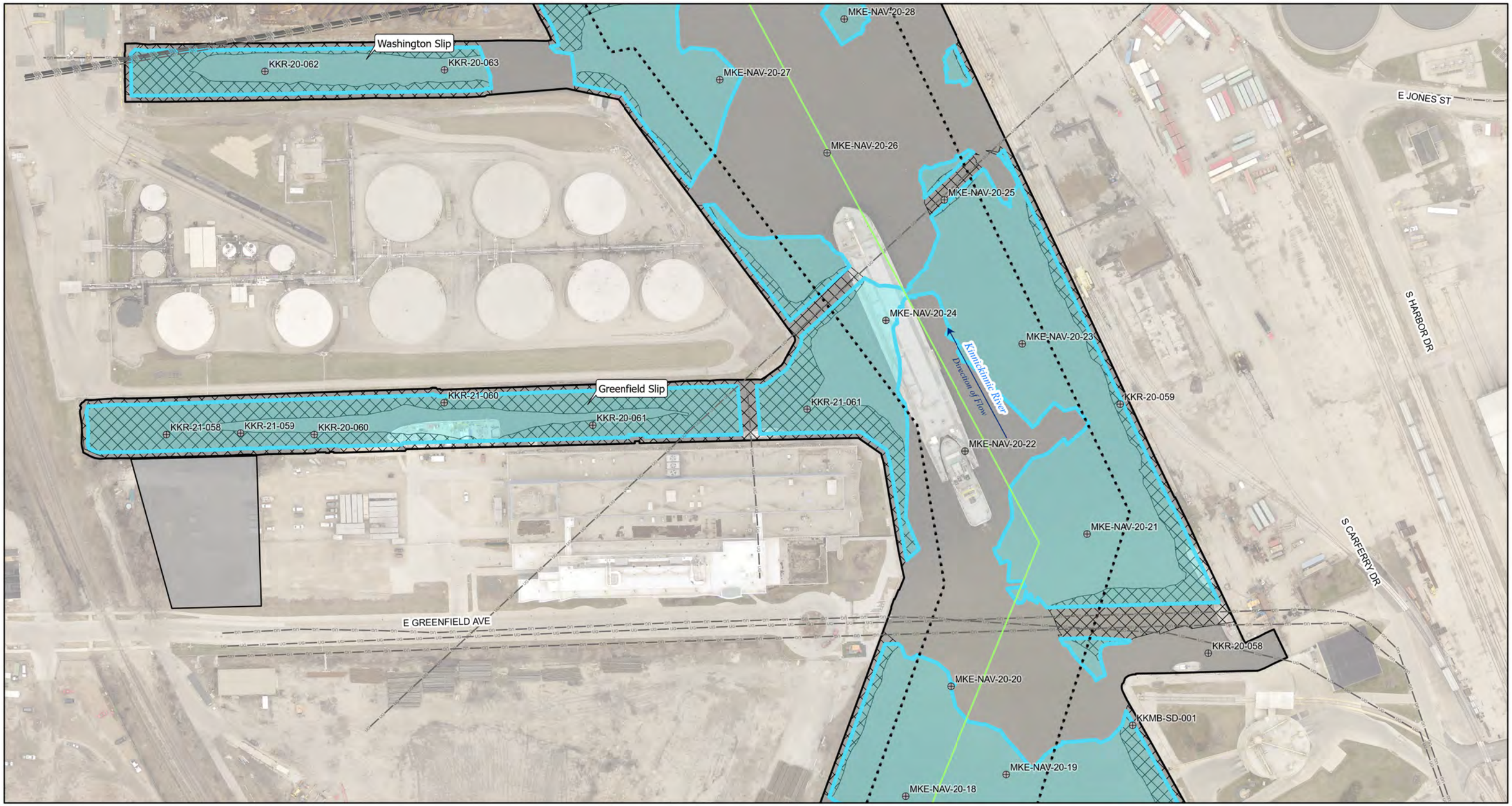


Figure 5-1F
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

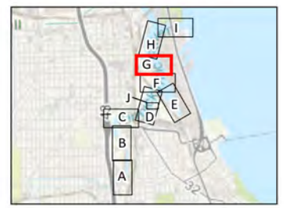
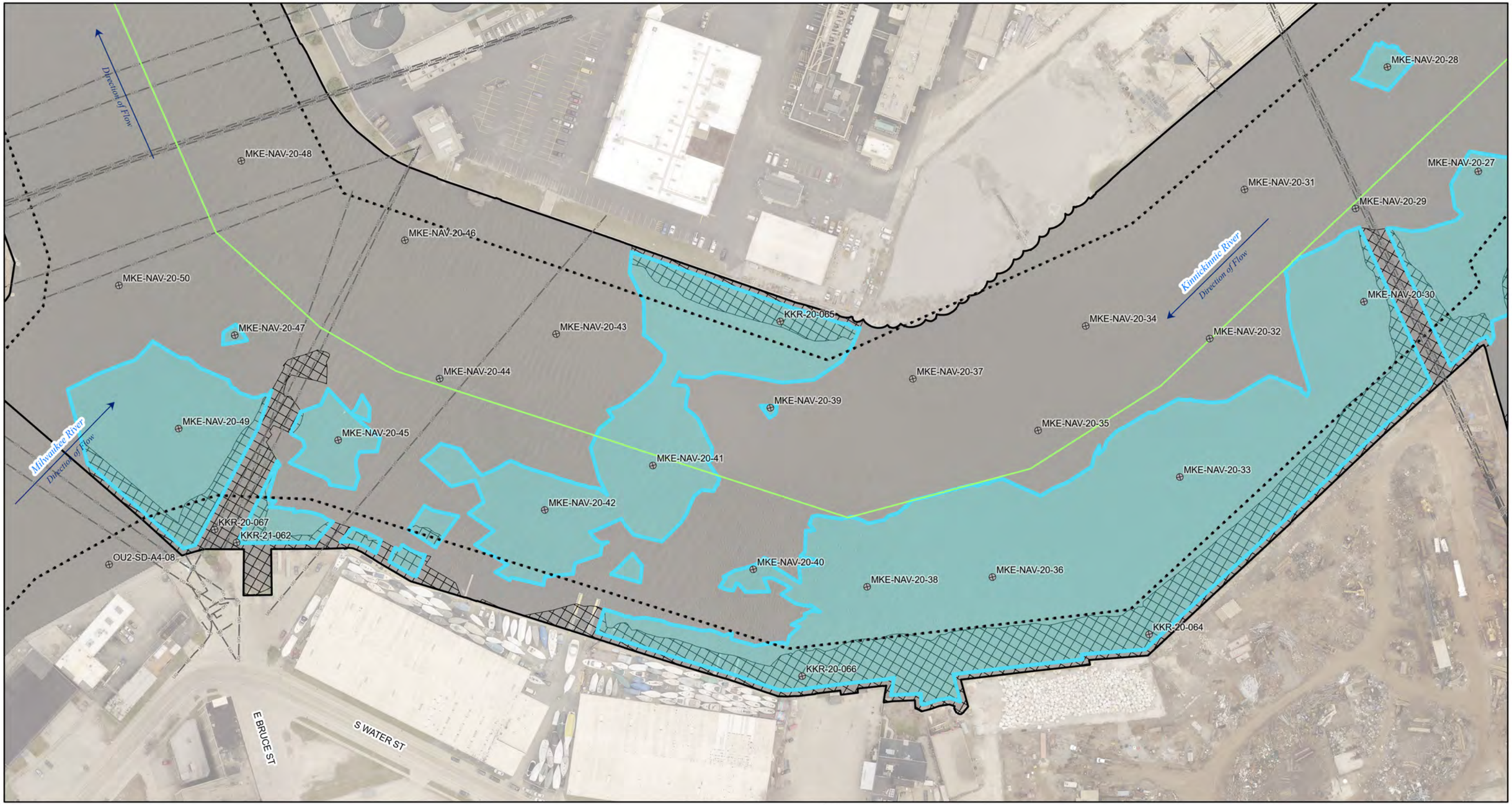


Figure 5-1G
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

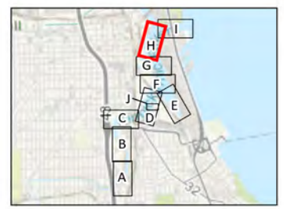
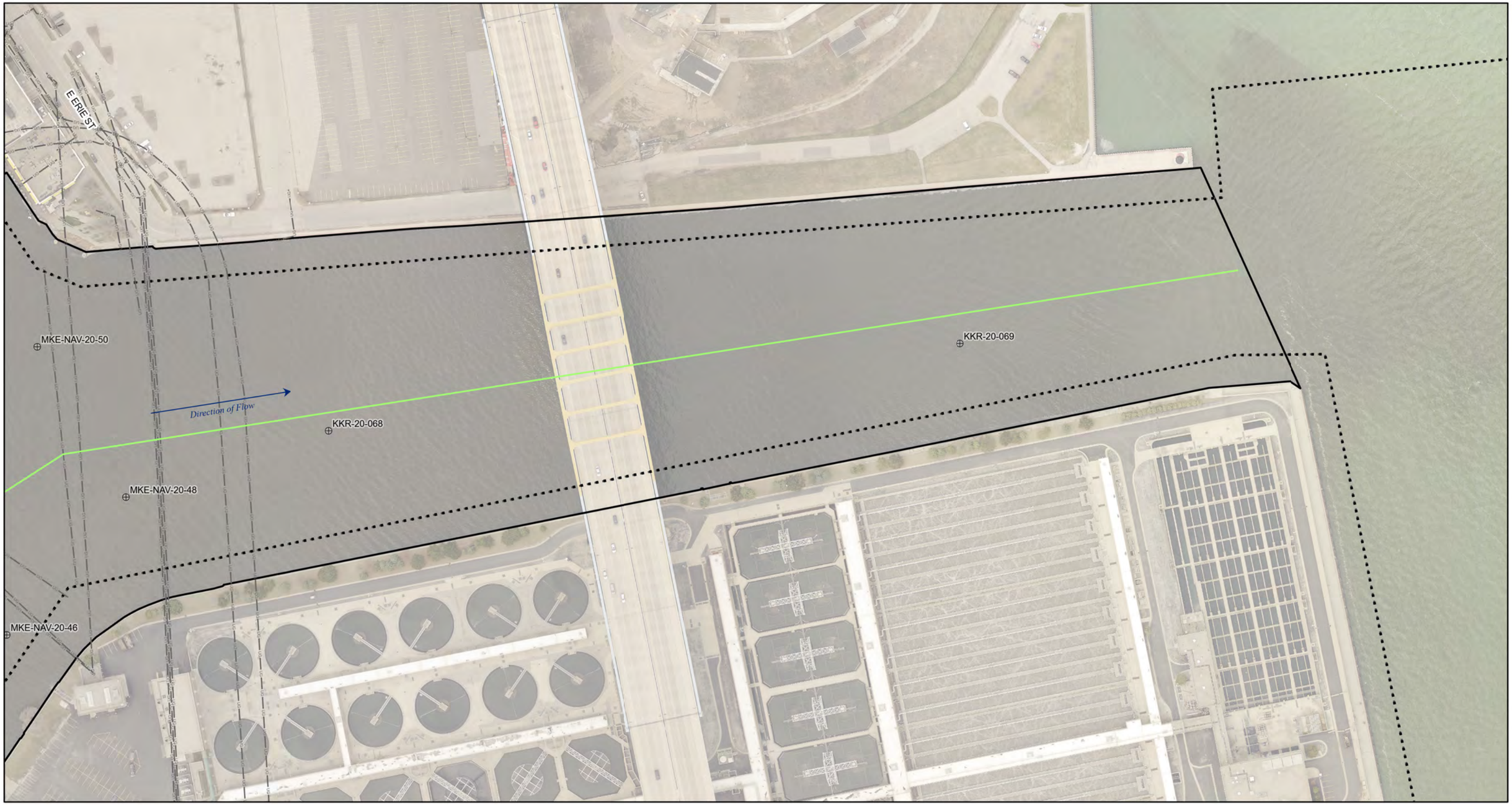


Figure 5-1H
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area

Kinnickinnic River Reach Areas

- Reach 4

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

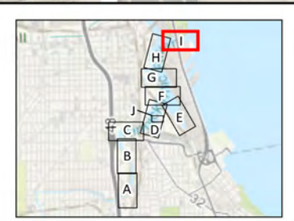


Figure 5-1I
Kinnickinnic River Site Features - Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-22-002

576.1 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	8.7	130	320	0.26	74.6
1 - 2	28.9	340	610	0.42	223
2 - 3	17.9	770	420	0.76	211
3 - 3.8	0.65	540	240	1.2	148
5 - 6	0.85	32	170	0.39	32

KK-SDA23

574.4

Depth	Cr	Pb	Hg	PAH
0 - 0.3	130	270	0.27	92
0.3 - 2	220	530	0.34	128
4 - 6	21000	1500	1.5	174
6 - 8	40000	1200	2.5	101
8 - 10	28000	590	2.7	132
12 - 14	30000	440	2.1	107
14 - 16	11000	240	1.1	66.4
16 - 18	27	9.1	0.014	0.49
20 - 21	37	10	0.015	0.096

KKR-22-003

576.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	42	250	660	0.4	161
1 - 2	59	1200	3600	1.1	223
2 - 3.1	1.05	11000	470	1.1	302
5 - 6	1.05	10000	270	1.4	113
6 - 7	1.1	3100	210	0.7	154
7 - 8	1	370	160	0.54	154
10 - 11	1.05	27	57	0.25	16.4
11 - 12	0.95	6.4	3.2	0.012	0.31
12 - 13	0.85	11	5	0.014	1.81
13 - 14	0.85	11	5.1	0.015	0.26

KKR-21-057

577.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	57	552	467	0.58	147
1 - 3	171	736	593	0.88	199
3 - 4.3	0.11	1790	653	1.7	173

KKR-21-056

578.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	14	180	223	0.36	159
1 - 2.9	88	694	494	0.63	284

KKR-22-006

577.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1.3	183	450	590	0.44	204

KKR-21-055

577.7 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.8	17.9	166	166	0.14	435

KKR-20-031

579.1 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	49	169	321	0.39	128
1 - 3	280	840	716	1.3	150
3 - 4.7	21	844	460	0.87	94.8

KKR-21-054

579.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0.6 - 0.9	7.8	84.6	201	0.13	24.5

KKR-21-55A

577.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0.5 - 1.2	19.8	132	247	0.27	67.8

KKR-20-032

577.9 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	22.9	180	425	0.37	161
1 - 3	86	569	535	0.76	180
3 - 5	7.6	1370	984	1.3	267
5 - 6.6	0.0041	3610	196	0.5	89.6

KKR-22-007

574.4 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	3.14	70	140	0.2	57.1
1 - 2	18.8	440	530	0.37	181
5 - 6	36.2	280	470	0.45	187
6 - 7	32.4	250	410	0.59	169
7 - 8.2	1.81	470	390	1.4	311
10 - 11	0.7	1400	1100	1.1	226
11 - 12	0.7	570	370	1.8	264
12 - 13	0.7	860	340	1.6	273
13 - 14.2	0.7	1800	380	1.5	295

KKR-22-004

573.3 / 16.1

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	8.3	97	210	0.2	70
1 - 2	13.4	150	360	0.25	117
2 - 3	14.5	960	1000	0.42	267
3 - 3.9	59.9	180	620	0.51	186
5 - 6	0.35	10000	570	1.5	96.7
6 - 7	0.9	11000	250	1.4	126
7 - 8	0.85	7500	240	1.3	149
8 - 8.8	0.9	2300	200	1.4	226
10 - 11	1.05	13000	550	3.3	201

KKR-22-008

574.4 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	19.9	150	250	0.25	71.9
1 - 2	14.3	670	640	0.38	127
2 - 2.7	124	330	610	0.57	176
5 - 6	34.3	300	400	0.8	185
6 - 7	26	730	500	1.3	194
7 - 7.8	0.85	1300	620	0.46	283
10 - 11	1.2	8600	800	1.2	258
11 - 12	1.5	46000	3000	2.2	287
12 - 13.2	1.65	57000	7400	3.8	281

KKR-22-005

575.4 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	25.8	200	330	0.3	87.1
1 - 2	135	500	650	0.7	274
2 - 2.5	221	470	540	0.65	229
5 - 6	63.4	380	440	0.84	204
6 - 7	6.96	5200	810	1.3	204
7 - 8	1.4	16000	2200	2.4	252
10 - 11	0.467	19000	1600	2	164
11 - 12	1.85	13000	1400	2.8	171
12 - 13	1.3	24000	510	2.8	134

Kinnickinnic River

Direction of Flow

KK-SDA14

KK-SDA22

KKR-22-001

KKR-20-033

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Shoreline Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

N

0 25 50

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID

Mudline Elevation

Native Material Depth	Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
		<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered, PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)

Figure 5-1J
Grand Trunk Slip Detail
Alternative 2 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 1

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)
3. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

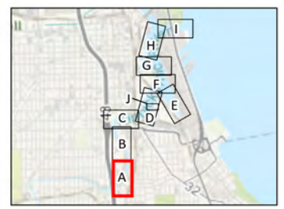
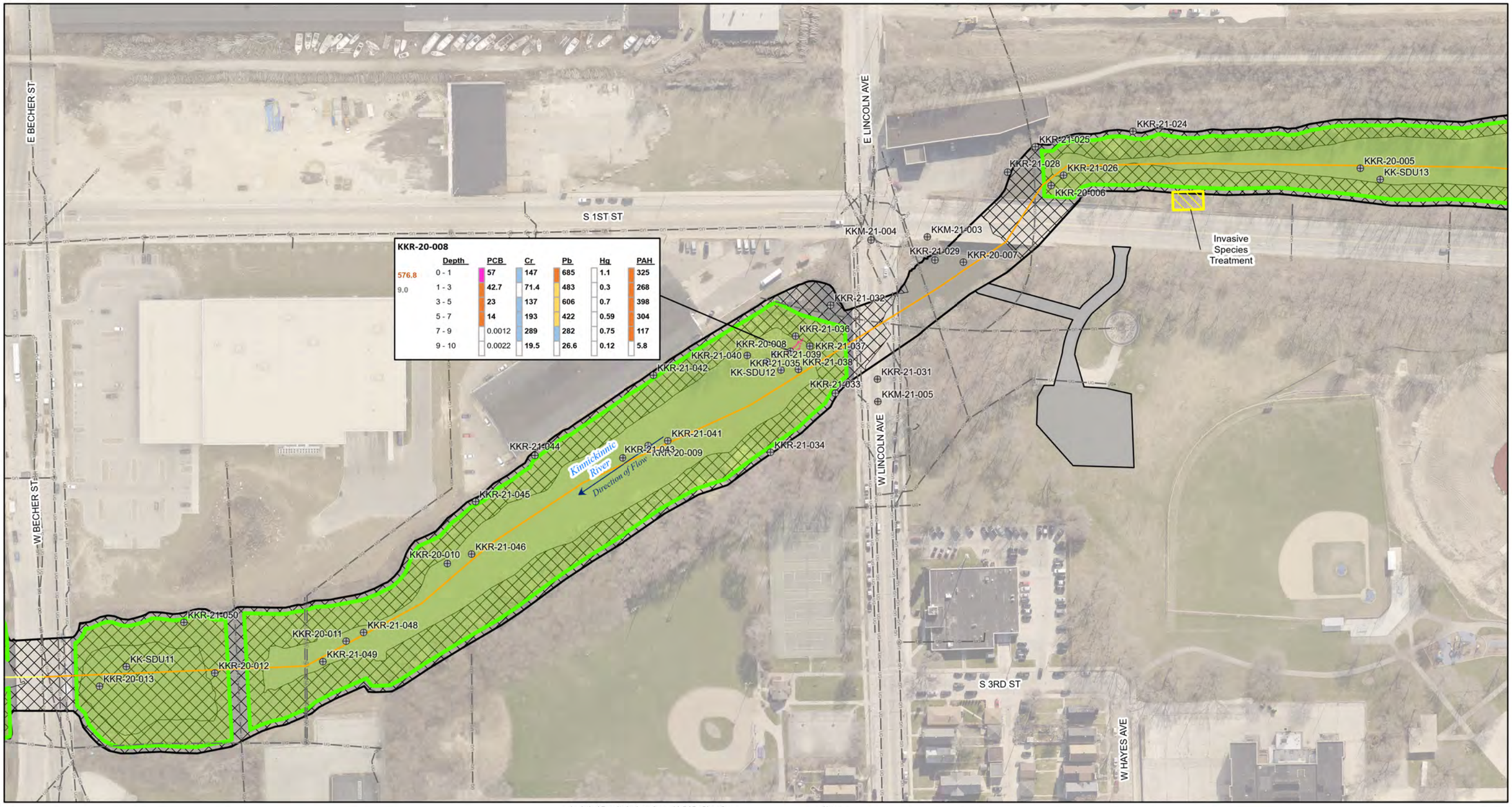


Figure 5-2A
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2

N

0 75 150

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID				
Mudline Elevation		PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	Depth	<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)
4. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

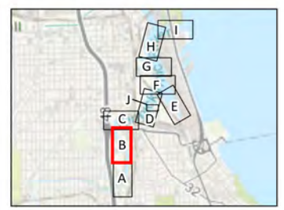
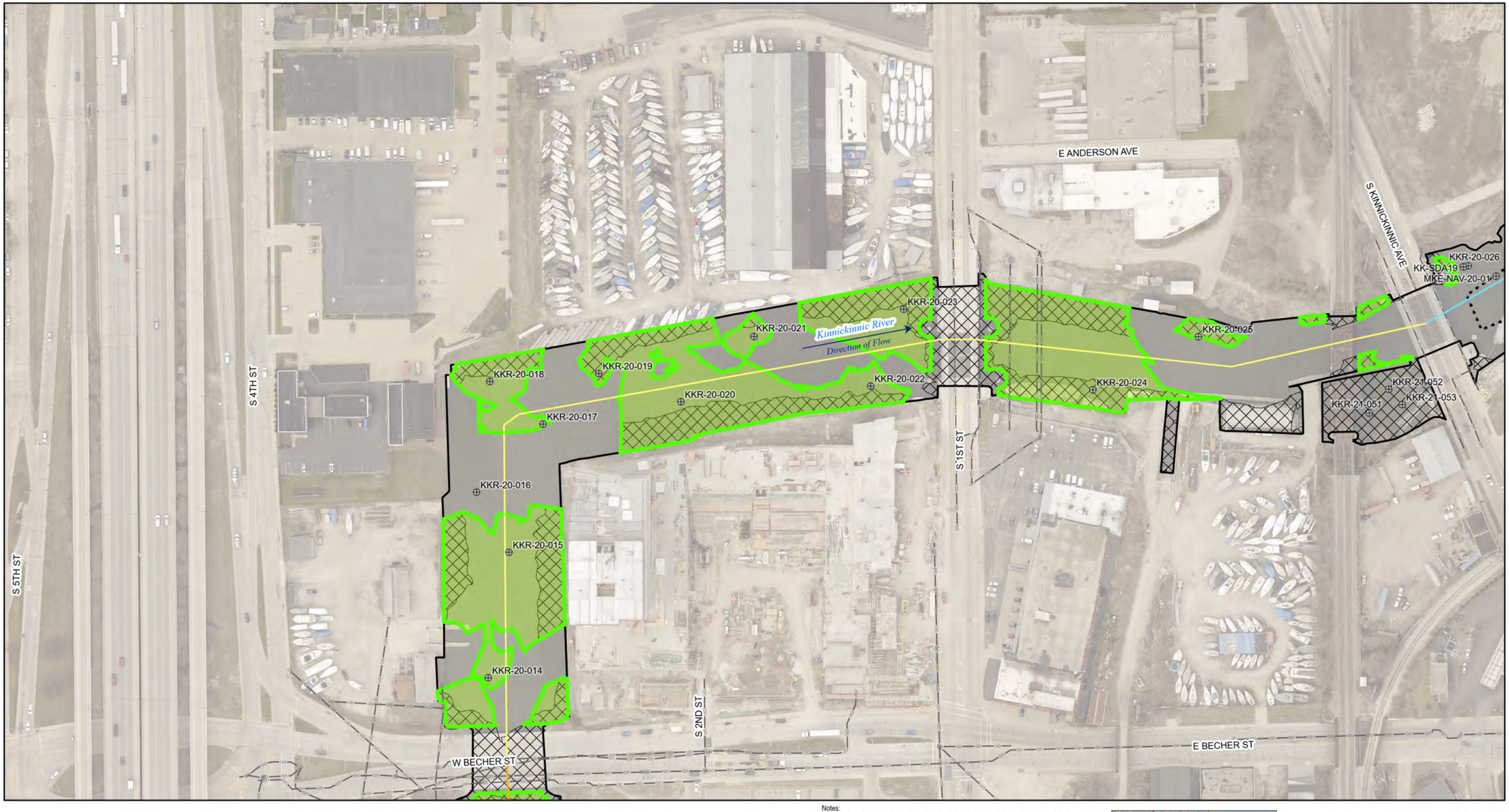


Figure 5-2B
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

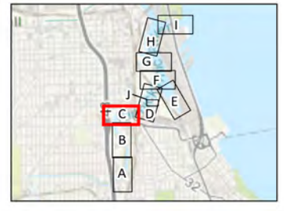


Figure 5-2C
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

See Figure 5-2J

Municipal Slip

Grand Trunk Slip

Car Ferry Slip - We Energies Remedial Action

Kinnickinnic River

Direction of Flow

KKR-20-031 KKR-21-054 KKR-21-55A KKR-21-055 KKR-22-006 MK-KKR-22-006 KKR-21-056 KKR-20-032 KKR-21-057 KKR-22-003 MK-KKR-22-003 KKR-22-005 MK-KKR-22-005 KKR-22-008 MK-KKR-22-008 KK-SDA23 MK-KKR-22-002 KKR-22-002 MK-KKR-22-004 KKR-22-004 MK-KKR-22-007 KKR-22-007 KKR-22-001 MK-KKR-22-001 KKR-20-033 KKR-20-038 KKR-20-039 KKR-20-041 KKR-20-040 KKR-20-043 KK-SDA16A KK-SDA25 KKR-20-036 KKR-20-035 KK-SDA14 KK-SDA22 KKR-20-030 MKE-NAV-20-12A MKE-NAV-20-12B MKE-NAV-20-10 MKE-NAV-20-08 MKE-NAV-20-06 KK-SDA21 MKE-NAV-20-11 MKE-NAV-20-09 MKE-NAV-20-07 KKR-20-042 KR01 KR02 KK-SDA26 KR03 KK-SDA15 KKR-20-037 KK-SDA13A KK-SDA13 KKR-20-034 MKE-NAV-20-05 KK-SDA20 KK-SDA24 KR04 MKE-NAV-20-04 KKR-20-029 MKE-NAV-20-03 KKR-20-027 KK-SDA12 KKR-20-028 MKE-NAV-20-02 KK-SDA11 MKE-NAV-20-01 KKR-20-026 KK-SDA19 KKR-21-053 KKR-21-052

S ALLIS ST

E STEWART ST

S HILBERT ST

S KINNICKINNIC AVE

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Shoreline Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 2
- Reach 3

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

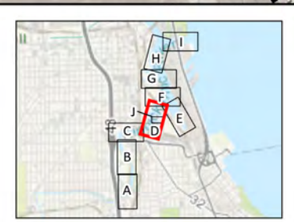


Figure 5-2D
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

S HARBOR DR

S CARFERRY DR

KKMB-SD-004B

KKMB-SD-004

KKR-20-056

KKR-20-055

KKMB-SD-005

KKR-20-053

KKMB-SD-006

KKMB-SD-007

KKR-20-052

KKR-20-054

Kinnickinnic Turning Basin

KKMB-SD-010

KKMB-SD-008

KKMB-SD-009

KKR-20-051

KKR-20-049

KKR-20-050

KKR-20-048

LEGEND

- Analytical Sample Location
- Underground Utility
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

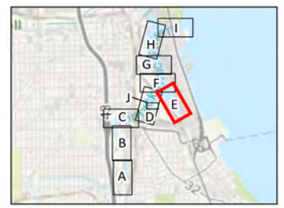


Figure 5-2E
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

MKE-NAV-20-19
MKE-NAV-20-18
KK-SDA18A
KKMB-SD-002
MKE-NAV-20-17
MKE-NAV-20-16
KKR-20-057
KKR-20-045
MKE-NAV-20-15
KKMB-SD-003
MKE-NAV-20-14B
Kinnickinnic River
Direction of Flow
Kinnickinnic
Turning Basin
KK-SDA27
MKE-NAV-20-13
KKMB-SD-013
KK-SDA28
KKR-20-046
KKR-20-044
KK-SDA17A
Railroad
Bridge
KKMB-SD-012
KKMB-SD-011
KKR-20-047
KKR-20-056
KR01
KKR-20-043
MKE-NAV-20-12A
KKMB-SD-004B
KKMB-SD-004
S HARBOR DR
S CARFERRY DR

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 3
- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

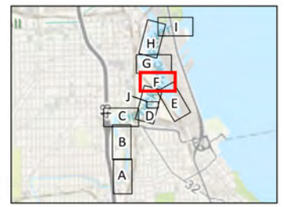
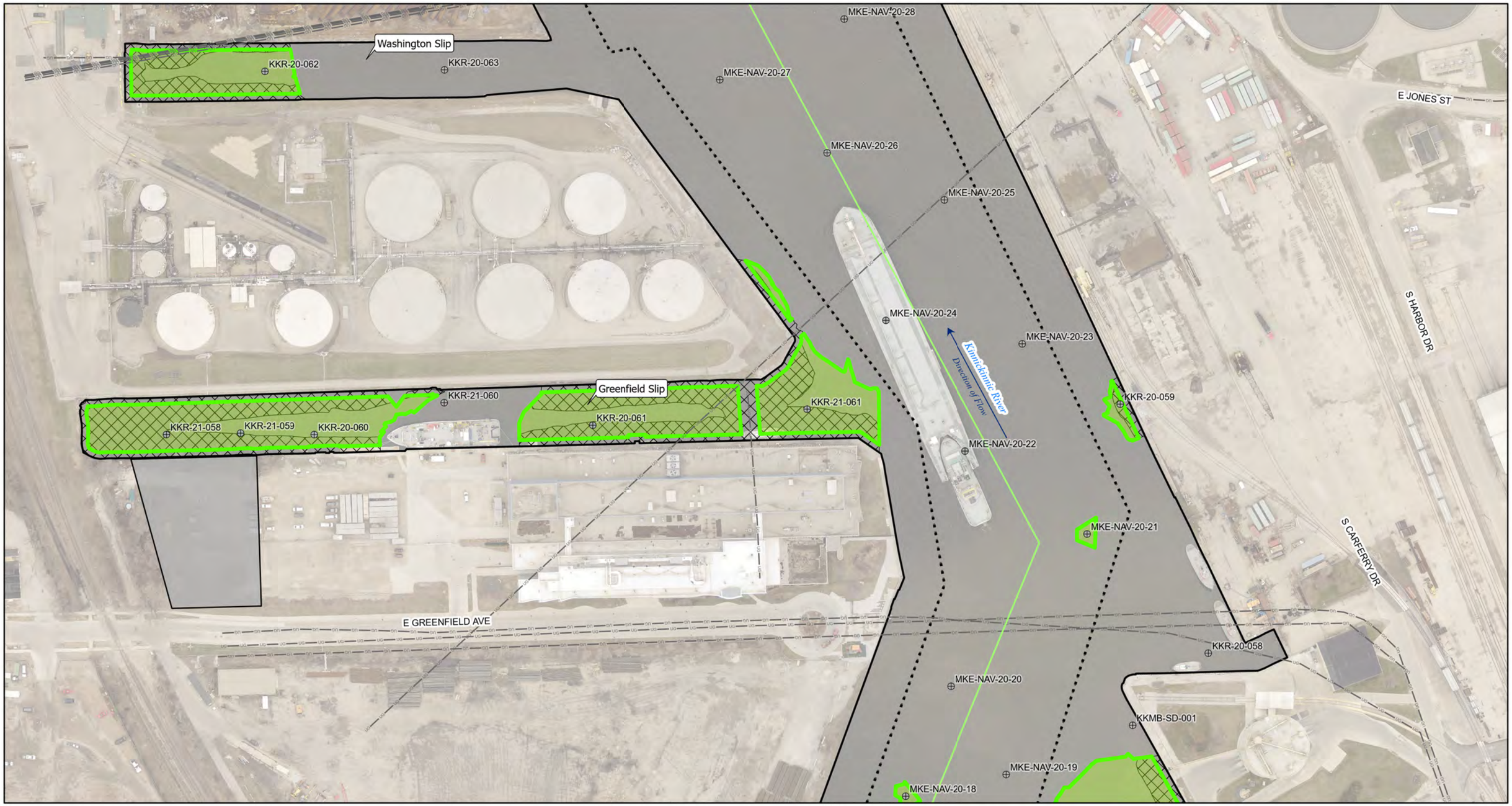


Figure 5-2F
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

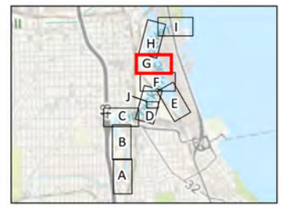
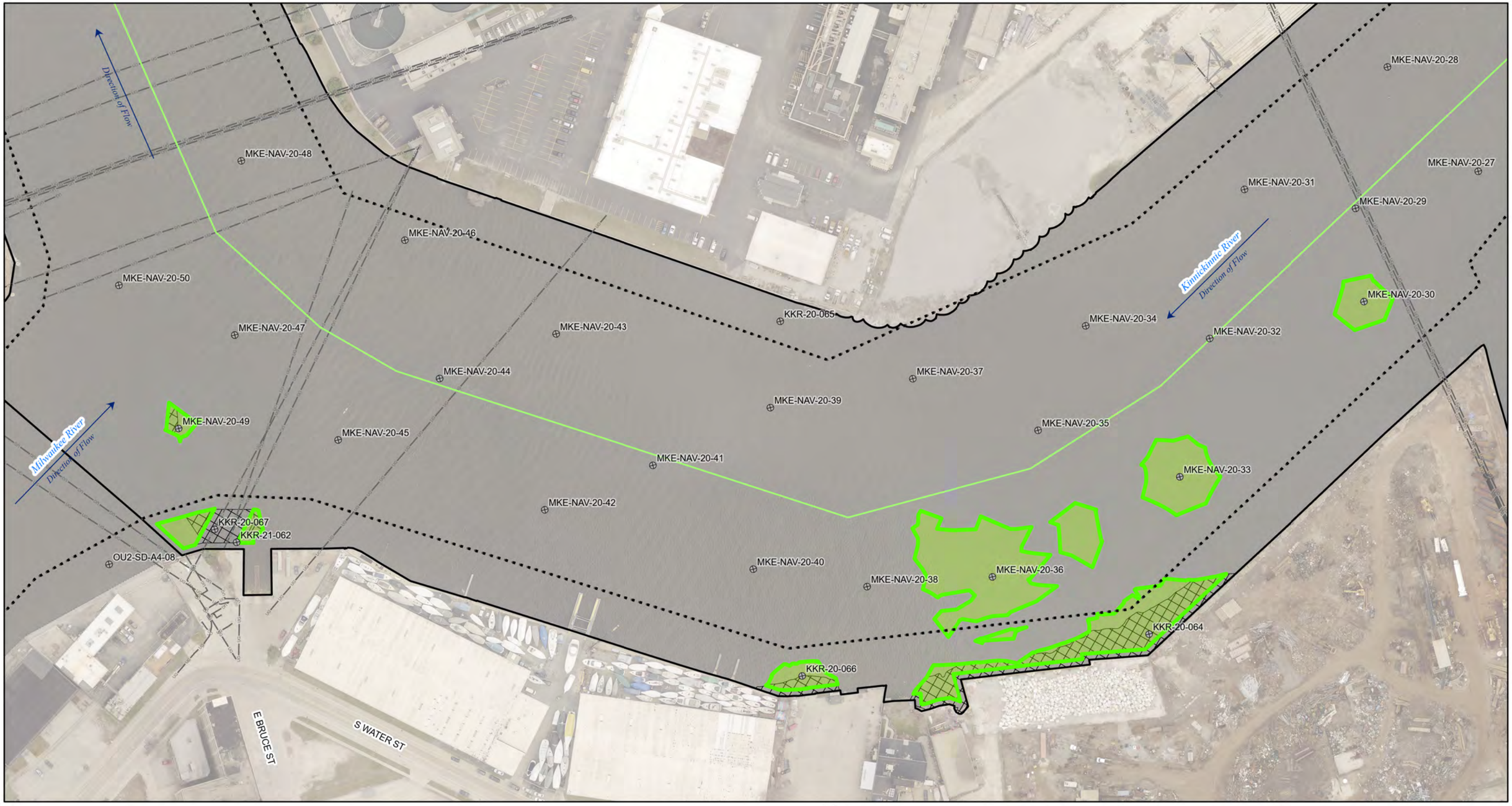


Figure 5-2G
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

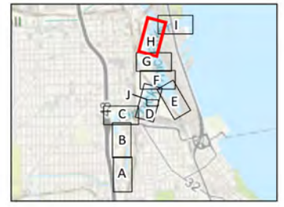
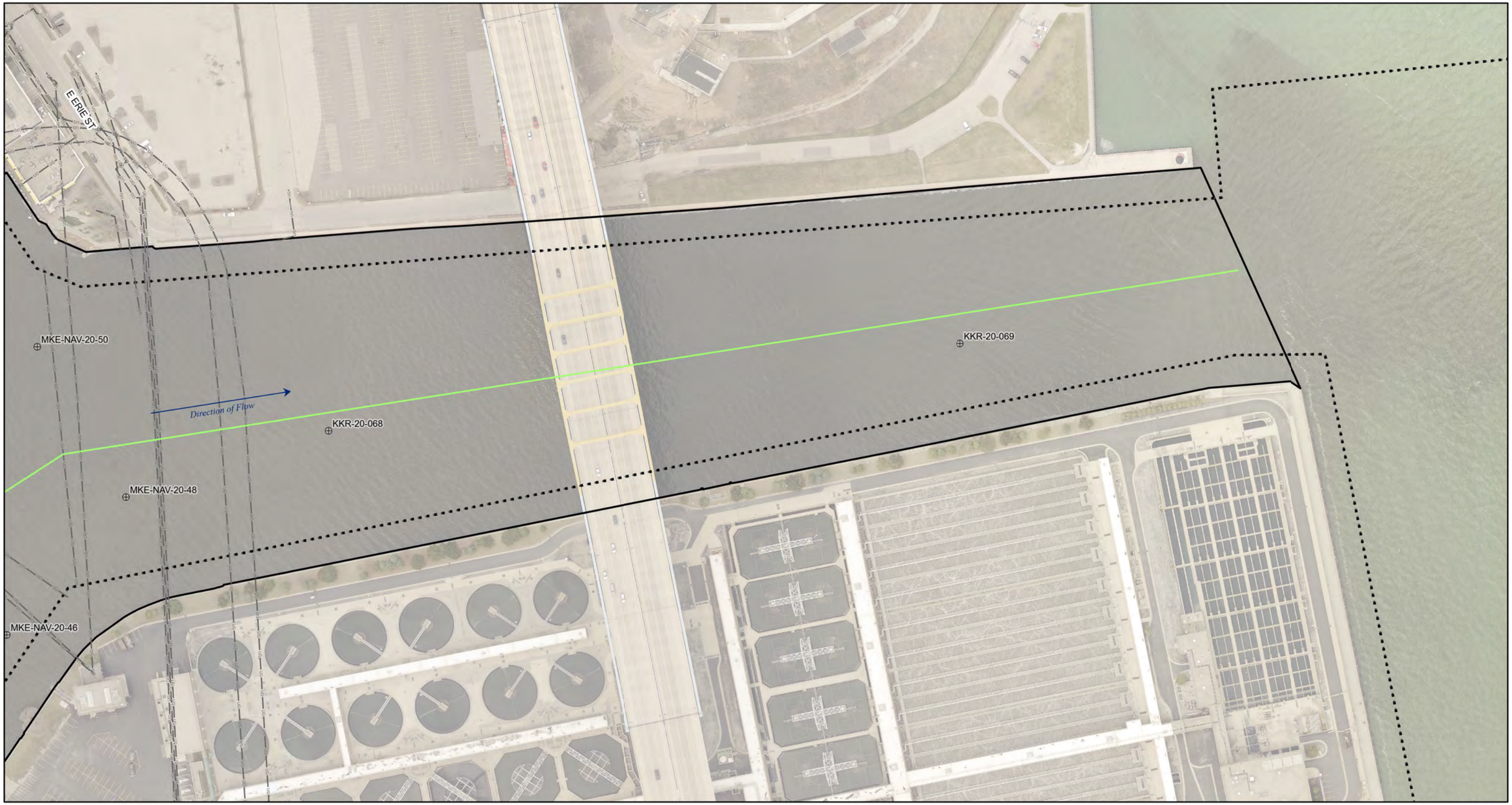


Figure 5-2H
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

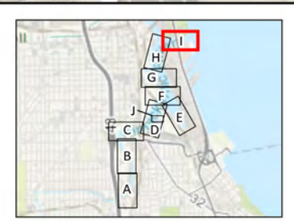


Figure 5-2I
Kinnickinnic River Site Features - Alternative 3 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-22-002

	Depth	PCB	Cr	Pb	Hg	PAH
576.1	0 - 1	8.7	130	320	0.26	74.6
NE	1 - 2	28.9	340	610	0.42	223
	2 - 3	17.9	770	420	0.76	211
	3 - 3.8	0.65	540	240	1.2	148
	5 - 6	0.85	32	170	0.39	32

KK-SDA23

	Depth	Cr	Pb	Hg	PAH
574.4	0 - 0.3	130	270	0.27	92
	0.3 - 2	220	530	0.34	128
	4 - 6	21000	1500	1.5	174
	6 - 8	40000	1200	2.5	101
	8 - 10	28000	590	2.7	132
	12 - 14	30000	440	2.1	107
	14 - 16	11000	240	1.1	66.4
	16 - 18	27	9.1	0.014	0.49
	20 - 21	37	10	0.015	0.096

KKR-22-003

	Depth	PCB	Cr	Pb	Hg	PAH
576.8	0 - 1	42	250	660	0.4	161
NE	1 - 2	59	1200	3600	1.1	223
	2 - 3.1	1.05	11000	470	1.1	302
	5 - 6	1.05	10000	270	1.4	113
	6 - 7	1.1	3100	210	0.7	154
	7 - 8	1	370	160	0.54	154
	10 - 11	1.05	27	57	0.25	16.4
	11 - 12	0.95	6.4	3.2	0.012	0.31
	12 - 13	0.85	11	5	0.014	1.81
	13 - 14	0.85	11	5.1	0.015	0.26

KKR-21-057

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1	57	552	467	0.58	147
NE	1 - 3	171	736	593	0.88	199
	3 - 4.3	0.11	1790	653	1.7	173

KKR-21-056

	Depth	PCB	Cr	Pb	Hg	PAH
578.8	0 - 1	14	180	223	0.36	159
NE	1 - 2.9	88	694	494	0.63	284

KKR-22-006

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1.3	183	450	590	0.44	204
NE						

KKR-21-055

	Depth	PCB	Cr	Pb	Hg	PAH
577.7	0 - 0.8	17.9	166	166	0.14	435
NE						

KKR-20-031

	Depth	PCB	Cr	Pb	Hg	PAH
579.1	0 - 1	49	169	321	0.39	128
NE	1 - 3	280	840	716	1.3	150
	3 - 4.7	21	844	460	0.87	94.8

KKR-21-054

	Depth	PCB	Cr	Pb	Hg	PAH
579.8	0.6 - 0.9	7.8	84.6	201	0.13	24.5
NE						

KKR-21-55A

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0.5 - 1.2	19.8	132	247	0.27	67.8
NE						

KKR-20-032

	Depth	PCB	Cr	Pb	Hg	PAH
577.9	0 - 1	22.9	180	425	0.37	161
NE	1 - 3	86	569	535	0.76	180
	3 - 5	7.6	1370	984	1.3	267
	5 - 6.6	0.0041	3610	196	0.5	89.6

KKR-22-007

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	3.14	70	140	0.2	57.1
NE	1 - 2	18.8	440	530	0.37	181
	5 - 6	36.2	280	470	0.45	187
	6 - 7	32.4	250	410	0.59	169
	7 - 8.2	1.81	470	390	1.4	311
	10 - 11	0.7	1400	1100	1.1	226
	11 - 12	0.7	570	370	1.8	264
	12 - 13	0.7	860	340	1.6	273
	13 - 14.2	0.7	1800	380	1.5	295

KKR-22-004

	Depth	PCB	Cr	Pb	Hg	PAH
573.3	0 - 1	8.3	97	210	0.2	70
16.1	1 - 2	13.4	150	360	0.25	117
	2 - 3	14.5	960	1000	0.42	267
	3 - 3.9	59.9	180	620	0.51	186
	5 - 6	0.35	10000	570	1.5	96.7
	6 - 7	0.9	11000	250	1.4	126
	7 - 8	0.85	7500	240	1.3	149
	8 - 8.8	0.9	2300	200	1.4	226
	10 - 11	1.05	13000	550	3.3	201

KKR-22-008

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	19.9	150	250	0.25	71.9
NE	1 - 2	14.3	670	640	0.38	127
	2 - 2.7	124	330	610	0.57	176
	5 - 6	34.3	300	400	0.8	185
	6 - 7	26	730	500	1.3	194
	7 - 7.8	0.85	1300	620	0.46	283
	10 - 11	1.2	8600	800	1.2	258
	11 - 12	1.5	46000	3000	2.2	287
	12 - 13.2	1.65	57000	7400	3.8	281

KKR-22-005

	Depth	PCB	Cr	Pb	Hg	PAH
575.4	0 - 1	25.8	200	330	0.3	87.1
NE	1 - 2	135	500	650	0.7	274
	2 - 2.5	221	470	540	0.65	229
	5 - 6	63.4	380	440	0.84	204
	6 - 7	6.96	5200	810	1.3	204
	7 - 8	1.4	16000	2200	2.4	252
	10 - 11	0.467	19000	1600	2	164
	11 - 12	1.85	13000	1400	2.8	171
	12 - 13	1.3	24000	510	2.8	134

Kinnickinnic River

Direction of Flow

KK-SDA14

KK-SDA22

KKR-22-001

KKR-20-033

KKR-20-034

KKR-20-035

KKR-20-036

KKR-20-037

KKR-20-038

KKR-20-039

KKR-20-040

KKR-20-041

KKR-20-042

KKR-20-043

KKR-20-044

KKR-20-045

KKR-20-046

KKR-20-047

KKR-20-048

KKR-20-049

KKR-20-050

KKR-20-051

KKR-20-052

KKR-20-053

KKR-20-054

KKR-20-055

KKR-20-056

KKR-20-057

KKR-20-058

KKR-20-059

KKR-20-060

KKR-20-061

KKR-20-062

KKR-20-063

KKR-20-064

KKR-20-065

KKR-20-066

KKR-20-067

KKR-20-068

KKR-20-069

KKR-20-070

KKR-20-071

KKR-20-072

KKR-20-004
KKR-20-003
Kinnickinnic River
Direction of Flow
Invasive Species Treatment
S 1ST ST
KKR-20-002
KK-SDU14
KKM-21-001
KKR-20-001
S CHASE AVE
KKR-21-021
Access by River
Boulders
KKR-21-020
Bank Stabilization
KKR-21-019
Rootwad Composites
KK-SDU15
W HARRISON AVE
S 3RD ST
W ROSEDALE AVE
E MONTANA ST

LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas
- Reach 1

0 75 150
Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)
3. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

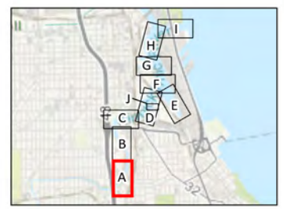
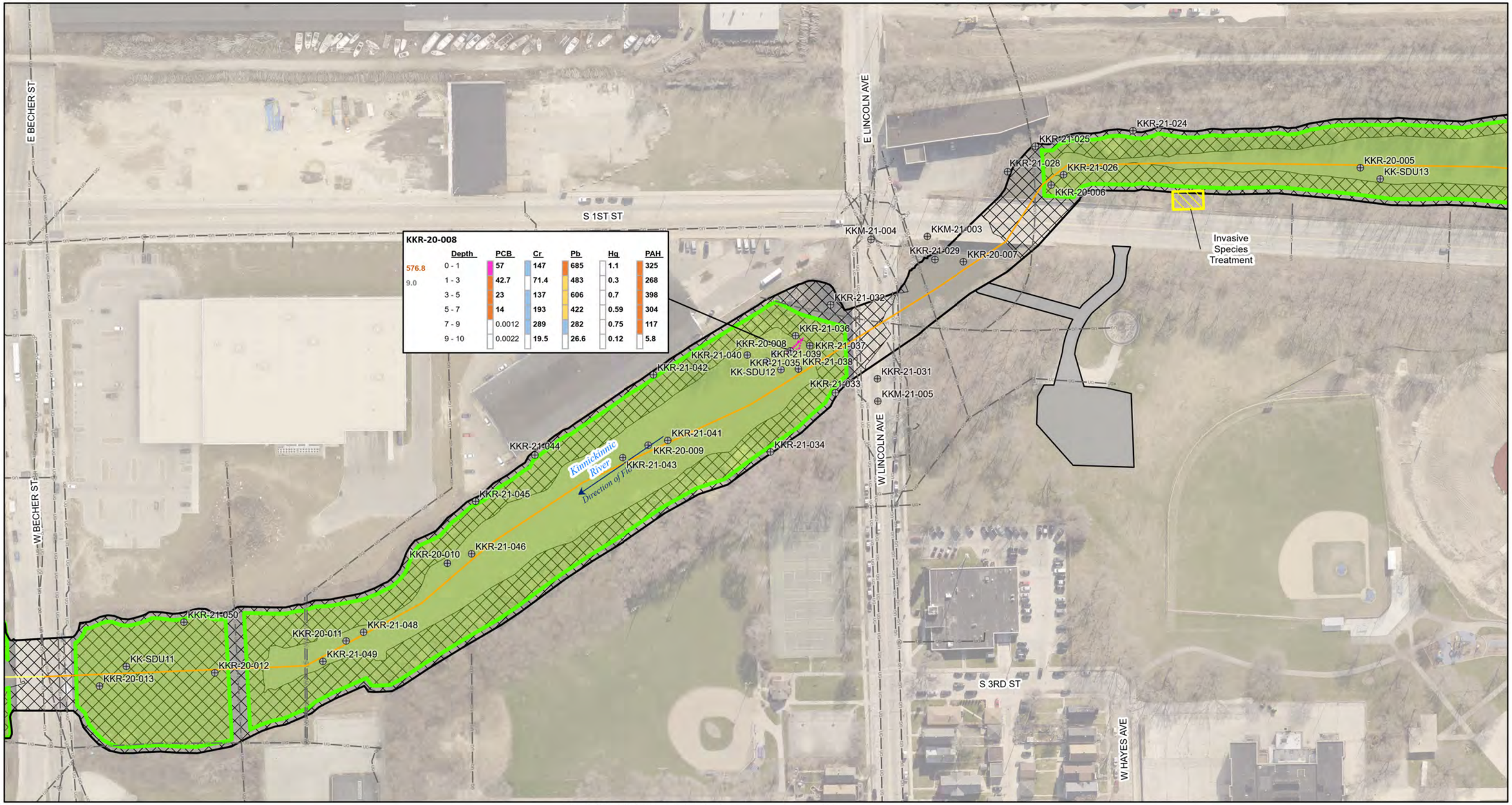


Figure 5-3A
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2

N

0 75 150

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID		PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Mudline Elevation				
Native Material Depth	Depth	<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

- = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)
4. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

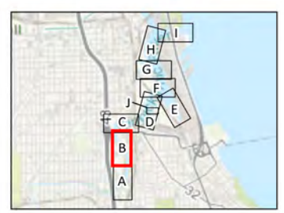
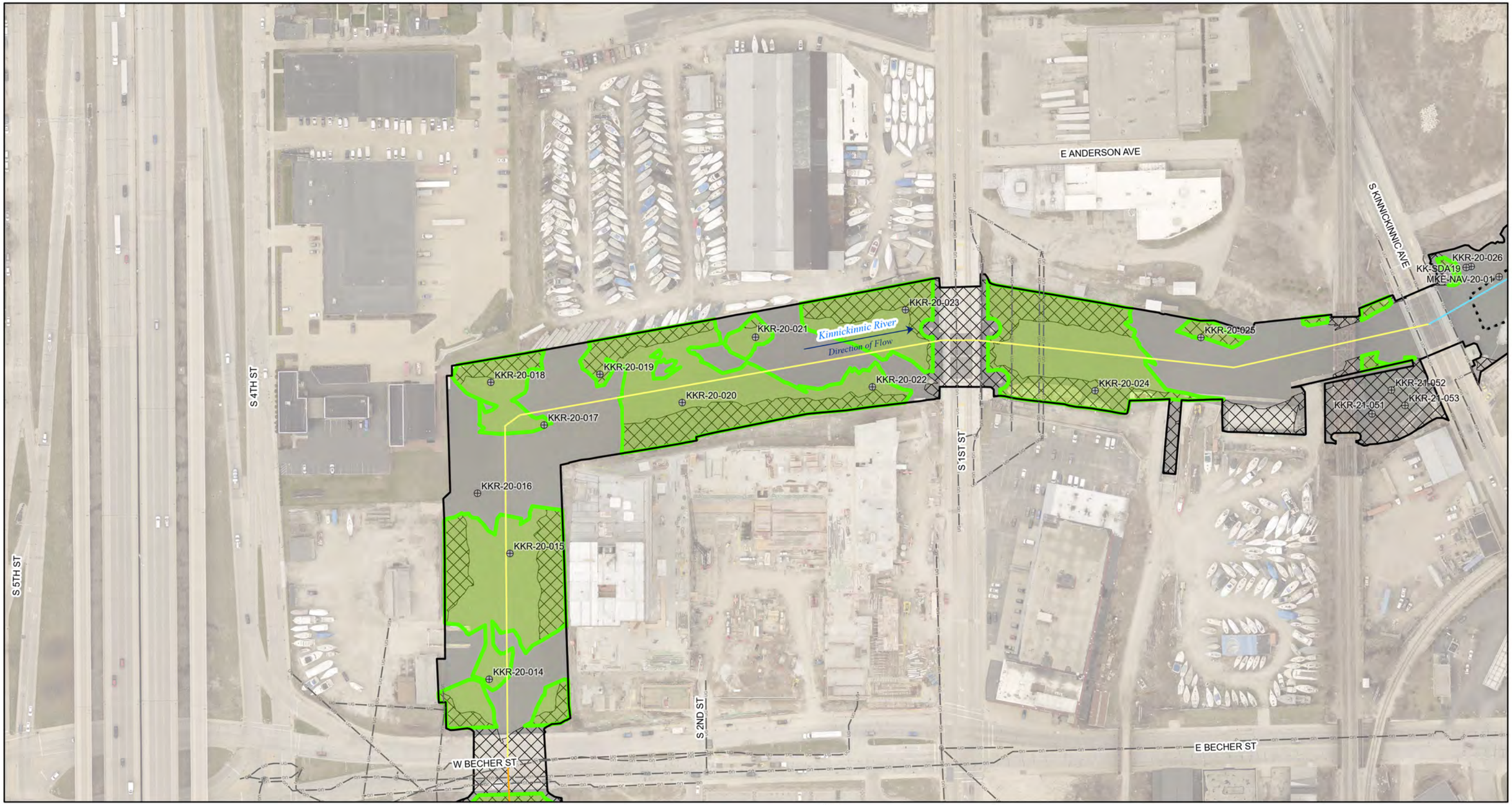


Figure 5-3B
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

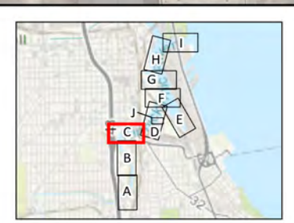
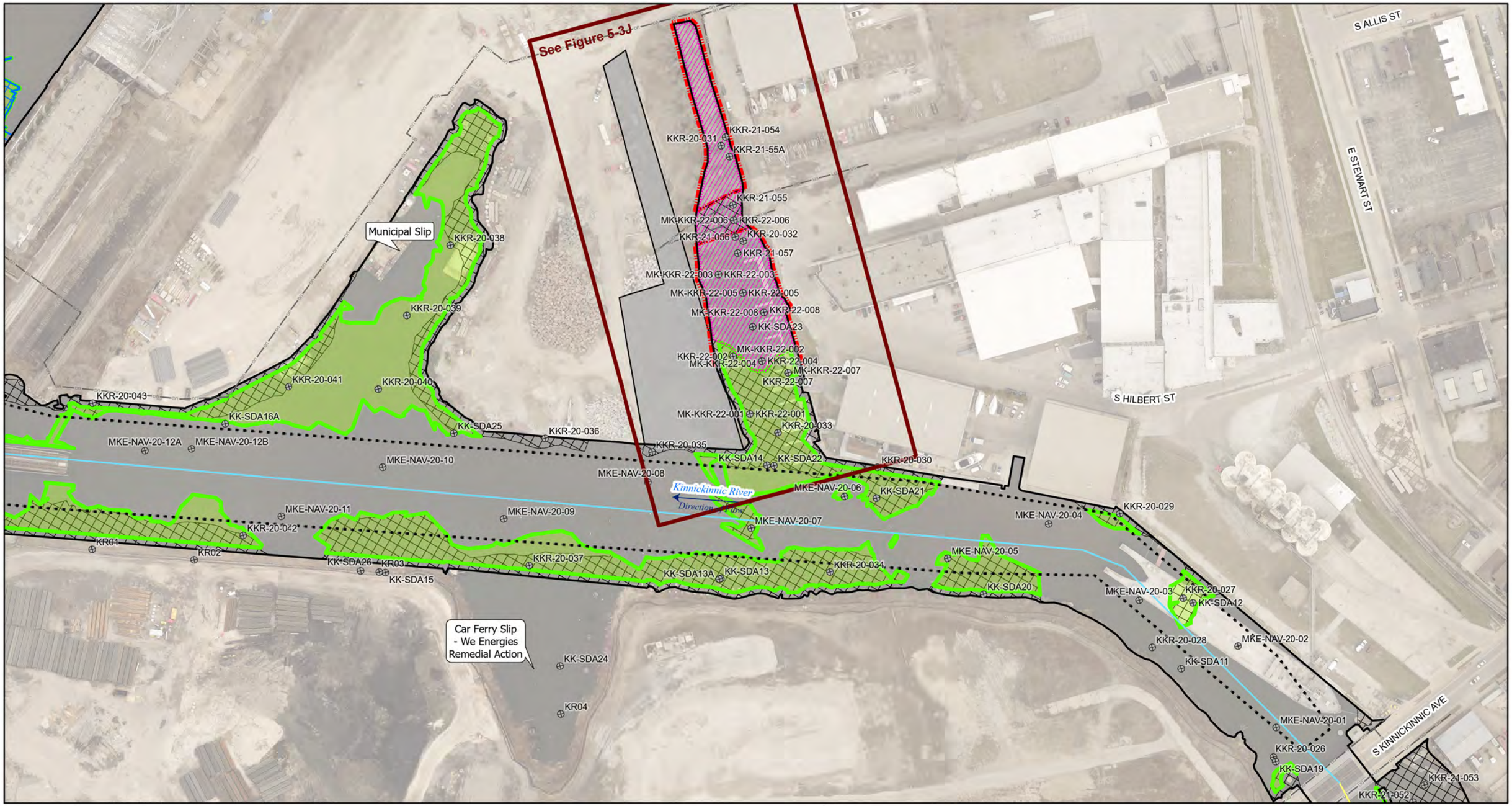


Figure 5-3C
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- Sand cover extent for Alternative 3A
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 2
- Reach 3

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

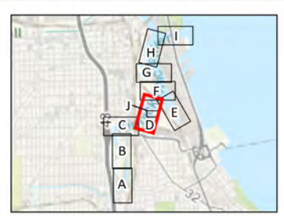


Figure 5-3D
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

S HARBOR DR

S CARFERRY DR

KKMB-SD-004B

KKMB-SD-004

KKR-20-056

KKR-20-055

KKMB-SD-005

KKR-20-053

KKMB-SD-006

KKMB-SD-007

KKR-20-052

KKR-20-054

Kinnickinnic Turning Basin

KKMB-SD-010

KKMB-SD-008

KKMB-SD-009

KKR-20-051

KKR-20-049

KKR-20-050

KKR-20-048

LEGEND

- Analytical Sample Location
- Underground Utility
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Sand cover extent for Alternative 3A

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

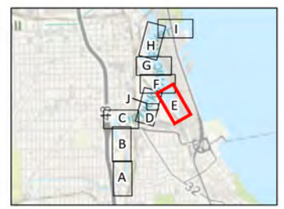


Figure 5-3E
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

MKE-NAV-20-19
MKE-NAV-20-18
KK-SDA18A
KKMB-SD-002
MKE-NAV-20-17
MKE-NAV-20-16
KKR-20-057
KKR-20-045
MKE-NAV-20-15
KKMB-SD-003
MKE-NAV-20-14B
Kinnickinnic River
Direction of Flow
Kinnickinnic Turning Basin
KK-SDA27
MKE-NAV-20-13
KKMB-SD-013
KK-SDA28
KKR-20-046
KKR-20-044
KK-SDA17A
Railroad Bridge
KKMB-SD-012
KKMB-SD-011
KKR-20-047
KKR-20-056
KR01
KKR-20-043
MKE-NAV-20-12A
KKMB-SD-004B
KKMB-SD-004
S HARBOR DR
S CARFERRY DR

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- Sand cover extent for Alternative 3A

Kinnickinnic River Reach Areas

- Reach 3
- Reach 4

N

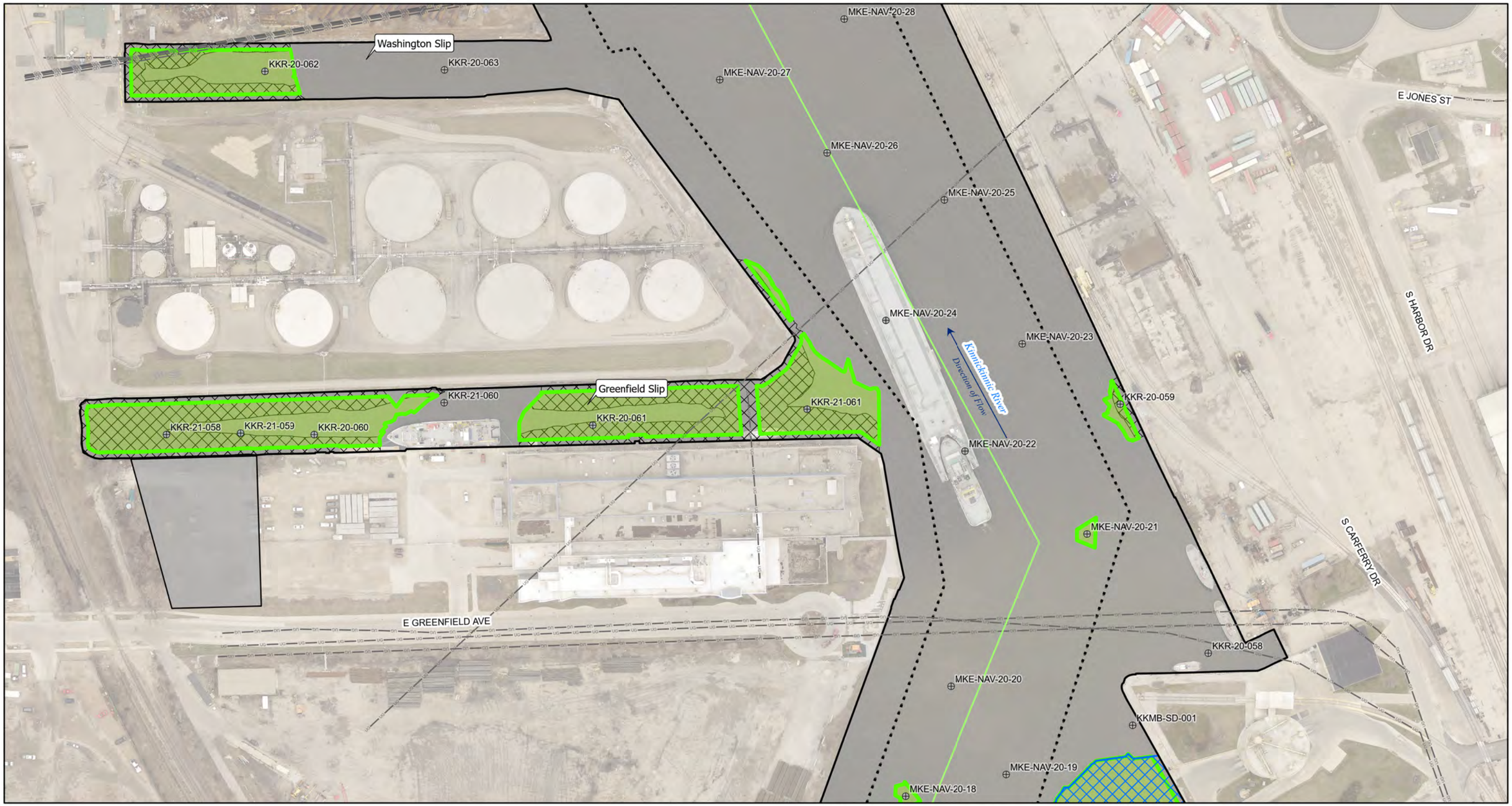
0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

Figure 5-3F
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- Sand cover extent for Alternative 3A

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

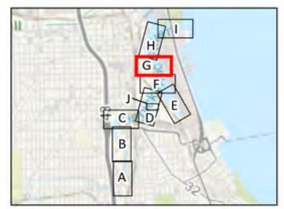


Figure 5-3G
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

MKE-NAV-20-28
MKE-NAV-20-27
MKE-NAV-20-31
MKE-NAV-20-29
MKE-NAV-20-30
MKE-NAV-20-32
MKE-NAV-20-34
MKE-NAV-20-33
MKE-NAV-20-35
MKE-NAV-20-36
MKE-NAV-20-37
MKE-NAV-20-38
MKE-NAV-20-39
MKE-NAV-20-40
MKE-NAV-20-41
MKE-NAV-20-42
MKE-NAV-20-43
MKE-NAV-20-44
MKE-NAV-20-45
MKE-NAV-20-46
MKE-NAV-20-47
MKE-NAV-20-48
MKE-NAV-20-49
MKE-NAV-20-50
KKR-20-065
KKR-20-064
KKR-20-066
KKR-20-067
KKR-21-062
OU2-SD-A4-08
Direction of Flow
Kinnickinnic River
Direction of Flow
Milwaukee River
Direction of Flow
E BRUCE ST
S WATER ST

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

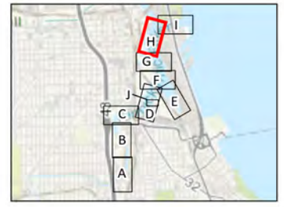
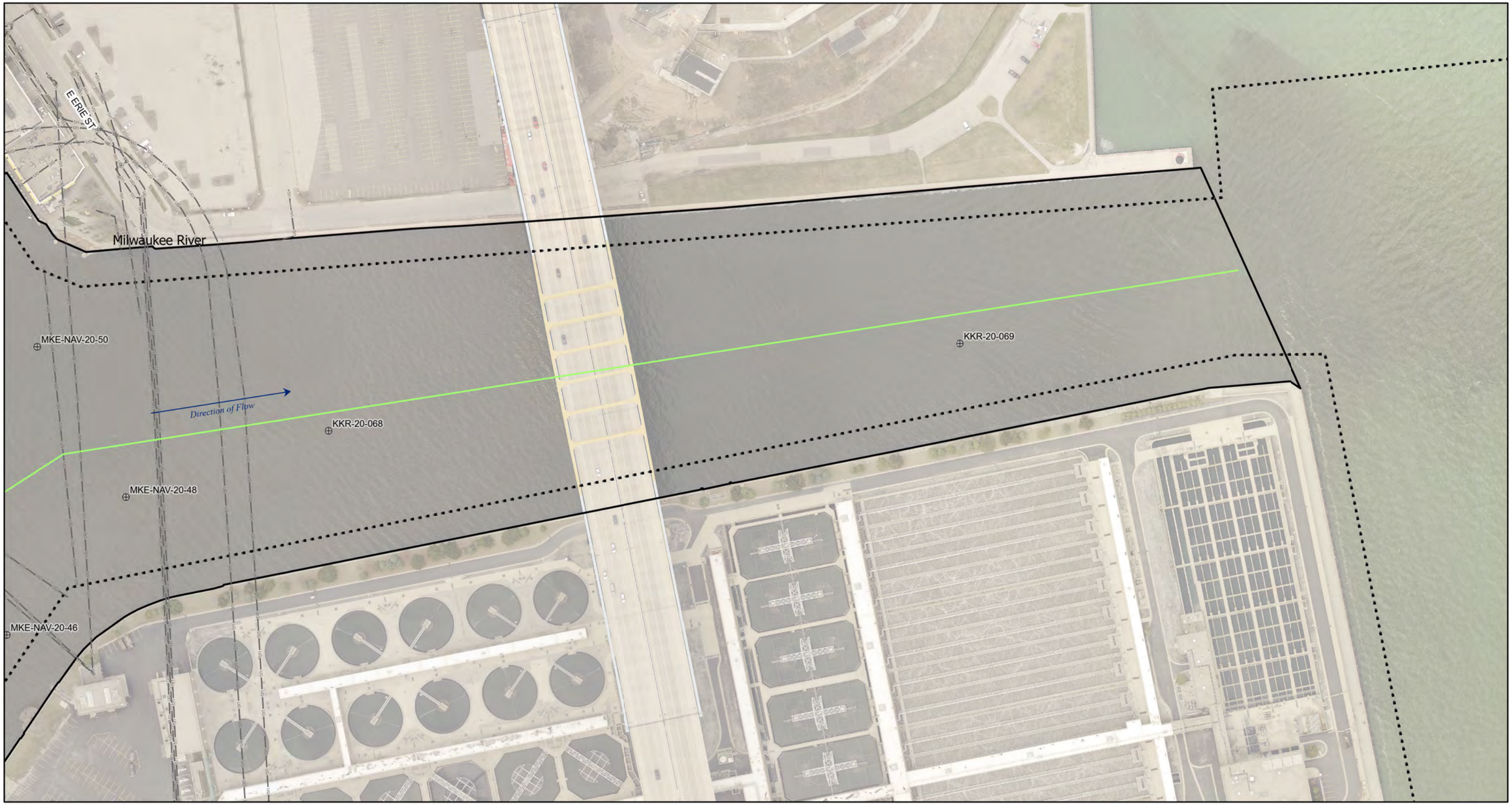


Figure 5-3H
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

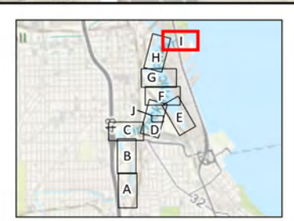


Figure 5-3I
Kinnickinnic River Site Features - Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-22-002

576.1 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	8.7	130	320	0.26	74.6
1 - 2	28.9	340	610	0.42	223
2 - 3	17.9	770	420	0.76	211
3 - 3.8	0.65	540	240	1.2	148
5 - 6	0.85	32	170	0.39	32

KK-SDA23

574.4

Depth	Cr	Pb	Hg	PAH
0 - 0.3	130	270	0.27	92
0.3 - 2	220	530	0.34	128
4 - 6	21000	1500	1.5	174
6 - 8	40000	1200	2.5	101
8 - 10	28000	590	2.7	132
12 - 14	30000	440	2.1	107
14 - 16	11000	240	1.1	66.4
16 - 18	27	9.1	0.014	0.49
20 - 21	37	10	0.015	0.096

KKR-22-003

576.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	42	250	660	0.4	161
1 - 2	59	1200	3600	1.1	223
2 - 3.1	1.05	11000	470	1.1	302
5 - 6	1.05	10000	270	1.4	113
6 - 7	1.1	3100	210	0.7	154
7 - 8	1	370	160	0.54	154
10 - 11	1.05	27	57	0.25	16.4
11 - 12	0.95	6.4	3.2	0.012	0.31
12 - 13	0.85	11	5	0.014	1.81
13 - 14	0.85	11	5.1	0.015	0.26

KKR-21-057

577.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	57	552	467	0.58	147
1 - 3	171	736	593	0.88	199
3 - 4.3	0.11	1790	653	1.7	173

KKR-21-056

578.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	14	180	223	0.36	159
1 - 2.9	88	694	494	0.63	284

KKR-22-006

577.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1.3	183	450	590	0.44	204

KKR-21-055

577.7 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.8	17.9	166	166	0.14	435

KKR-20-031

579.1 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	49	169	321	0.39	128
1 - 3	280	840	716	1.3	150
3 - 4.7	21	844	460	0.87	94.8

KKR-21-054

579.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0.6 - 0.9	7.8	84.6	201	0.13	24.5

KKR-21-55A

577.8 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0.5 - 1.2	19.8	132	247	0.27	67.8

KKR-20-032

577.9 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	22.9	180	425	0.37	161
1 - 3	86	569	535	0.76	180
3 - 5	7.6	1370	984	1.3	267
5 - 6.6	0.0041	3610	196	0.5	89.6

KKR-22-007

574.4 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	3.14	70	140	0.2	57.1
1 - 2	18.8	440	530	0.37	181
5 - 6	36.2	280	470	0.45	187
6 - 7	32.4	250	410	0.59	169
7 - 8.2	1.81	470	390	1.4	311
10 - 11	0.7	1400	1100	1.1	226
11 - 12	0.7	570	370	1.8	264
12 - 13	0.7	860	340	1.6	273
13 - 14.2	0.7	1800	380	1.5	295

KKR-22-004

573.3 / 16.1

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	8.3	97	210	0.2	70
1 - 2	13.4	150	360	0.25	117
2 - 3	14.5	960	1000	0.42	267
3 - 3.9	59.9	180	620	0.51	186
5 - 6	0.35	10000	570	1.5	96.7
6 - 7	0.9	11000	250	1.4	126
7 - 8	0.85	7500	240	1.3	149
8 - 8.8	0.9	2300	200	1.4	226
10 - 11	1.05	13000	550	3.3	201

KKR-22-008

574.4 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	19.9	150	250	0.25	71.9
1 - 2	14.3	670	640	0.38	127
2 - 2.7	124	330	610	0.57	176
5 - 6	34.3	300	400	0.8	185
6 - 7	26	730	500	1.3	194
7 - 7.8	0.85	1300	620	0.46	283
10 - 11	1.2	8600	800	1.2	258
11 - 12	1.5	46000	3000	2.2	287
12 - 13.2	1.65	57000	7400	3.8	281

KKR-22-005

575.4 / NE

Depth	PCB	Cr	Pb	Hg	PAH
0 - 1	25.8	200	330	0.3	87.1
1 - 2	135	500	650	0.7	274
2 - 2.5	221	470	540	0.65	229
5 - 6	63.4	380	440	0.84	204
6 - 7	6.96	5200	810	1.3	204
7 - 8	1.4	16000	2200	2.4	252
10 - 11	0.467	19000	1600	2	164
11 - 12	1.85	13000	1400	2.8	171
12 - 13	1.3	24000	510	2.8	134

KK-SDA14
KK-SDA22
KKR-22-001
KKR-20-033
Kinnickinnic River
Direction of Flow
JA DR

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

N

0 25 50

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID				
Mudline Elevation		PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	Depth	<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit
"-" = COC was not sampled/analyzed
NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered, PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)

Figure 5-3J
Grand Trunk Slip Detail
Alternative 3A Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas
- Reach 1

0 75 150
Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)
3. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

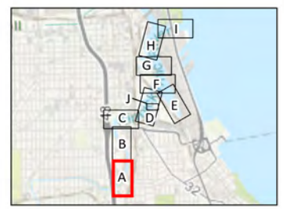
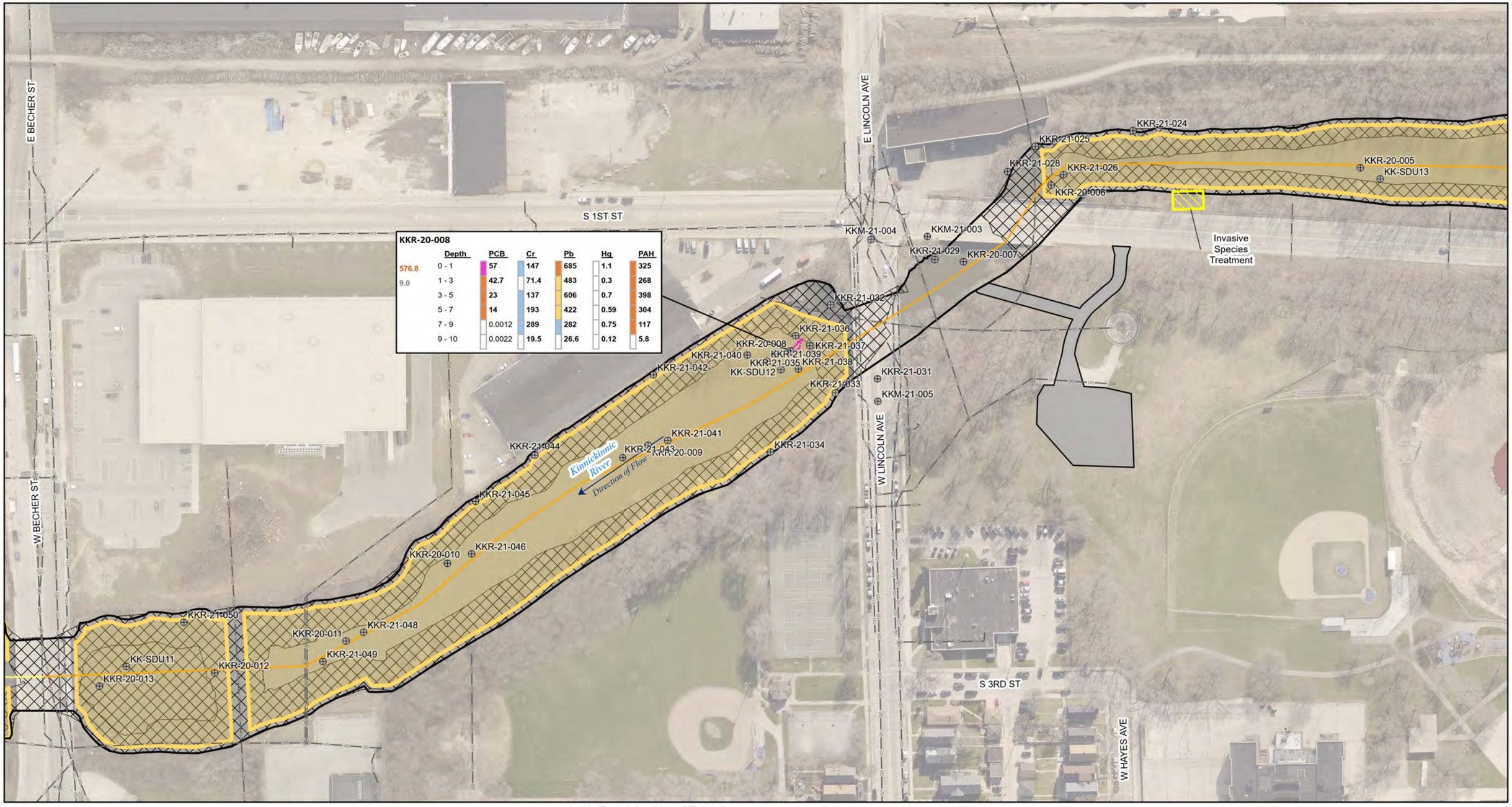


Figure 5-4A
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Habitat restoration activity features per Montgomery 2018
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2

N

0 75 150

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID		PCBs	Metals	PAHs
Mudline Elevation	Depth	(mg/kg)	(mg/kg)	(mg/kg)
Native Material Depth		<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)
4. Montgomery Associates Resource Solutions LLC (Montgomery) 2018. Kinnickinnic River I-94 to Becher Street Habitat Restoration Project Final Design Report. September.

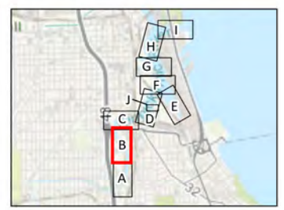
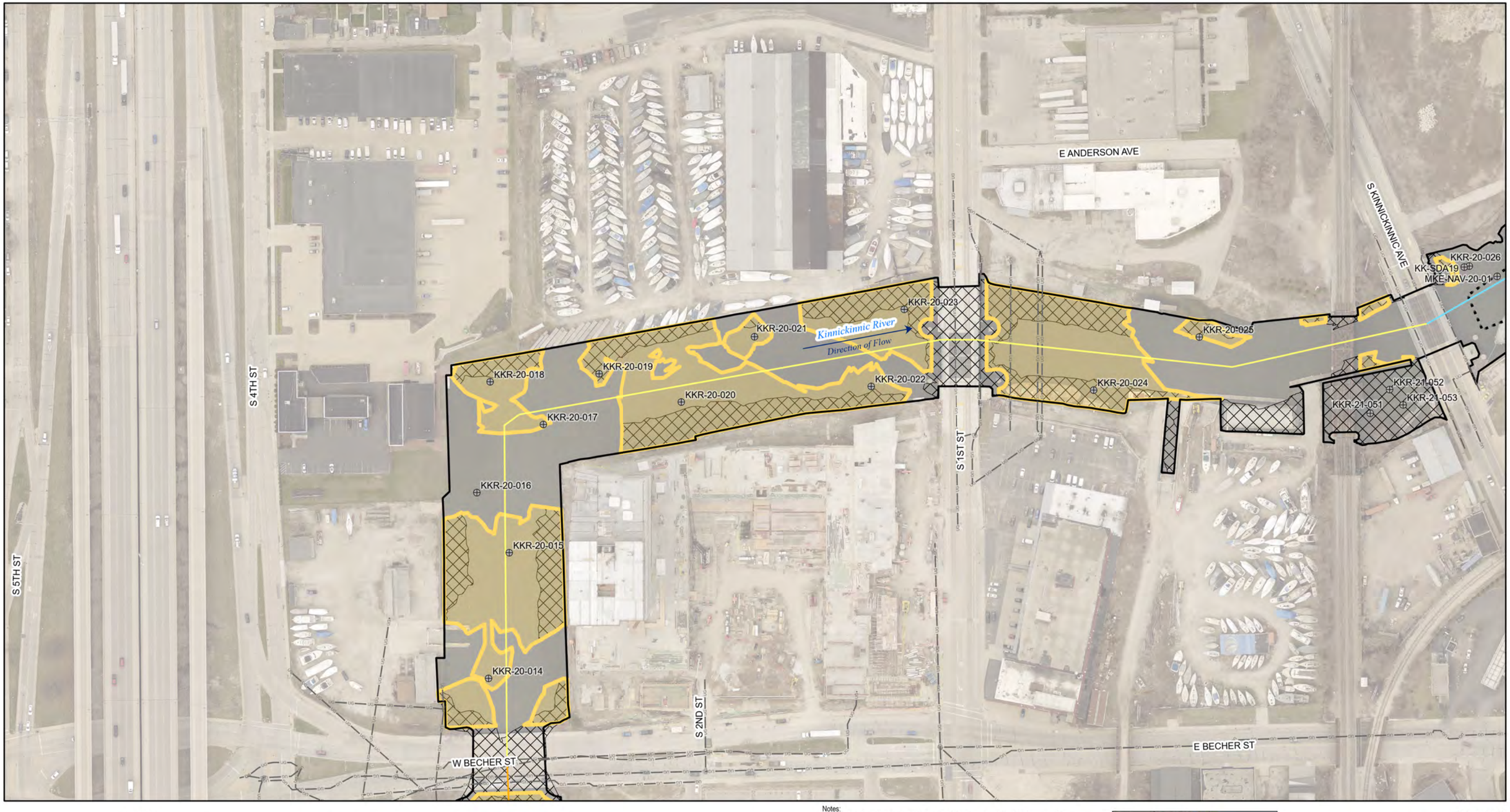


Figure 5-4B
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

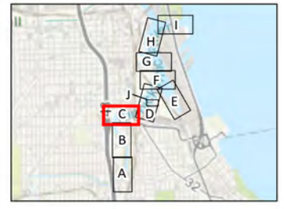


Figure 5-4C
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

See Figure 5-3J

Municipal Slip

Grand Trunk Slip

Car Ferry Slip - We Energies Remedial Action

Kinnickinnic River

Direction of Flow

S ALLIS ST

E STEWART ST

S HILBERT ST

S KINNICKINNIC AVE

KKR-20-031 KKR-21-054 KKR-21-55A KKR-21-055 KKR-22-006 MK-KKR-22-006 KKR-21-056 KKR-20-032 KKR-21-057 KKR-22-003 MK-KKR-22-003 KKR-22-005 MK-KKR-22-005 KKR-22-008 MK-KKR-22-008 KK-SDA23 MK-KKR-22-002 KKR-22-002 MK-KKR-22-004 KKR-22-004 MK-KKR-22-007 KKR-22-007 KKR-22-001 MK-KKR-22-001 KKR-20-033 KKR-20-038 KKR-20-039 KKR-20-041 KKR-20-040 KKR-20-043 KK-SDA16A KK-SDA25 KKR-20-036 KKR-20-035 KK-SDA14 KK-SDA22 KKR-20-030 MKE-NAV-20-12A MKE-NAV-20-12B MKE-NAV-20-10 MKE-NAV-20-08 MKE-NAV-20-06 KK-SDA21 KKR-20-029 MKE-NAV-20-11 MKE-NAV-20-09 MKE-NAV-20-07 MKE-NAV-20-04 KKR-20-042 KR01 KR02 KK-SDA26 KR03 KK-SDA15 KKR-20-037 KK-SDA13A KK-SDA13 KKR-20-034 MKE-NAV-20-05 KK-SDA20 MKE-NAV-20-03 KKR-20-027 KK-SDA12 KKR-20-028 MKE-NAV-20-02 KK-SDA11 KK-SDA24 KR04 MKE-NAV-20-01 KKR-20-026 KK-SDA19 KKR-21-053 KKR-21-052

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Shoreline Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

Kinnickinnic River Reach Areas

- Reach 2
- Reach 3

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

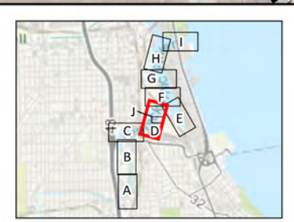


Figure 5-4D
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

S HARBOR DR

S CARFERRY DR

KKMB-SD-004B

KKMB-SD-004

KKR-20-056

KKR-20-055

KKMB-SD-005

KKR-20-053

KKMB-SD-006

KKMB-SD-007

KKR-20-052

KKR-20-054

Kinnickinnic Turning Basin

KKMB-SD-010

KKMB-SD-008

KKMB-SD-009

KKR-20-051

KKR-20-049

KKR-20-050

KKR-20-048

LEGEND

- Analytical Sample Location
- Underground Utility
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

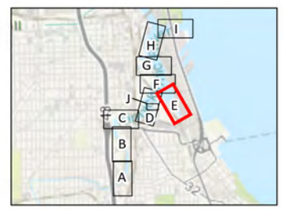


Figure 5-4E
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

MKE-NAV-20-19
MKE-NAV-20-18
KK-SDA18A
KKMB-SD-002
MKE-NAV-20-17
MKE-NAV-20-16
KKR-20-057
KKR-20-045
MKE-NAV-20-15
KKMB-SD-003
MKE-NAV-20-14B
Kinnickinnic River
Direction of Flow
Kinnickinnic Turning Basin
KK-SDA27
MKE-NAV-20-13
KKMB-SD-013
KK-SDA28
KKR-20-046
KKR-20-044
KK-SDA17A
Railroad Bridge
KKMB-SD-012
KKMB-SD-011
KKR-20-047
KKR-20-056
KR01
KKR-20-043
MKE-NAV-20-12A
KKMB-SD-004B
KKMB-SD-004
S HARBOR DR
S CARFERRY DR

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas
- Reach 3
- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

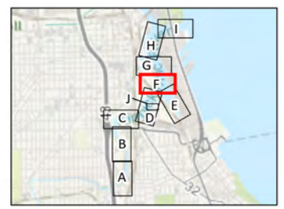
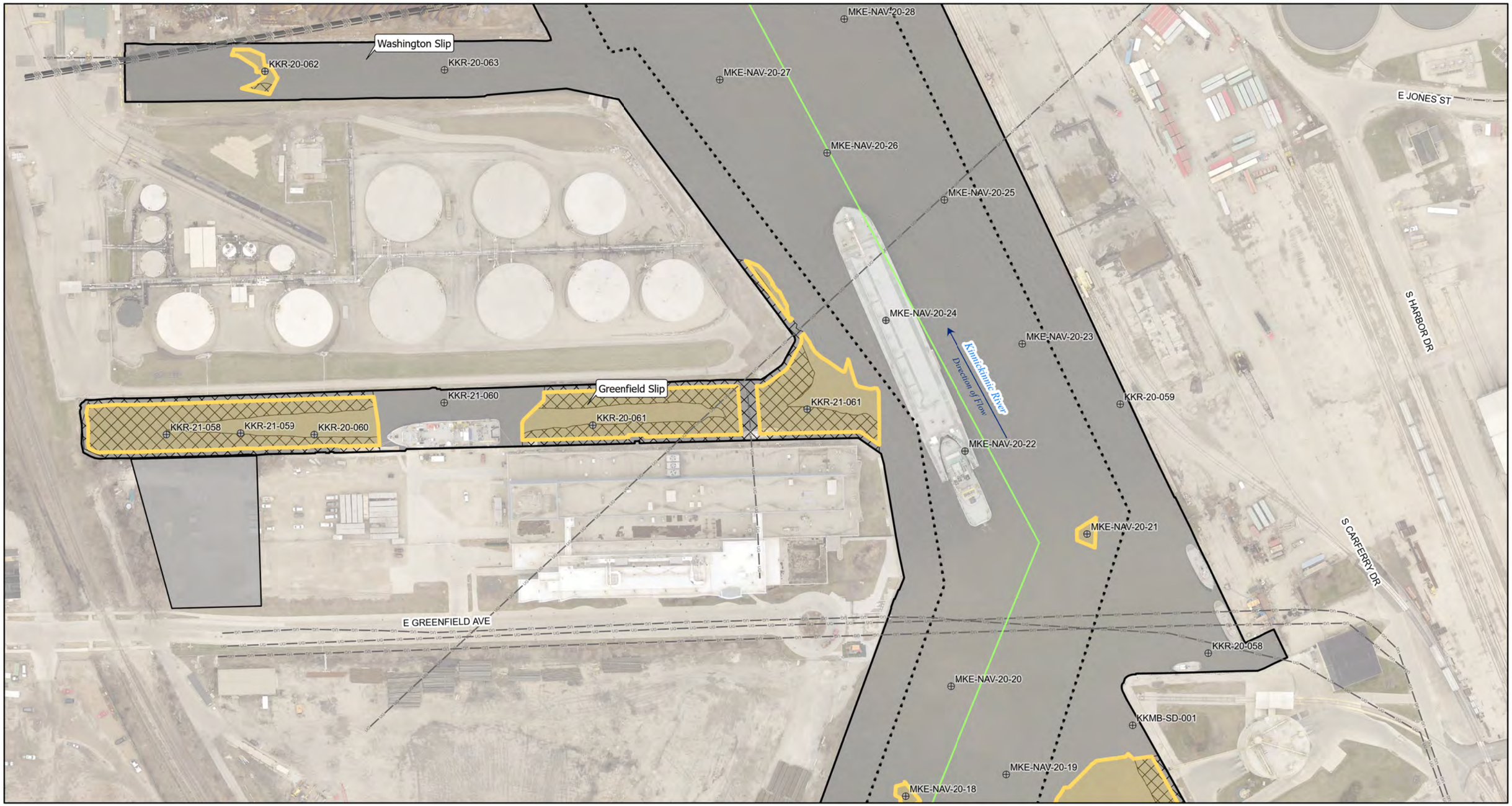


Figure 5-4F
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

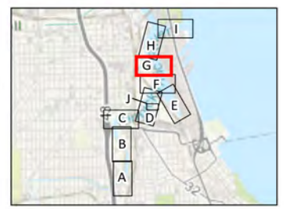
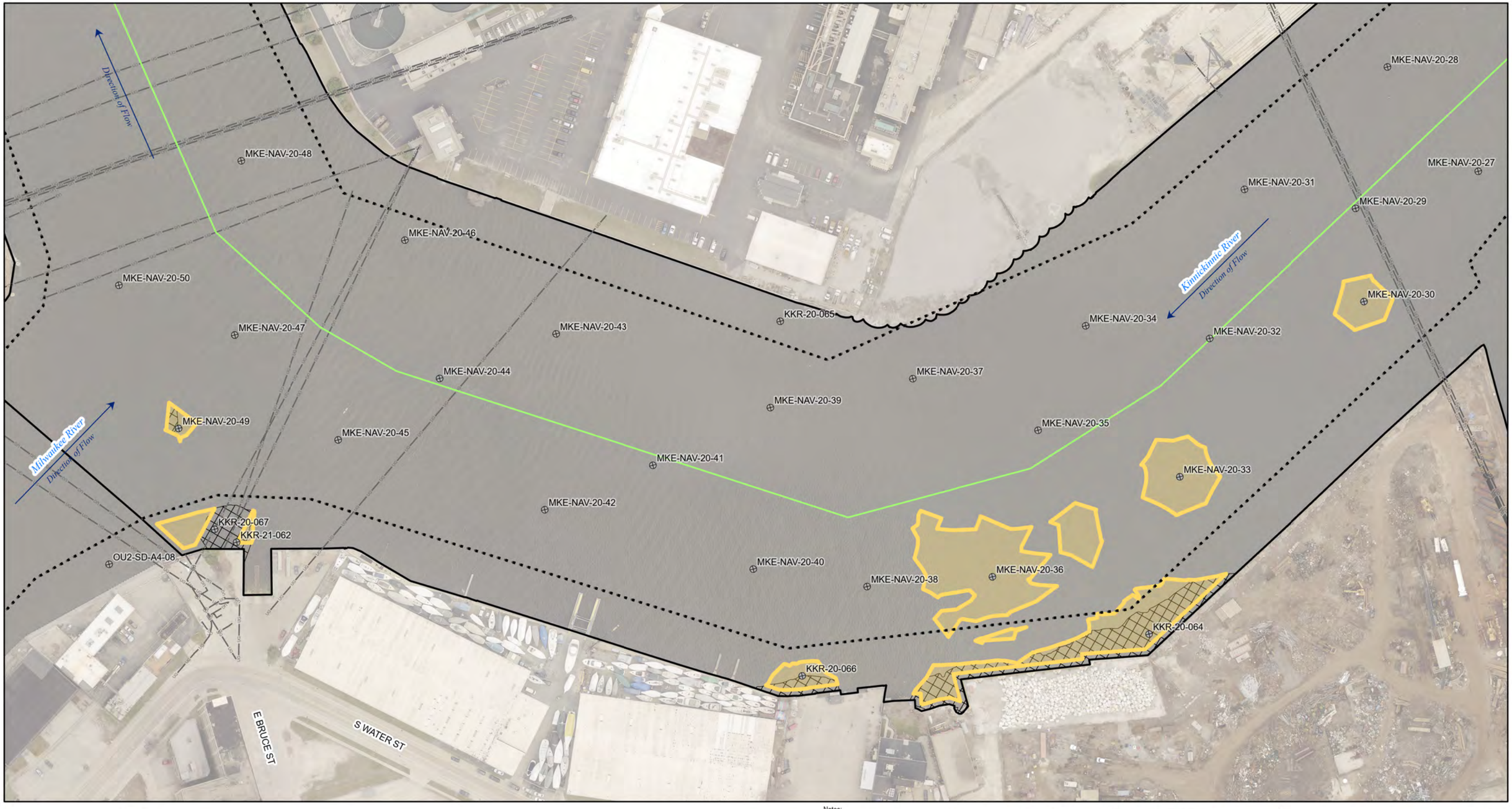


Figure 5-4G
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent

Kinnickinnic River Reach Areas

- Reach 4

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

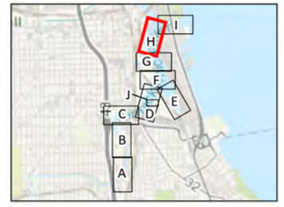
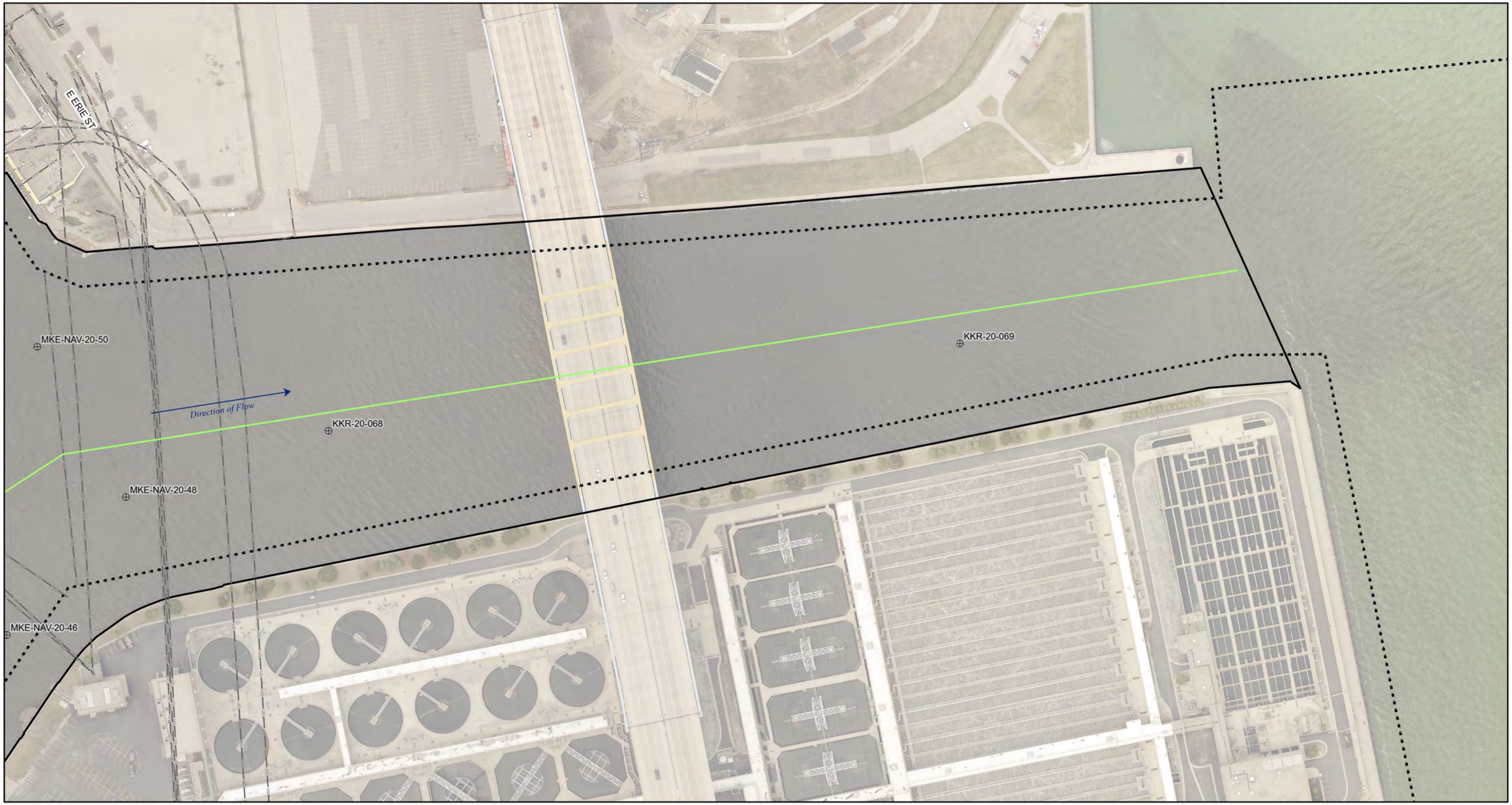


Figure 5-4H
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- Kinnickinnic River Project Area

Kinnickinnic River Reach Areas

- Reach 4

N

0 75 150

Approximate scale in feet

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. TSCA = Toxic Substances Control Act (50 milligrams per kilogram)

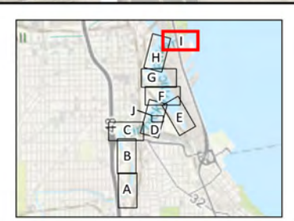


Figure 5-4I
Kinnickinnic River Site Features - Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-22-002

	Depth	PCB	Cr	Pb	Hg	PAH
576.1	0 - 1	8.7	130	320	0.26	74.6
NE	1 - 2	28.9	340	610	0.42	223
	2 - 3	17.9	770	420	0.76	211
	3 - 3.8	0.65	540	240	1.2	148
	5 - 6	0.85	32	170	0.39	32

KK-SDA23

	Depth	Cr	Pb	Hg	PAH
574.4	0 - 0.3	130	270	0.27	92
	0.3 - 2	220	530	0.34	128
	4 - 6	21000	1500	1.5	174
	6 - 8	40000	1200	2.5	101
	8 - 10	28000	590	2.7	132
	12 - 14	30000	440	2.1	107
	14 - 16	11000	240	1.1	66.4
	16 - 18	27	9.1	0.014	0.49
	20 - 21	37	10	0.015	0.096

KKR-22-003

	Depth	PCB	Cr	Pb	Hg	PAH
576.8	0 - 1	42	250	660	0.4	161
NE	1 - 2	59	1200	3600	1.1	223
	2 - 3.1	1.05	11000	470	1.1	302
	5 - 6	1.05	10000	270	1.4	113
	6 - 7	1.1	3100	210	0.7	154
	7 - 8	1	370	160	0.54	154
	10 - 11	1.05	27	57	0.25	16.4
	11 - 12	0.95	6.4	3.2	0.012	0.31
	12 - 13	0.85	11	5	0.014	1.81
	13 - 14	0.85	11	5.1	0.015	0.26

KKR-21-057

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1	57	552	467	0.58	147
NE	1 - 3	171	736	593	0.88	199
	3 - 4.3	0.11	1790	653	1.7	173

KKR-21-056

	Depth	PCB	Cr	Pb	Hg	PAH
578.8	0 - 1	14	180	223	0.36	159
NE	1 - 2.9	88	694	494	0.63	284

KKR-22-006

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1.3	183	450	590	0.44	204
NE						

KKR-21-055

	Depth	PCB	Cr	Pb	Hg	PAH
577.7	0 - 0.8	17.9	166	166	0.14	435
NE						

KKR-20-031

	Depth	PCB	Cr	Pb	Hg	PAH
579.1	0 - 1	49	169	321	0.39	128
NE	1 - 3	280	840	716	1.3	150
	3 - 4.7	21	844	460	0.87	94.8

KKR-21-054

	Depth	PCB	Cr	Pb	Hg	PAH
579.8	0.6 - 0.9	7.8	84.6	201	0.13	24.5
NE						

KKR-21-55A

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0.5 - 1.2	19.8	132	247	0.27	67.8
NE						

KKR-20-032

	Depth	PCB	Cr	Pb	Hg	PAH
577.9	0 - 1	22.9	180	425	0.37	161
NE	1 - 3	86	569	535	0.76	180
	3 - 5	7.6	1370	984	1.3	267
	5 - 6.6	0.0041	3610	196	0.5	89.6

KKR-22-007

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	3.14	70	140	0.2	57.1
NE	1 - 2	18.8	440	530	0.37	181
	5 - 6	36.2	280	470	0.45	187
	6 - 7	32.4	250	410	0.59	169
	7 - 8.2	1.81	470	390	1.4	311
	10 - 11	0.7	1400	1100	1.1	226
	11 - 12	0.7	570	370	1.8	264
	12 - 13	0.7	860	340	1.6	273
	13 - 14.2	0.7	1800	380	1.5	295

KKR-22-004

	Depth	PCB	Cr	Pb	Hg	PAH
573.3	0 - 1	8.3	97	210	0.2	70
16.1	1 - 2	13.4	150	360	0.25	117
	2 - 3	14.5	960	1000	0.42	267
	3 - 3.9	59.9	180	620	0.51	186
	5 - 6	0.35	10000	570	1.5	96.7
	6 - 7	0.9	11000	250	1.4	126
	7 - 8	0.85	7500	240	1.3	149
	8 - 8.8	0.9	2300	200	1.4	226
	10 - 11	1.05	13000	550	3.3	201

KKR-22-008

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	19.9	150	250	0.25	71.9
NE	1 - 2	14.3	670	640	0.38	127
	2 - 2.7	124	330	610	0.57	176
	5 - 6	34.3	300	400	0.8	185
	6 - 7	26	730	500	1.3	194
	7 - 7.8	0.85	1300	620	0.46	283
	10 - 11	1.2	8600	800	1.2	258
	11 - 12	1.5	46000	3000	2.2	287
	12 - 13.2	1.65	57000	7400	3.8	281

KKR-22-005

	Depth	PCB	Cr	Pb	Hg	PAH
575.4	0 - 1	25.8	200	330	0.3	87.1
NE	1 - 2	135	500	650	0.7	274
	2 - 2.5	221	470	540	0.65	229
	5 - 6	63.4	380	440	0.84	204
	6 - 7	6.96	5200	810	1.3	204
	7 - 8	1.4	16000	2200	2.4	252
	10 - 11	0.467	19000	1600	2	164
	11 - 12	1.85	13000	1400	2.8	171
	12 - 13	1.3	24000	510	2.8	134

Kinnickinnic River

Direction of Flow

KK-SDA14

KK-SDA22

KKR-22-001

KKR-20-033

DA DR

LEGEND

- Analytical Sample Location
- Underground Utility
- Federal Navigation Channel (Source: U.S. Army Corps of Engineers)
- TSCA Removal Shoreline Reinforcement
- Proposed Staging Area and Access Roads (for cost estimate purposes only)
- Kinnickinnic River Project Area
- Non-TSCA Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent

N

0 25 50

Approximate scale in feet

Analytical Results for Locations with PCB >50 mg/kg

Location ID				
Mudline Elevation		PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	Depth	<1	<PEC	<PEC
	Sample interval (ft bss)	1 - 3	>PEC	>PEC
		3 - 5	>3xPEC	>3xPEC
		5 - 50	>5xPEC	>5xPEC
		>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

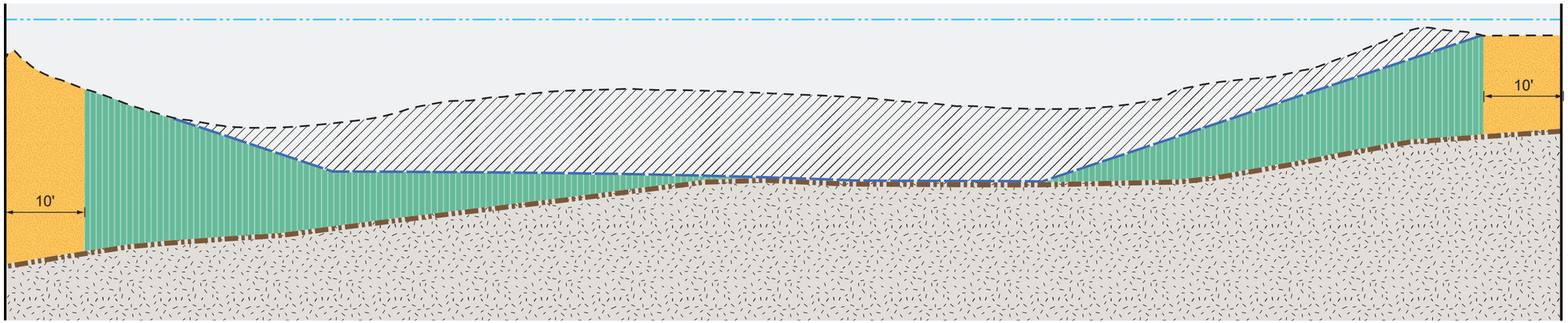
NE = Native Material Not Encountered

Notes:

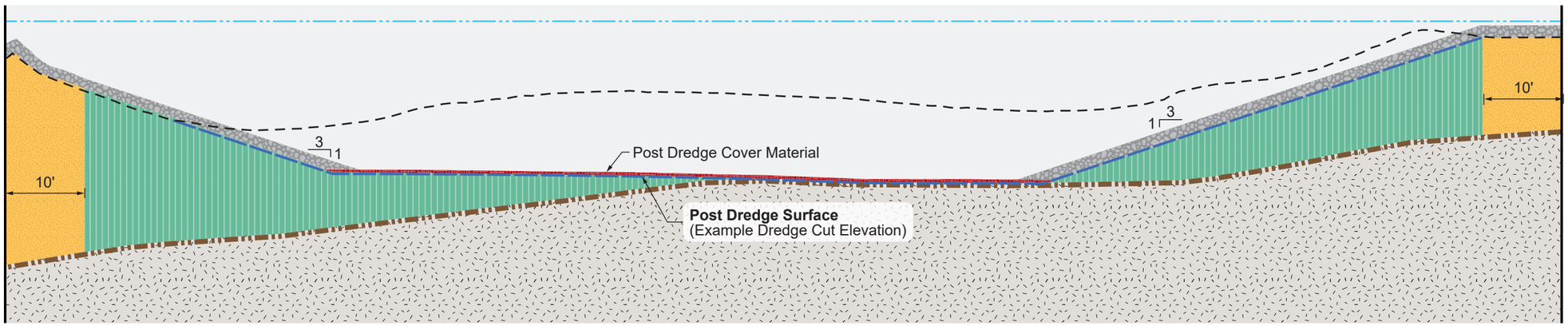
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
3. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered, PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC= Probable effects concentration; TSCA = Toxic Substances Control Act (50 mg/kg)

Figure 5-4J
Grand Trunk Slip Detail
Alternative 4 Conceptual Layout
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



Conceptual Sediment Removal Profile



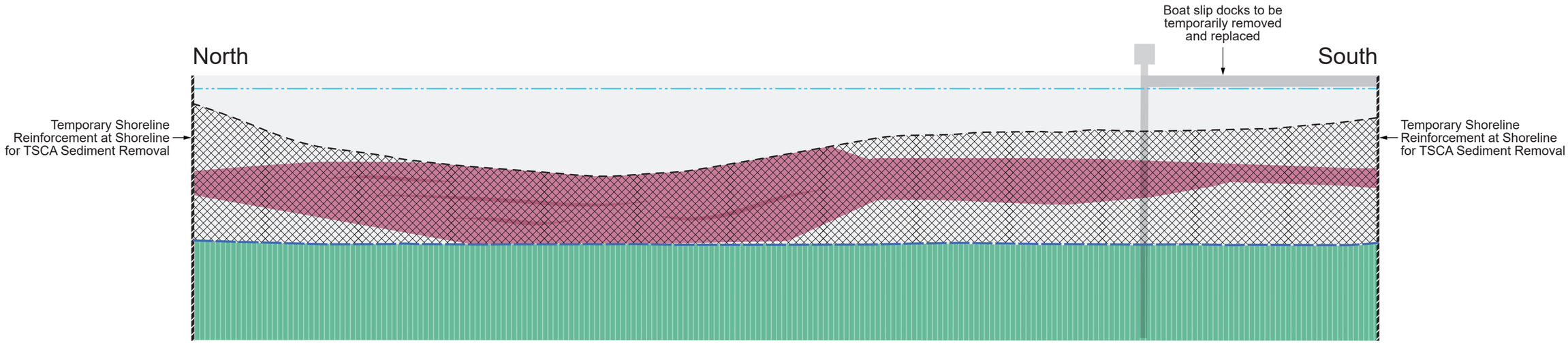
Post Dredge Conceptual Sediment Cap and Cover Placement

Legend

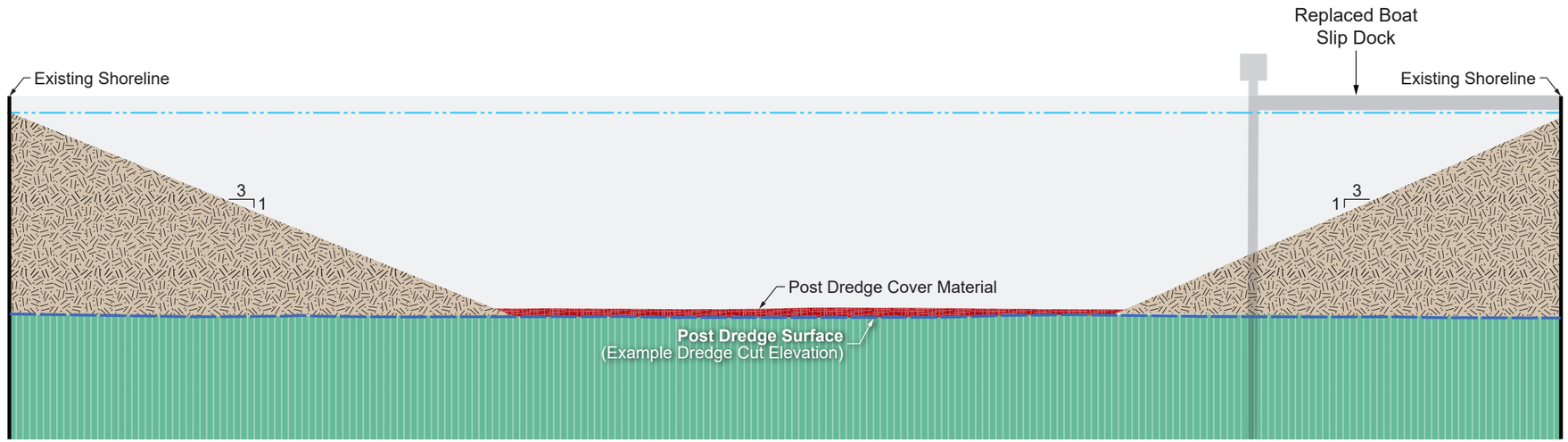
- Proposed Dredging
- Shoreline and Utility Offset/No Dredge Zone
- Non-Dredged Sediment
- Post Dredge Cover Material
- Cap
- Native Material
- Conceptual Top of Native Material
- Approximate Water Elevation
- Top of Sediment
- Example Dredge Cut Elevation

Notes:
Not to Scale

Figure 5-5
Kinnickinnic River Project Area
Conceptual Sediment Removal and Cap Profiles
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



Conceptual Sediment Removal Profile



Post Dredge Conceptual Sediment Cap and Cover Placement

Legend

- Dredged Sediment
- TSCA Sediment[1]
- Non-Dredged Sediment
- Post Dredge Cover Material
- Clean Fill
- Approximate Water Elevation
- Top of Sediment
- Example Dredge Cut Elevation

Notes:

Not to Scale.

PCB - Polychlorinated Biphenyl

TSCA - Toxic Substances Control Act

[1]Conceptual location of sediment with PCB concentrations exceeding the TSCA threshold of 50 milligrams per kilogram

Figure 5-6
Kinnickinnic River Project Area
Grand Trunk Slip - Conceptual Sediment Removal and Cap Profiles
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

KKR-20-004

	Depth	PCB	Cr	Pb	Hg	PAH
576.9	0 - 1	0.12	18	64	0.021	63.1
NE	1 - 3	0.38	13	36	0.0095	21
	3 - 5	3	65	310	0.24	238
	5 - 6.7	2.8	130	370	0.45	429

KKR-20-003

	Depth	PCB	Cr	Pb	Hg	PAH
577.5	0 - 1	0.057	12	31	0.012	121
NE	1 - 3	0.43	12	51	0.03	49.8
	3 - 5	0.0037	27	89	0.23	98.1
	5 - 6	0.0018	28	110	0.03	41.5

KK-SDU14

	Depth	Cr	Pb	Hg	PAH
576.8	0 - 0.3	24	29	0.029	47.7
	0.3 - 2	21	70	0.094	37.2
	2 - 4.5	32	130	0.067	72.6

KKR-20-002

	Depth	PCB	Cr	Pb	Hg	PAH
578.0	0 - 1	0.098	12	30	0.017	15.5
NE	1 - 3	0.062	20	37	0.054	20.8
	3 - 5	1.6	130	340	0.047	332
	5 - 6	0.1	580	530	0.54	376

KKR-20-001

	Depth	PCB	Cr	Pb	Hg	PAH
572.9	0 - 1	0.0065	14	8	0.017	2.3
NE	1 - 2.9	0.0017	11	10	0.015	0.013

KKM-21-001

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	0.0021	50.1	63.2	0.13	73.1

S 1ST ST

S CHASE AVE

Kinnickinnic River

Direction of Flow

UG

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG — Underground Utility

Kinnickinnic River Reach Areas

- Reach 1

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575

N

0 40 80

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

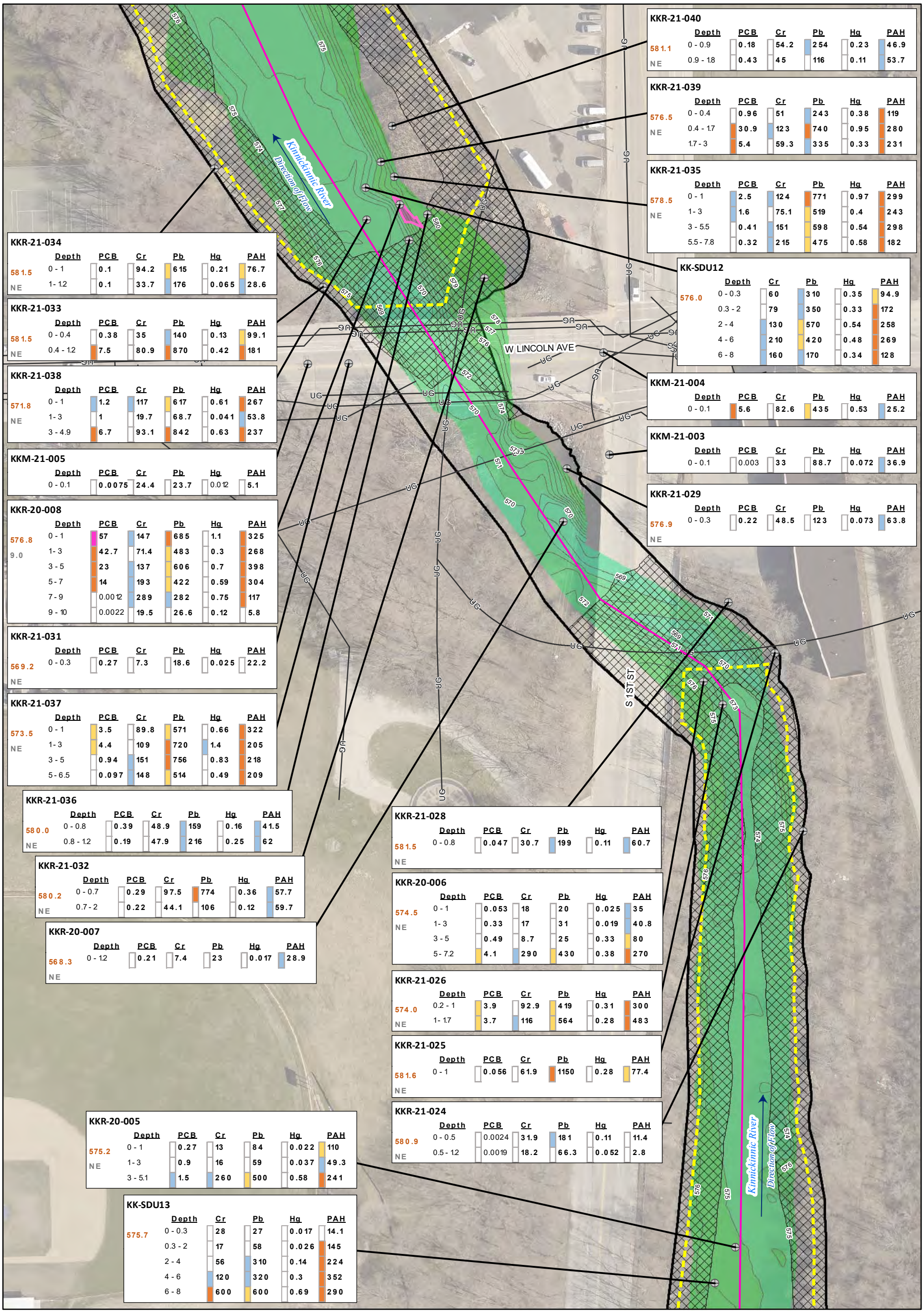
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1A
Recommended Remedial Alternative
Kinnickinnic River - Reach 1
Map 1 of 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



KKR-21-040

	Depth	PCB	Cr	Pb	Hg	PAH
581.1	0 - 0.9	0.18	54.2	254	0.23	46.9
NE	0.9 - 1.8	0.43	45	116	0.11	53.7

KKR-21-039

	Depth	PCB	Cr	Pb	Hg	PAH
576.5	0 - 0.4	0.96	51	243	0.38	119
NE	0.4 - 1.7	30.9	123	740	0.95	280
	1.7 - 3	5.4	59.3	335	0.33	231

KKR-21-035

	Depth	PCB	Cr	Pb	Hg	PAH
578.5	0 - 1	2.5	124	771	0.97	299
NE	1 - 3	1.6	75.1	519	0.4	243
	3 - 5.5	0.41	151	598	0.54	298
	5.5 - 7.8	0.32	215	475	0.58	182

KK-SDU12

	Depth	Cr	Pb	Hg	PAH
576.0	0 - 0.3	60	310	0.35	94.9
	0.3 - 2	79	350	0.33	172
	2 - 4	130	570	0.54	258
	4 - 6	210	420	0.48	269
	6 - 8	160	170	0.34	128

KKM-21-004

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	5.6	82.6	435	0.53	25.2

KKM-21-003

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	0.003	33	88.7	0.072	36.9

KKR-21-029

	Depth	PCB	Cr	Pb	Hg	PAH
576.9	0 - 0.3	0.22	48.5	123	0.073	63.8
NE						

KKR-21-034

	Depth	PCB	Cr	Pb	Hg	PAH
581.5	0 - 1	0.1	94.2	615	0.21	76.7
NE	1 - 1.2	0.1	33.7	176	0.065	28.6

KKR-21-033

	Depth	PCB	Cr	Pb	Hg	PAH
581.5	0 - 0.4	0.38	35	140	0.13	99.1
NE	0.4 - 1.2	7.5	80.9	870	0.42	181

KKR-21-038

	Depth	PCB	Cr	Pb	Hg	PAH
571.8	0 - 1	1.2	117	617	0.61	267
NE	1 - 3	1	19.7	68.7	0.041	53.8
	3 - 4.9	6.7	93.1	842	0.63	237

KKM-21-005

Depth	PCB	Cr	Pb	Hg	PAH
0 - 0.1	0.0075	24.4	23.7	0.012	5.1

KKR-20-008

	Depth	PCB	Cr	Pb	Hg	PAH
576.8	0 - 1	57	147	685	1.1	325
9.0	1 - 3	42.7	71.4	483	0.3	268
	3 - 5	23	137	606	0.7	398
	5 - 7	14	193	422	0.59	304
	7 - 9	0.0012	289	282	0.75	117
	9 - 10	0.0022	19.5	26.6	0.12	5.8

KKR-21-031

	Depth	PCB	Cr	Pb	Hg	PAH
569.2	0 - 0.3	0.27	7.3	18.6	0.025	22.2
NE						

KKR-21-037

	Depth	PCB	Cr	Pb	Hg	PAH
573.5	0 - 1	3.5	89.8	571	0.66	322
NE	1 - 3	4.4	109	720	1.4	205
	3 - 5	0.94	151	756	0.83	218
	5 - 6.5	0.097	148	514	0.49	209

KKR-21-036

	Depth	PCB	Cr	Pb	Hg	PAH
580.0	0 - 0.8	0.39	48.9	159	0.16	41.5
NE	0.8 - 1.2	0.19	47.9	216	0.25	62

KKR-21-032

	Depth	PCB	Cr	Pb	Hg	PAH
580.2	0 - 0.7	0.29	97.5	774	0.36	57.7
NE	0.7 - 2	0.22	44.1	106	0.12	59.7

KKR-20-007

	Depth	PCB	Cr	Pb	Hg	PAH
568.3	0 - 1.2	0.21	7.4	23	0.017	28.9
NE						

KKR-21-028

	Depth	PCB	Cr	Pb	Hg	PAH
581.5	0 - 0.8	0.047	30.7	199	0.11	60.7
NE						

KKR-20-006

	Depth	PCB	Cr	Pb	Hg	PAH
574.5	0 - 1	0.053	18	20	0.025	35
NE	1 - 3	0.33	17	31	0.019	40.8
	3 - 5	0.49	8.7	25	0.33	80
	5 - 7.2	4.1	290	430	0.38	270

KKR-21-026

	Depth	PCB	Cr	Pb	Hg	PAH
574.0	0.2 - 1	3.9	92.9	419	0.31	300
NE	1 - 1.7	3.7	116	564	0.28	483

KKR-21-025

	Depth	PCB	Cr	Pb	Hg	PAH
581.6	0 - 1	0.056	61.9	1150	0.28	77.4
NE						

KKR-21-024

	Depth	PCB	Cr	Pb	Hg	PAH
580.9	0 - 0.5	0.0024	31.9	181	0.11	11.4
NE	0.5 - 1.2	0.0019	18.2	66.3	0.052	2.8

KKR-20-005

	Depth	PCB	Cr	Pb	Hg	PAH
575.2	0 - 1	0.27	13	84	0.022	110
NE	1 - 3	0.9	16	59	0.037	49.3
	3 - 5.1	1.5	260	500	0.58	241

KK-SDU13

	Depth	Cr	Pb	Hg	PAH
575.7	0 - 0.3	28	27	0.017	14.1
	0.3 - 2	17	58	0.026	145
	2 - 4	56	310	0.14	224
	4 - 6	120	320	0.3	352
	6 - 8	600	600	0.69	290

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- TSCA Sediment Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG — Underground Utility

Kinnickinnic River Reach Areas
- Reach 1

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570

N

0 40 80

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>5xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1B
Recommended Remedial Alternative
Kinnickinnic River - Reach 1
Map 2 of 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

KKR-20-013

	Depth	PCB	Cr	Pb	Hg	PAH
571.1	0 - 1	2.6	55	440	1.7	167
4.6	1 - 3	5.9	76	550	0.41	314
	3 - 4.6	0.33	44	290	0.27	185
	4.6 - 7	0.0016	13	7.5	0.02	0.63

KK-SDU11

	Depth	Cr	Pb	Hg	PAH
576.9	0 - 0.3	40	84	0.035	40.6
	0.3 - 2	46	290	0.21	174
	2 - 4	80	350	0.46	217
	4 - 6	140	450	0.51	229
	6 - 7	230	520	1.1	219

KKR-21-050

	Depth	PCB	Cr	Pb	Hg	PAH
580.2	0 - 1	0.36	46.1	138	0.15	72.7
NE	1 - 3	1.1	125	829	0.46	147
	3 - 5	7.3	103	651	0.66	168
	5 - 6.8	4	62.8	382	0.35	133

KKR-20-012

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	3.7	24	190	0.07	63.1
NE	1 - 3	9.1	47	280	0.27	185
	3 - 5	7.1	93	500	0.49	321
	5 - 7	2.6	140	380	0.55	247
	7 - 8.8	0.57	150	260	1	255

KKR-21-049

	Depth	PCB	Cr	Pb	Hg	PAH
571.7	0 - 0.8	0.46	20	74.5	0.047	194
NE	0.8 - 3	0.3	143	435	0.64	202
	3 - 4.4	0.19	191	362	0.61	142

KKR-20-011

	Depth	PCB	Cr	Pb	Hg	PAH
571.5	0 - 1	0.54	15	510	0.04	46.6
NE	1 - 3	5.3	18	89	1.7	70.4
	3 - 5	10.6	52	330	0.29	194
	5 - 7	4.1	67	390	0.31	51.6
	7 - 9	0.0012	650	280	1.2	220
	9 - 9.9	0.0012	140	130	0.88	25.7

KKR-20-010

	Depth	PCB	Cr	Pb	Hg	PAH
571.8	0 - 1	0.28	22	61	0.031	511
NE	1 - 3	5.5	33	170	0.15	127
	3 - 5	3.8	60	330	0.24	350
	5 - 7	3.4	140	390	0.46	240
	7 - 8	0.0012	570	340	1.7	53.1

KKR-21-048

	Depth	PCB	Cr	Pb	Hg	PAH
571.5	0 - 1	0.5	25.8	36.1	0.021	118
NE	1 - 1.8	0.65	12.8	25.7	0.02	45.1

KKR-21-046

	Depth	PCB	Cr	Pb	Hg	PAH
573.0	0 - 1.3	3.6	17.4	88.4	0.45	68.5
NE	1.3 - 1.8	5.3	51.2	270	0.49	242
	1.8 - 4	2.1	67	407	0.33	191

KKR-21-045

	Depth	PCB	Cr	Pb	Hg	PAH
587.7	0 - 1.3	0.12	17.5	134	0.39	22.3
NE						

KKR-21-044

	Depth	PCB	Cr	Pb	Hg	PAH
591.9	0.2 - 0.9	0.0018	16.4	122	0.075	5.1
NE	0.9 - 1.1	0.018	48.3	347	4.4	59.1

KKR-21-043

	Depth	PCB	Cr	Pb	Hg	PAH
573.7	0 - 1	0.45	17.9	38.1	0.036	121
NE	1 - 3	0.66	39.8	222	0.21	197
	3 - 5	1	136	509	0.52	317
	5 - 5.9	0.21	157	459	0.58	203

KKR-20-009

	Depth	PCB	Cr	Pb	Hg	PAH
573.9	0 - 1.3	0.24	21.7	48	0.03	65.3
3.6	1.3 - 3	2.1	42.1	193	0.18	192
	3 - 5	9.3	84.3	374	0.53	402
	5 - 7	3.3	190	415	0.49	197
	7 - 9	0.82	308	248	1.3	83.5
	9 - 9.9	0.0022	102	94.9	0.85	13.9

KKR-21-042

	Depth	PCB	Cr	Pb	Hg	PAH
581.2	0 - 0.9	0.013	17.4	258	0.031	4.6
NE						

KKR-21-041

	Depth	PCB	Cr	Pb	Hg	PAH
573.6	0 - 1.3	0.29	15.8	82.7	0.045	36.4
NE	1.3 - 2.3	1.3	32.8	258	0.18	112

Kinnickinnic River

Direction of Flow

W BECHER ST

2ND

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG — Underground Utility

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565

N

0 40 80

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

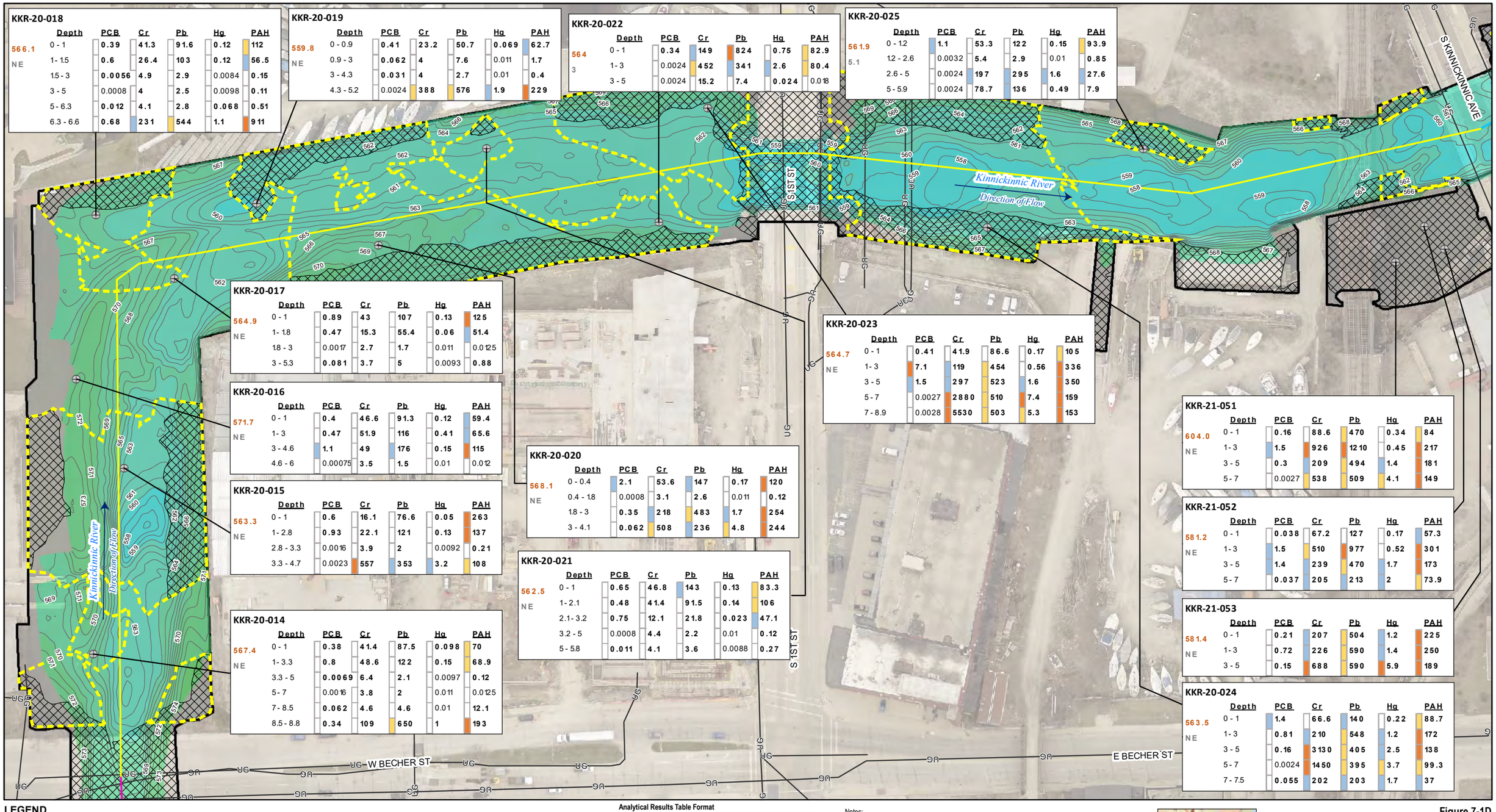
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office.
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAHs = polycyclic aromatic hydrocarbons; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1C
Recommended Remedial Alternative
Kinnickinnic River - Reach 1
Map 3 of 3
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



KKR-20-018

	Depth	PCB	Cr	Pb	Hg	PAH
566.1	0 - 1	0.39	41.3	91.6	0.12	112
NE	1 - 1.5	0.6	26.4	103	0.12	56.5
	1.5 - 3	0.0056	4.9	2.9	0.0084	0.15
	3 - 5	0.0008	4	2.5	0.0098	0.11
	5 - 6.3	0.012	4.1	2.8	0.068	0.51
	6.3 - 6.6	0.68	231	544	1.1	911

KKR-20-019

	Depth	PCB	Cr	Pb	Hg	PAH
559.8	0 - 0.9	0.41	23.2	50.7	0.069	62.7
NE	0.9 - 3	0.062	4	7.6	0.011	1.7
	3 - 4.3	0.031	4	2.7	0.01	0.4
	4.3 - 5.2	0.0024	388	576	1.9	229

KKR-20-022

	Depth	PCB	Cr	Pb	Hg	PAH
564	0 - 1	0.34	149	824	0.75	82.9
3	1 - 3	0.0024	452	341	2.6	80.4
	3 - 5	0.0024	15.2	7.4	0.024	0.018

KKR-20-025

	Depth	PCB	Cr	Pb	Hg	PAH
561.9	0 - 1.2	1.1	53.3	122	0.15	93.9
5.1	1.2 - 2.6	0.0032	5.4	2.9	0.01	0.85
	2.6 - 5	0.0024	197	295	1.6	27.6
	5 - 5.9	0.0024	78.7	136	0.49	7.9

KKR-20-017

	Depth	PCB	Cr	Pb	Hg	PAH
564.9	0 - 1	0.89	43	107	0.13	125
NE	1 - 1.8	0.47	15.3	55.4	0.06	51.4
	1.8 - 3	0.0017	2.7	1.7	0.011	0.0125
	3 - 5.3	0.081	3.7	5	0.0093	0.88

KKR-20-023

	Depth	PCB	Cr	Pb	Hg	PAH
564.7	0 - 1	0.41	41.9	86.6	0.17	105
NE	1 - 3	7.1	119	454	0.56	336
	3 - 5	1.5	297	523	1.6	350
	5 - 7	0.0027	2880	510	7.4	159
	7 - 8.9	0.0028	5530	503	5.3	153

KKR-21-051

	Depth	PCB	Cr	Pb	Hg	PAH
604.0	0 - 1	0.16	88.6	470	0.34	84
NE	1 - 3	1.5	926	1210	0.45	217
	3 - 5	0.3	209	494	1.4	181
	5 - 7	0.0027	538	509	4.1	149

KKR-20-016

	Depth	PCB	Cr	Pb	Hg	PAH
571.7	0 - 1	0.4	46.6	91.3	0.12	59.4
NE	1 - 3	0.47	51.9	116	0.41	65.6
	3 - 4.6	1.1	49	176	0.15	115
	4.6 - 6	0.00075	3.5	1.5	0.01	0.012

KKR-20-020

	Depth	PCB	Cr	Pb	Hg	PAH
568.1	0 - 0.4	2.1	53.6	147	0.17	120
NE	0.4 - 1.8	0.0008	3.1	2.6	0.011	0.12
	1.8 - 3	0.35	218	483	1.7	254
	3 - 4.1	0.062	508	236	4.8	244

KKR-21-052

	Depth	PCB	Cr	Pb	Hg	PAH
581.2	0 - 1	0.038	67.2	127	0.17	57.3
NE	1 - 3	1.5	510	977	0.52	301
	3 - 5	1.4	239	470	1.7	173
	5 - 7	0.037	205	213	2	73.9

KKR-20-015

	Depth	PCB	Cr	Pb	Hg	PAH
563.3	0 - 1	0.6	16.1	76.6	0.05	263
NE	1 - 2.8	0.93	22.1	121	0.13	137
	2.8 - 3.3	0.0016	3.9	2	0.0092	0.21
	3.3 - 4.7	0.0023	557	353	3.2	108

KKR-20-021

	Depth	PCB	Cr	Pb	Hg	PAH
562.5	0 - 1	0.65	46.8	143	0.13	83.3
NE	1 - 2.1	0.48	41.4	91.5	0.14	106
	2.1 - 3.2	0.75	12.1	21.8	0.023	47.1
	3.2 - 5	0.0008	4.4	2.2	0.01	0.12
	5 - 5.8	0.011	4.1	3.6	0.0088	0.27

KKR-21-053

	Depth	PCB	Cr	Pb	Hg	PAH
581.4	0 - 1	0.21	207	504	1.2	225
NE	1 - 3	0.72	226	590	1.4	250
	3 - 5	0.15	688	590	5.9	189

KKR-20-014

	Depth	PCB	Cr	Pb	Hg	PAH
567.4	0 - 1	0.38	41.4	87.5	0.098	70
NE	1 - 3.3	0.8	48.6	122	0.15	68.9
	3.3 - 5	0.0069	6.4	2.1	0.0097	0.12
	5 - 7	0.0016	3.8	2	0.011	0.0125
	7 - 8.5	0.062	4.6	4.6	0.01	12.1
	8.5 - 8.8	0.34	109	650	1	193

KKR-21-024

	Depth	PCB	Cr	Pb	Hg	PAH
563.5	0 - 1	1.4	66.6	140	0.22	88.7
NE	1 - 3	0.81	210	548	1.2	172
	3 - 5	0.16	3130	405	2.5	138
	5 - 7	0.0024	1450	395	3.7	99.3
	7 - 7.5	0.055	202	203	1.7	37

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG — Underground Utility

Kinnickinnic River Reach Areas

- Reach 1
- Reach 2
- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560

N

0 50 100

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1D
Recommended Remedial Alternative
Kinnickinnic River - Reach 2
Map 1 of 1
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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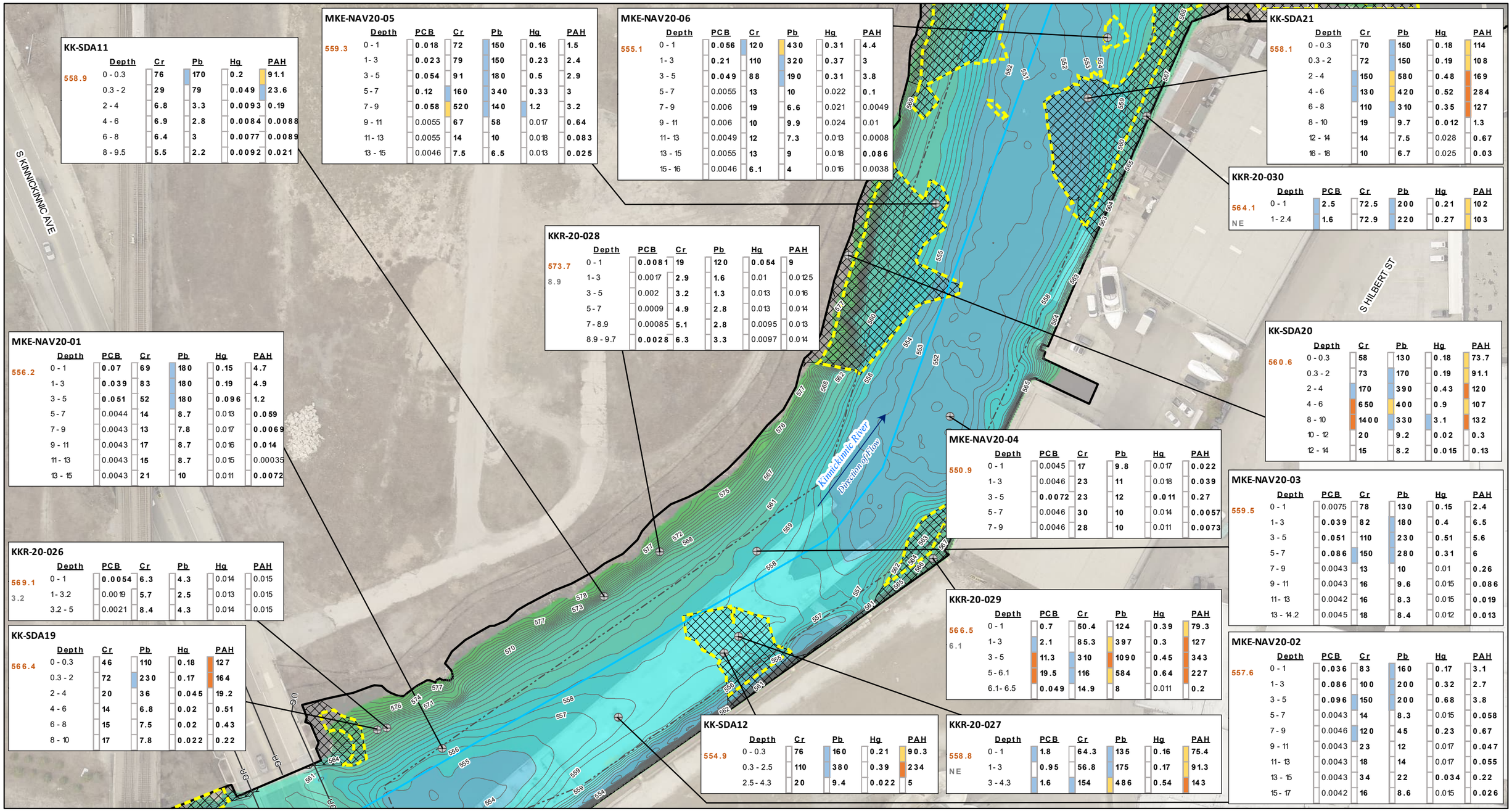

KK-SDA11

	Depth	Cr	Pb	Hg	PAH
558.9	0 - 0.3	76	170	0.2	91.1
	0.3 - 2	29	79	0.049	23.6
	2 - 4	6.8	3.3	0.0093	0.19
	4 - 6	6.9	2.8	0.0084	0.0088
	6 - 8	6.4	3	0.0077	0.0089
	8 - 9.5	5.5	2.2	0.0092	0.021

MKE-NAV20-05

	Depth	PCB	Cr	Pb	Hg	PAH
559.3	0 - 1	0.018	72	150	0.16	1.5
	1 - 3	0.023	79	150	0.23	2.4
	3 - 5	0.054	91	180	0.5	2.9
	5 - 7	0.12	160	340	0.33	3
	7 - 9	0.058	520	140	1.2	3.2
	9 - 11	0.0055	67	58	0.017	0.64
	11 - 13	0.0055	14	10	0.018	0.083
	13 - 15	0.0046	7.5	6.5	0.013	0.025

MKE-NAV20-06

	Depth	PCB	Cr	Pb	Hg	PAH
555.1	0 - 1	0.056	120	430	0.31	4.4
	1 - 3	0.21	110	320	0.37	3
	3 - 5	0.049	88	190	0.31	3.8
	5 - 7	0.0055	13	10	0.022	0.1
	7 - 9	0.006	19	6.6	0.021	0.0049
	9 - 11	0.006	10	9.9	0.024	0.01
	11 - 13	0.0049	12	7.3	0.013	0.0008
	13 - 15	0.0055	13	9	0.018	0.086
	15 - 16	0.0046	6.1	4	0.016	0.0038

KK-SDA21

	Depth	Cr	Pb	Hg	PAH
558.1	0 - 0.3	70	150	0.18	114
	0.3 - 2	72	150	0.19	108
	2 - 4	150	580	0.48	169
	4 - 6	130	420	0.52	284
	6 - 8	110	310	0.35	127
	8 - 10	19	9.7	0.012	1.3
	12 - 14	14	7.5	0.028	0.67
	16 - 18	10	6.7	0.025	0.03

KKR-20-030

	Depth	PCB	Cr	Pb	Hg	PAH
564.1	0 - 1	2.5	72.5	200	0.21	102
NE	1 - 2.4	1.6	72.9	220	0.27	103

KKR-20-028

	Depth	PCB	Cr	Pb	Hg	PAH
573.7	0 - 1	0.0081	19	120	0.054	9
8.9	1 - 3	0.0017	2.9	1.6	0.01	0.0125
	3 - 5	0.002	3.2	1.3	0.013	0.016
	5 - 7	0.0009	4.9	2.8	0.013	0.014
	7 - 8.9	0.00085	5.1	2.8	0.0095	0.013
	8.9 - 9.7	0.0028	6.3	3.3	0.0097	0.014

KK-SDA20

	Depth	Cr	Pb	Hg	PAH
560.6	0 - 0.3	58	130	0.18	73.7
	0.3 - 2	73	170	0.19	91.1
	2 - 4	170	390	0.43	120
	4 - 6	650	400	0.9	107
	8 - 10	1400	330	3.1	132
	10 - 12	20	9.2	0.02	0.3
	12 - 14	15	8.2	0.015	0.13

MKE-NAV20-01

	Depth	PCB	Cr	Pb	Hg	PAH
556.2	0 - 1	0.07	69	180	0.15	4.7
	1 - 3	0.039	83	180	0.19	4.9
	3 - 5	0.051	52	180	0.096	1.2
	5 - 7	0.0044	14	8.7	0.013	0.059
	7 - 9	0.0043	13	7.8	0.017	0.0069
	9 - 11	0.0043	17	8.7	0.016	0.014
	11 - 13	0.0043	15	8.7	0.015	0.00035
	13 - 15	0.0043	21	10	0.011	0.0072

MKE-NAV20-04

	Depth	PCB	Cr	Pb	Hg	PAH
550.9	0 - 1	0.0045	17	9.8	0.017	0.022
	1 - 3	0.0046	23	11	0.018	0.039
	3 - 5	0.0072	23	12	0.011	0.27
	5 - 7	0.0046	30	10	0.014	0.0057
	7 - 9	0.0046	28	10	0.011	0.0073

MKE-NAV20-03

	Depth	PCB	Cr	Pb	Hg	PAH
559.5	0 - 1	0.0075	78	130	0.15	2.4
	1 - 3	0.039	82	180	0.4	6.5
	3 - 5	0.051	110	230	0.51	5.6
	5 - 7	0.086	150	280	0.31	6
	7 - 9	0.0043	13	10	0.01	0.26
	9 - 11	0.0043	16	9.6	0.015	0.086
	11 - 13	0.0042	16	8.3	0.015	0.019
	13 - 14.2	0.0045	18	8.4	0.012	0.013

KKR-20-026

	Depth	PCB	Cr	Pb	Hg	PAH
569.1	0 - 1	0.0054	6.3	4.3	0.014	0.015
3.2	1 - 3.2	0.0019	5.7	2.5	0.013	0.015
	3.2 - 5	0.0021	8.4	4.3	0.014	0.015

KKR-20-029

	Depth	PCB	Cr	Pb	Hg	PAH
566.5	0 - 1	0.7	50.4	124	0.39	79.3
6.1	1 - 3	2.1	85.3	397	0.3	127
	3 - 5	11.3	310	1090	0.45	343
	5 - 6.1	19.5	116	584	0.64	227
	6.1 - 6.5	0.049	14.9	8	0.011	0.2

KK-SDA19

	Depth	Cr	Pb	Hg	PAH
566.4	0 - 0.3	46	110	0.18	127
	0.3 - 2	72	230	0.17	164
	2 - 4	20	36	0.045	19.2
	4 - 6	14	6.8	0.02	0.51
	6 - 8	15	7.5	0.02	0.43
	8 - 10	17	7.8	0.022	0.22

KK-SDA12

	Depth	Cr	Pb	Hg	PAH
554.9	0 - 0.3	76	160	0.21	90.3
	0.3 - 2.5	110	380	0.39	234
	2.5 - 4.3	20	9.4	0.022	5

KKR-20-027

	Depth	PCB	Cr	Pb	Hg	PAH
558.8	0 - 1	1.8	64.3	135	0.16	75.4
NE	1 - 3	0.95	56.8	175	0.17	91.3
	3 - 4.3	1.6	154	486	0.54	143

MKE-NAV20-02

	Depth	PCB	Cr	Pb	Hg	PAH
557.6	0 - 1	0.036	83	160	0.17	3.1
	1 - 3	0.086	100	200	0.32	2.7
	3 - 5	0.096	150	200	0.68	3.8
	5 - 7	0.0043	14	8.3	0.015	0.058
	7 - 9	0.0046	120	45	0.23	0.67
	9 - 11	0.0043	23	12	0.017	0.047
	11 - 13	0.0043	18	14	0.017	0.055
	13 - 15	0.0043	34	22	0.034	0.22
	15 - 17	0.0042	16	8.6	0.015	0.026

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1E
Recommended Remedial Alternative
Kinnickinnic River - Reach 3
Map 1 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

MKE-NAV20-09

	Depth	PCB	Cr	Pb	Hg	PAH
556.5	0 - 1	0.038	82	150	0.22	4.4
	1 - 3	0.051	96	190	0.22	3.4
	3 - 5	0.22	260	480	0.58	3.3
	5 - 7	0.25	120	260	0.49	2.3
	7 - 9	0.2	96	230	0.26	3.1
	9 - 11	0.063	79	190	0.34	2
	11 - 13	0.0055	18	9	0.023	0.12
	13 - 15	0.006	15	8.2	0.02	0.049
	15 - 17	0.0055	16	7.1	0.018	0.016

KR04

	Depth	Cr	Pb	Hg	PAH
561.2	0 - 0.3	98	180	0.39	78.9
	6 - 8	1100	1000	0.48	357
	10 - 13	160	380	0.75	213

KK-SDA24

	Depth	Cr	Pb	Hg	PAH
564.4	8 - 10	150	370	0.46	181
	10 - 11.3	130	450	0.43	147

KKR-20-037

	Depth	PCB	Cr	Pb	Hg	PAH
564.3	0 - 1	1.4	68.2	166	0.22	91.7
NE	1 - 3	1.7	94.5	255	0.3	108
	3 - 5	5.6	760	809	0.41	286
	5 - 5.7	12.3	156	670	0.51	366

KK-SDA13

	Depth	Cr	Pb	Hg	PAH
563.6	0 - 0.3	52	370	0.16	87.8
	0.3 - 2	110	250	0.19	78.2
	2 - 4	260	440	0.64	118
	4 - 6	190	300	0.77	236
	6 - 8	62	100	0.18	73.8
	8 - 10	20	17	0.051	10.6

KK-SDA13A

	Depth	Cr	Pb	Hg	PAH
563.6	10 - 12	28	9.7	0.015	0.05
	14 - 16	16	7.2	0.012	0.024

MKE-NAV20-07

	Depth	PCB	Cr	Pb	Hg	PAH
553.8	0 - 1	0.078	260	720	0.44	3.8
	1 - 3	0.12	500	530	0.6	4.2
	3 - 5	0.09	170	290	0.39	2.5
	5 - 7	0.16	970	220	1.1	16.4
	7 - 9	0.0055	27	7.3	0.065	1
	9 - 11	0.0049	13	13	0.013	0.38
	11 - 13.3	0.0049	12	6.9	0.014	0.016

KKR-20-034

	Depth	PCB	Cr	Pb	Hg	PAH
562.4	0 - 1	6.6	119	447	0.42	174
9.2	1 - 3	0.27	255	260	1.3	167
	3 - 5	0.0023	471	251	1.7	174
	5 - 7	0.0024	1600	248	2.4	136
	7 - 9.2	0.0027	1640	257	3.7	98
	9.2 - 10	0.0022	16.1	7.2	0.017	2.4

KK-SDA14

	Depth	Cr	Pb	Hg	PAH
568.3	0 - 0.3	68	160	0.2	109
	0.3 - 2	70	190	0.21	104
	2 - 4	81	230	0.25	79.6
	4 - 6	170	460	0.44	155
	6 - 8	170	370	0.92	282
	8 - 10	170	290	1	268
	10 - 12	160	230	1.9	206
	12 - 14	240	210	1.3	180

KK-SDA25

	Depth	Cr	Pb	Hg	PAH
564.1	0 - 0.3	56	120	0.16	94.1
	0.3 - 2	110	220	0.26	91.4
	2 - 4	250	500	0.26	90.4
	4 - 6	29	43	0.032	11.6
	8 - 10	25	23	0.022	4.5
	12 - 14	16	6.9	0.01	0.07
	16 - 18	22	8.2	0.01	0.065

KKR-20-036

	Depth	PCB	Cr	Pb	Hg	PAH
561.0	0 - 1	0.71	59.9	113	0.17	63.3
NE	1 - 2	1.6	62.8	130	0.2	97

MKE-NAV20-08

	Depth	PCB	Cr	Pb	Hg	PAH
558.0	0 - 1	0.0085	73	130	0.17	1.9
	1 - 3	0.058	93	200	0.23	4.3
	3 - 5	0.075	260	430	0.42	3.4
	5 - 7	0.068	310	220	1	10.6
	7 - 9	0.005	96	40	0.2	5.1
	9 - 11	0.0055	19	8.8	0.02	0.12
	11 - 13	0.0048	11	6.2	0.014	0.13

KKR-20-035

	Depth	PCB	Cr	Pb	Hg	PAH
562.0	0 - 1	0.87	65.9	132	0.15	70.3
3	1 - 3	0.7	99.8	145	0.25	89.9
	3 - 4.9	0.0022	16.8	7.6	0.013	0.017

KK-SDA22

	Depth	Cr	Pb	Hg	PAH
568.3	14 - 16	19	7.1	0.0084	0.069
	18 - 20	20	7.7	0.01	0.19

KKR-20-039

	Depth	PCB	Cr	Pb	Hg	PAH
558.7	0 - 1	1.2	75	130	0.26	76.3
2.5	1 - 2.5	2.7	150	330	0.43	103
	2.5 - 5	0.0025	20	14	0.023	0.19

KKR-20-038

	Depth	PCB	Cr	Pb	Hg	PAH
571.5	0 - 1	1.1	98	180	0.27	36.2
NE	1 - 3	1.6	110	220	0.35	35.9
	3 - 5	1.6	190	420	0.33	30.3
	5 - 6.3	2.6	510	770	0.41	117

Car Ferry Slip

Municipal Slip

Grand Trunk Slip

Kinnickinnic River

Direction of Flow

See Figure 6-1G

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent
- Kinnickinnic River Project Area
- UG — Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss) 1 - 3		>PEC	>PEC
3 - 5		>3xPEC	>3xPEC
5 - 50		>5xPEC	>5xPEC
>50			

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration; TSCA = Toxic Substances Control Act

Figure 7-1F
Recommended Remedial Alternative
Kinnickinnic River - Reach 3
Map 2 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-22-001

	Depth	PCB	Cr	Pb	Hg	PAH
575.8	0 - 1	3.52	42	130	0.084	61
NE	1 - 2	1.58	41	120	0.075	171
	2 - 3	10.6	97	560	0.16	117
	5 - 6	18.2	120	330	0.2	112
	6 - 7	5.32	140	190	0.27	108
	7 - 8.1	0.037	-	-	-	144
	10 - 11	0.75	-	-	-	8.14
	11 - 12	0.75	-	-	-	0.15
	12 - 13	0.75	-	-	-	0.15
	13 - 13.7	0.7	-	-	-	0.15

KKR-22-002

	Depth	PCB	Cr	Pb	Hg	PAH
576.1	0 - 1	8.7	130	320	0.26	74.6
NE	1 - 2	28.9	340	610	0.42	223
	2 - 3	17.9	770	420	0.76	211
	3 - 3.8	0.65	540	240	1.2	148
	5 - 6	0.85	32	170	0.39	32

KK-SDA23

	Depth	Cr	Pb	Hg	PAH
574.4	0 - 0.3	130	270	0.27	92
	0.3 - 2	220	530	0.34	128
	4 - 6	21000	1500	1.5	174
	6 - 8	40000	1200	2.5	101
	8 - 10	28000	590	2.7	132
	12 - 14	30000	440	2.1	107
	14 - 16	11000	240	1.1	66.4
	16 - 18	27	9.1	0.014	0.49
	20 - 21	37	10	0.015	0.096

KKR-22-003

	Depth	PCB	Cr	Pb	Hg	PAH
576.8	0 - 1	42	250	660	0.4	161
NE	1 - 2	59	1200	3600	1.1	223
	2 - 3.1	1.05	11000	470	1.1	302
	5 - 6	1.05	10000	270	1.4	113
	6 - 7	1.1	3100	210	0.7	154
	7 - 8	1	370	160	0.54	154
	10 - 11	1.05	27	57	0.25	16.4
	11 - 12	0.95	6.4	3.2	0.012	0.31
	12 - 13	0.85	11	5	0.014	1.81
	13 - 14	0.85	11	5.1	0.015	0.26

KKR-21-057

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1	57	552	467	0.58	147
NE	1 - 3	171	736	593	0.88	199
	3 - 4.3	0.11	1790	653	1.7	173

KKR-21-056

	Depth	PCB	Cr	Pb	Hg	PAH
578.8	0 - 1	14	180	223	0.36	159
NE	1 - 2.9	88	694	494	0.63	284

KKR-20-031

	Depth	PCB	Cr	Pb	Hg	PAH
579.1	0 - 1	49	169	321	0.39	128
NE	1 - 3	280	840	716	1.3	150
	3 - 4.7	21	844	460	0.87	94.8

KKR-21-054

	Depth	PCB	Cr	Pb	Hg	PAH
579.8	0.6 - 0.9	7.8	84.6	201	0.13	24.5
NE						

KKR-20-033

	Depth	PCB	Cr	Pb	Hg	PAH
572.2	0 - 1	1.4	58.6	170	0.23	78.5
NE	1 - 3	1.7	110	366	0.35	93
	3 - 5	11.2	835	960	0.47	230
	5 - 7	3.2	253	263	0.89	237
	7 - 8	0.086	232	315	1.3	371

KKR-22-007

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	3.14	70	140	0.2	57.1
NE	1 - 2	18.8	440	530	0.37	181
	5 - 6	36.2	280	470	0.45	187
	6 - 7	32.4	250	410	0.59	169
	7 - 8.2	1.81	470	390	1.4	311
	10 - 11	0.7	1400	1100	1.1	226
	11 - 12	0.7	570	370	1.8	264
	12 - 13	0.7	860	340	1.6	273
	13 - 14.2	0.7	1800	380	1.5	295

KKR-21-055A

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0.5 - 1.2	19.8	132	247	0.27	67.8
NE						

KKR-21-055

	Depth	PCB	Cr	Pb	Hg	PAH
577.7	0 - 0.8	17.9	166	166	0.14	435
NE						

KKR-22-006

	Depth	PCB	Cr	Pb	Hg	PAH
577.8	0 - 1.3	183	450	590	0.44	204
NE						

KKR-22-004

	Depth	PCB	Cr	Pb	Hg	PAH
573.3	0 - 1	8.3	97	210	0.2	70
16.1	1 - 2	13.4	150	360	0.25	117
	2 - 3	14.5	960	1000	0.42	267
	3 - 3.9	59.9	180	620	0.51	186
	5 - 6	0.35	10000	570	1.5	96.7
	6 - 7	0.9	11000	250	1.4	126
	7 - 8	0.85	7500	240	1.3	149
	8 - 8.8	0.9	2300	200	1.4	226
	10 - 11	1.05	13000	550	3.3	201

KKR-22-008

	Depth	PCB	Cr	Pb	Hg	PAH
574.4	0 - 1	19.9	150	250	0.25	71.9
NE	1 - 2	14.3	670	640	0.38	127
	2 - 2.7	124	330	610	0.57	176
	5 - 6	34.3	300	400	0.8	185
	6 - 7	26	730	500	1.3	194
	7 - 7.8	0.85	1300	620	0.46	283
	10 - 11	1.2	8600	800	1.2	258
	11 - 12	1.5	46000	3000	2.2	287
	12 - 13.2	1.65	57000	7400	3.8	281

KKR-22-005

	Depth	PCB	Cr	Pb	Hg	PAH
575.4	0 - 1	25.8	200	330	0.3	87.1
NE	1 - 2	135	500	650	0.7	274
	2 - 2.5	221	470	540	0.65	229
	5 - 6	63.4	380	440	0.84	204
	6 - 7	6.96	5200	810	1.3	204
	7 - 8	1.4	16000	2200	2.4	252
	10 - 11	0.467	19000	1600	2	164
	11 - 12	1.85	13000	1400	2.8	171
	12 - 13	1.3	24000	510	2.8	134

KKR-20-032

	Depth	PCB	Cr	Pb	Hg	PAH
577.9	0 - 1	22.9	180	425	0.37	161
NE	1 - 3	86	569	535	0.76	180
	3 - 5	7.6	1370	984	1.3	267
	5 - 6.6	0.0041	3610	196	0.5	89.6

Kinnickinnic River
Direction of Flow
Grand Trunk Slip
UG
OHE

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- TSCA Sediment Extent
- TSCA Removal Reinforcement
- Kinnickinnic River Project Area
- Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 580 - 585
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration; TSCA = Toxic Substances Control Act

Figure 7-1G
Recommended Remedial Alternative
Kinnickinnic River - Grand Trunk Detail
Reach 3 - Map 3 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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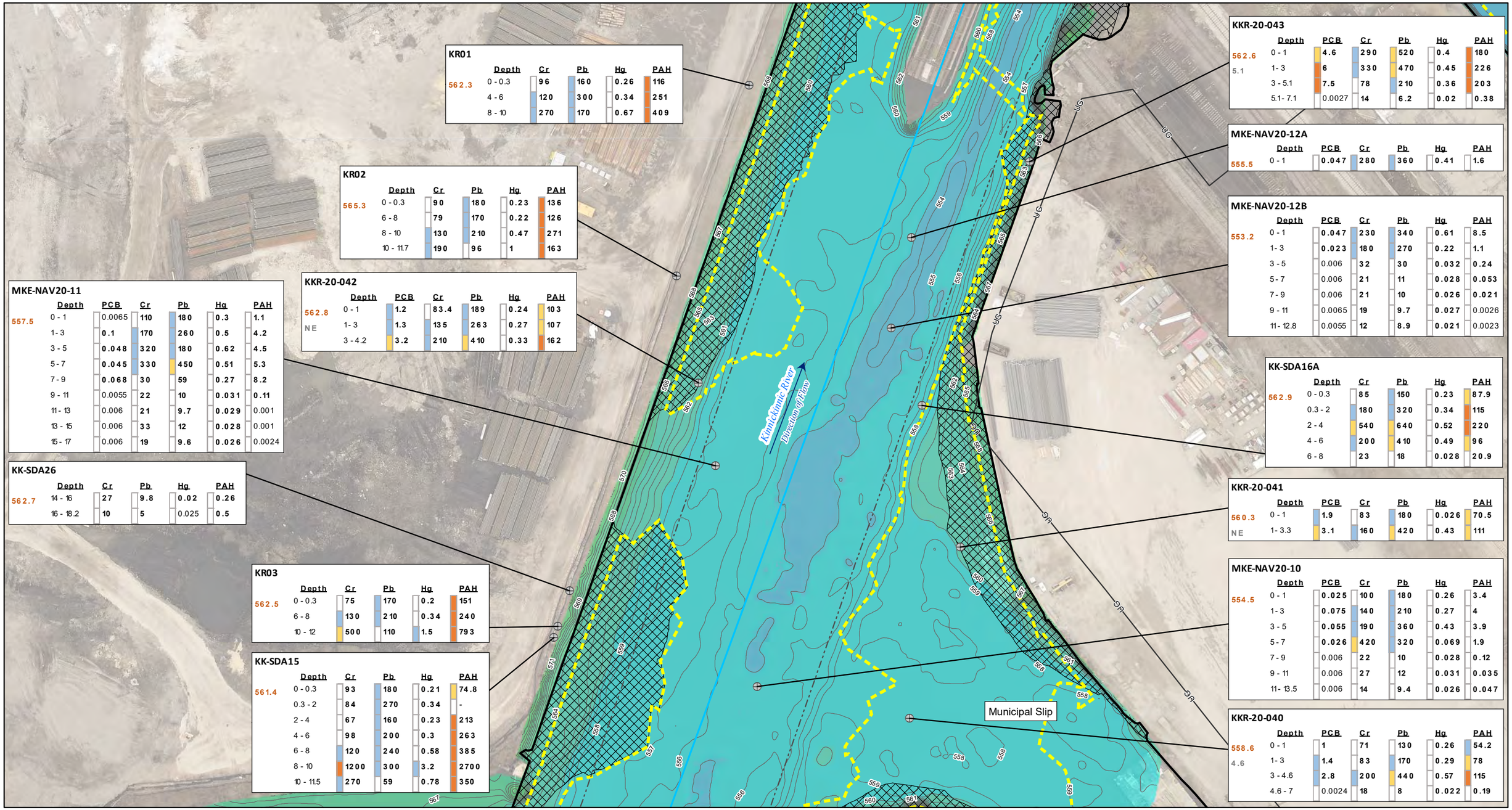


KR01

	Depth	Cr	Pb	Hg	PAH
562.3	0 - 0.3	96	160	0.26	116
	4 - 6	120	300	0.34	251
	8 - 10	270	170	0.67	409

KR02

	Depth	Cr	Pb	Hg	PAH
565.3	0 - 0.3	90	180	0.23	136
	6 - 8	79	170	0.22	126
	8 - 10	130	210	0.47	271
	10 - 11.7	190	96	1	163

KKR-20-042

	Depth	PCB	Cr	Pb	Hg	PAH
562.8	0 - 1	1.2	83.4	189	0.24	103
NE	1 - 3	1.3	135	263	0.27	107
	3 - 4.2	3.2	210	410	0.33	162

MKE-NAV20-11

	Depth	PCB	Cr	Pb	Hg	PAH
557.5	0 - 1	0.0065	110	180	0.3	1.1
	1 - 3	0.1	170	260	0.5	4.2
	3 - 5	0.048	320	180	0.62	4.5
	5 - 7	0.045	330	450	0.51	5.3
	7 - 9	0.068	30	59	0.27	8.2
	9 - 11	0.0055	22	10	0.031	0.11
	11 - 13	0.006	21	9.7	0.029	0.001
	13 - 15	0.006	33	12	0.028	0.001
	15 - 17	0.006	19	9.6	0.026	0.0024

KK-SDA26

	Depth	Cr	Pb	Hg	PAH
562.7	14 - 16	27	9.8	0.02	0.26
	16 - 18.2	10	5	0.025	0.5

KR03

	Depth	Cr	Pb	Hg	PAH
562.5	0 - 0.3	75	170	0.2	151
	6 - 8	130	210	0.34	240
	10 - 12	500	110	1.5	793

KK-SDA15

	Depth	Cr	Pb	Hg	PAH
561.4	0 - 0.3	93	180	0.21	74.8
	0.3 - 2	84	270	0.34	-
	2 - 4	67	160	0.23	213
	4 - 6	98	200	0.3	263
	6 - 8	120	240	0.58	385
	8 - 10	1200	300	3.2	2700
	10 - 11.5	270	59	0.78	350

KKR-20-043

	Depth	PCB	Cr	Pb	Hg	PAH
562.6	0 - 1	4.6	290	520	0.4	180
5.1	1 - 3	6	330	470	0.45	226
	3 - 5.1	7.5	78	210	0.36	203
	5.1 - 7.1	0.0027	14	6.2	0.02	0.38

MKE-NAV20-12A

	Depth	PCB	Cr	Pb	Hg	PAH
555.5	0 - 1	0.047	280	360	0.41	1.6

MKE-NAV20-12B

	Depth	PCB	Cr	Pb	Hg	PAH
553.2	0 - 1	0.047	230	340	0.61	8.5
	1 - 3	0.023	180	270	0.22	1.1
	3 - 5	0.006	32	30	0.032	0.24
	5 - 7	0.006	21	11	0.028	0.053
	7 - 9	0.006	21	10	0.026	0.021
	9 - 11	0.0065	19	9.7	0.027	0.0026
	11 - 12.8	0.0055	12	8.9	0.021	0.0023

KK-SDA16A

	Depth	Cr	Pb	Hg	PAH
562.9	0 - 0.3	85	150	0.23	87.9
	0.3 - 2	180	320	0.34	115
	2 - 4	540	640	0.52	220
	4 - 6	200	410	0.49	96
	6 - 8	23	18	0.028	20.9

KKR-20-041

	Depth	PCB	Cr	Pb	Hg	PAH
560.3	0 - 1	1.9	83	180	0.026	70.5
NE	1 - 3.3	3.1	160	420	0.43	111

MKE-NAV20-10

	Depth	PCB	Cr	Pb	Hg	PAH
554.5	0 - 1	0.025	100	180	0.26	3.4
	1 - 3	0.075	140	210	0.27	4
	3 - 5	0.055	190	360	0.43	3.9
	5 - 7	0.026	420	320	0.069	1.9
	7 - 9	0.006	22	10	0.028	0.12
	9 - 11	0.006	27	12	0.031	0.035
	11 - 13.5	0.006	14	9.4	0.026	0.047

KKR-20-040

	Depth	PCB	Cr	Pb	Hg	PAH
558.6	0 - 1	1	71	130	0.26	54.2
4.6	1 - 3	1.4	83	170	0.29	78
	3 - 4.6	2.8	200	440	0.57	115
	4.6 - 7	0.0024	18	8	0.022	0.19

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Federal Navigation Channel
- Kinnickinnic River Project Area
- UG — Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 3

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555

N

0 37.5 75

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

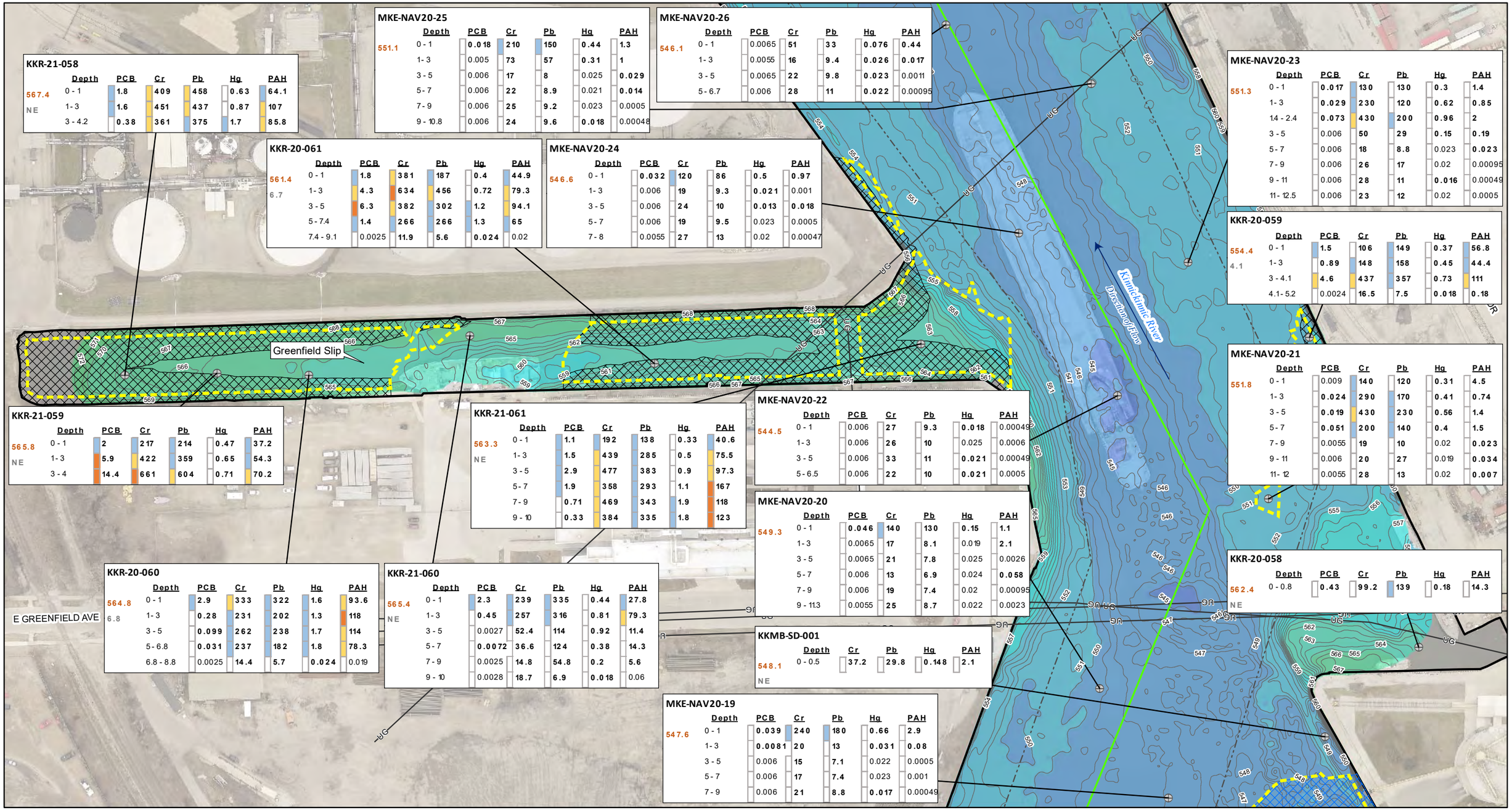
"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAHs = polycyclic aromatic hydrocarbons; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1H
Recommended Remedial Alternative
Kinnickinnic River - Reach 3
Map 4 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



KKR-21-058

	Depth	PCB	Cr	Pb	Hg	PAH
567.4	0 - 1	1.8	409	458	0.63	64.1
NE	1 - 3	1.6	451	437	0.87	107
	3 - 4.2	0.38	361	375	1.7	85.8

MKE-NAV20-25

	Depth	PCB	Cr	Pb	Hg	PAH
551.1	0 - 1	0.018	210	150	0.44	1.3
	1 - 3	0.005	73	57	0.31	1
	3 - 5	0.006	17	8	0.025	0.029
	5 - 7	0.006	22	8.9	0.021	0.014
	7 - 9	0.006	25	9.2	0.023	0.0005
	9 - 10.8	0.006	24	9.6	0.018	0.00048

MKE-NAV20-26

	Depth	PCB	Cr	Pb	Hg	PAH
546.1	0 - 1	0.0065	51	33	0.076	0.44
	1 - 3	0.0055	16	9.4	0.026	0.017
	3 - 5	0.0065	22	9.8	0.023	0.0011
	5 - 6.7	0.006	28	11	0.022	0.00095

KKR-20-061

	Depth	PCB	Cr	Pb	Hg	PAH
561.4	0 - 1	1.8	381	187	0.4	44.9
6.7	1 - 3	4.3	634	456	0.72	79.3
	3 - 5	6.3	382	302	1.2	94.1
	5 - 7.4	1.4	266	266	1.3	65
	7.4 - 9.1	0.0025	11.9	5.6	0.024	0.02

MKE-NAV20-24

	Depth	PCB	Cr	Pb	Hg	PAH
546.6	0 - 1	0.032	120	86	0.5	0.97
	1 - 3	0.006	19	9.3	0.021	0.001
	3 - 5	0.006	24	10	0.013	0.018
	5 - 7	0.006	19	9.5	0.023	0.0005
	7 - 8	0.0055	27	13	0.02	0.00047

MKE-NAV20-23

	Depth	PCB	Cr	Pb	Hg	PAH
551.3	0 - 1	0.017	130	130	0.3	1.4
	1 - 3	0.029	230	120	0.62	0.85
	1.4 - 2.4	0.073	430	200	0.96	2
	3 - 5	0.006	50	29	0.15	0.19
	5 - 7	0.006	18	8.8	0.023	0.023
	7 - 9	0.006	26	17	0.02	0.00095
	9 - 11	0.006	28	11	0.016	0.00049
	11 - 12.5	0.006	23	12	0.02	0.0005

KKR-20-059

	Depth	PCB	Cr	Pb	Hg	PAH
554.4	0 - 1	1.5	106	149	0.37	56.8
4.1	1 - 3	0.89	148	158	0.45	44.4
	3 - 4.1	4.6	437	357	0.73	111
	4.1 - 5.2	0.0024	16.5	7.5	0.018	0.18

KKR-21-059

	Depth	PCB	Cr	Pb	Hg	PAH
565.8	0 - 1	2	217	214	0.47	37.2
NE	1 - 3	5.9	422	359	0.65	54.3
	3 - 4	14.4	661	604	0.71	70.2

KKR-21-061

	Depth	PCB	Cr	Pb	Hg	PAH
563.3	0 - 1	1.1	192	138	0.33	40.6
NE	1 - 3	1.5	439	285	0.5	75.5
	3 - 5	2.9	477	383	0.9	97.3
	5 - 7	1.9	358	293	1.1	167
	7 - 9	0.71	469	343	1.9	118
	9 - 10	0.33	384	335	1.8	123

MKE-NAV20-22

	Depth	PCB	Cr	Pb	Hg	PAH
544.5	0 - 1	0.006	27	9.3	0.018	0.00049
	1 - 3	0.006	26	10	0.025	0.0006
	3 - 5	0.006	33	11	0.021	0.00049
	5 - 6.5	0.006	22	10	0.021	0.0005

MKE-NAV20-21

	Depth	PCB	Cr	Pb	Hg	PAH
551.8	0 - 1	0.009	140	120	0.31	4.5
	1 - 3	0.024	290	170	0.41	0.74
	3 - 5	0.019	430	230	0.56	1.4
	5 - 7	0.051	200	140	0.4	1.5
	7 - 9	0.0055	19	10	0.02	0.023
	9 - 11	0.006	20	27	0.019	0.034
	11 - 12	0.0055	28	13	0.02	0.007

MKE-NAV20-20

	Depth	PCB	Cr	Pb	Hg	PAH
549.3	0 - 1	0.046	140	130	0.15	1.1
	1 - 3	0.0065	17	8.1	0.019	2.1
	3 - 5	0.0065	21	7.8	0.025	0.0026
	5 - 7	0.006	13	6.9	0.024	0.058
	7 - 9	0.006	19	7.4	0.02	0.00095
	9 - 11.3	0.0055	25	8.7	0.022	0.0023

KKR-20-058

	Depth	PCB	Cr	Pb	Hg	PAH
562.4	0 - 0.8	0.43	99.2	139	0.18	14.3
NE						

KKR-20-060

	Depth	PCB	Cr	Pb	Hg	PAH
564.8	0 - 1	2.9	333	322	1.6	93.6
6.8	1 - 3	0.28	231	202	1.3	118
	3 - 5	0.099	262	238	1.7	114
	5 - 6.8	0.031	237	182	1.8	78.3
	6.8 - 8.8	0.0025	14.4	5.7	0.024	0.019

KKR-21-060

	Depth	PCB	Cr	Pb	Hg	PAH
565.4	0 - 1	2.3	239	335	0.44	27.8
NE	1 - 3	0.45	257	316	0.81	79.3
	3 - 5	0.0027	52.4	114	0.92	11.4
	5 - 7	0.0072	36.6	124	0.38	14.3
	7 - 9	0.0025	14.8	54.8	0.2	5.6
	9 - 10	0.0028	18.7	6.9	0.018	0.06

KKMB-SD-001

	Depth	Cr	Pb	Hg	PAH
548.1	0 - 0.5	37.2	29.8	0.148	2.1
NE					

MKE-NAV20-19

	Depth	PCB	Cr	Pb	Hg	PAH
547.6	0 - 1	0.039	240	180	0.66	2.9
	1 - 3	0.0081	20	13	0.031	0.08
	3 - 5	0.006	15	7.1	0.022	0.0005
	5 - 7	0.006	17	7.4	0.023	0.001
	7 - 9	0.006	21	8.8	0.017	0.00049

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Sand cover extent for Alternative 3A
- Kinnickinnic River Project Area
- UG — Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 4

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Sample interval (ft bss)	<1	<PEC	<PEC
	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1l
Recommended Remedial Alternative
Kinnickinnic River- - Reach 4
Map 1 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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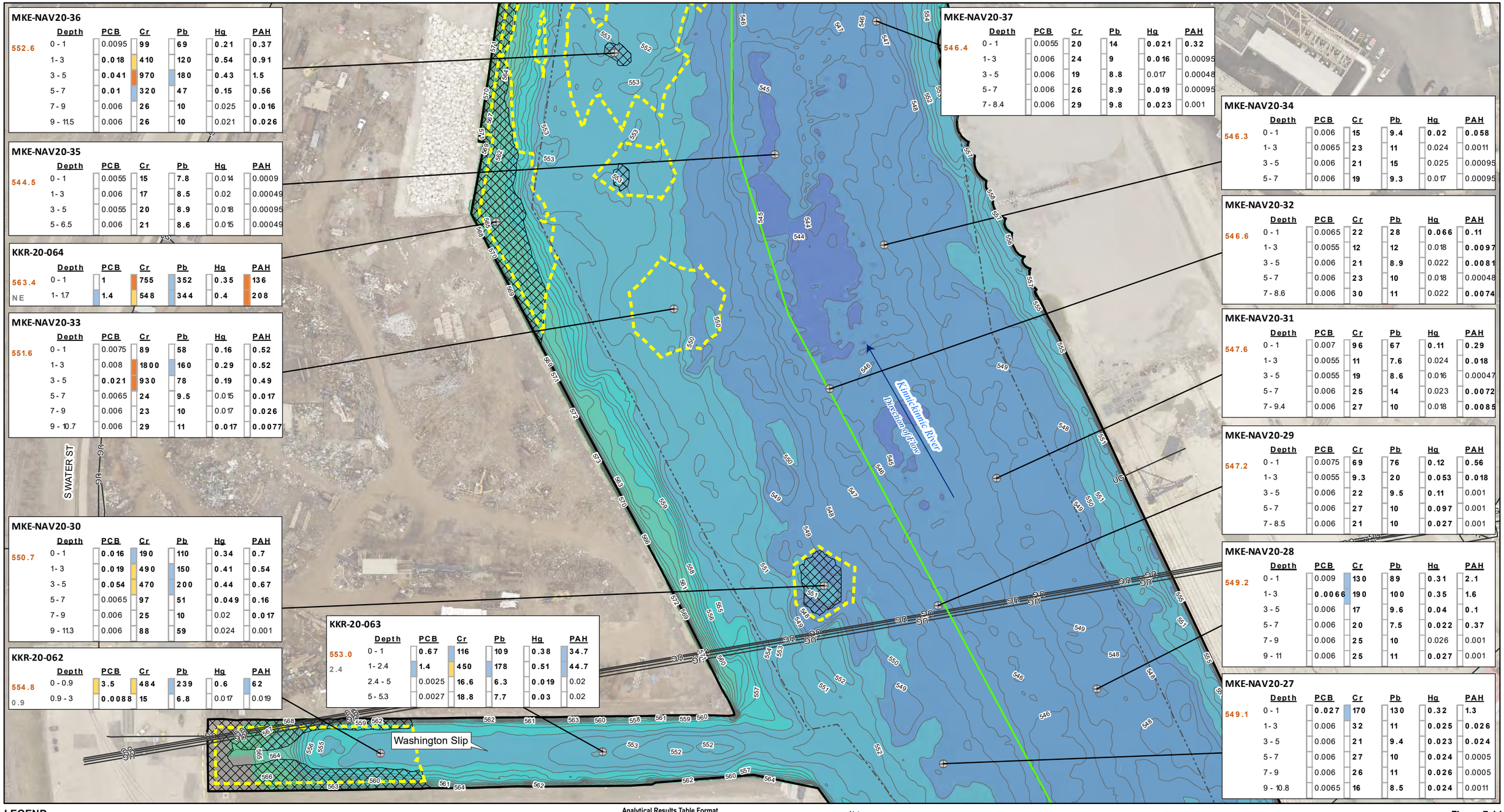

MKE-NAV20-36

	Depth	PCB	Cr	Pb	Hg	PAH
552.6	0 - 1	0.0095	99	69	0.21	0.37
	1 - 3	0.018	410	120	0.54	0.91
	3 - 5	0.041	970	180	0.43	1.5
	5 - 7	0.01	320	47	0.15	0.56
	7 - 9	0.006	26	10	0.025	0.016
	9 - 11.5	0.006	26	10	0.021	0.026

MKE-NAV20-35

	Depth	PCB	Cr	Pb	Hg	PAH
544.5	0 - 1	0.0055	15	7.8	0.014	0.0009
	1 - 3	0.006	17	8.5	0.02	0.00049
	3 - 5	0.0055	20	8.9	0.018	0.00095
	5 - 6.5	0.006	21	8.6	0.015	0.00049

KKR-20-064

	Depth	PCB	Cr	Pb	Hg	PAH
563.4	0 - 1	1	755	352	0.35	136
NE	1 - 1.7	1.4	548	344	0.4	208

MKE-NAV20-33

	Depth	PCB	Cr	Pb	Hg	PAH
551.6	0 - 1	0.0075	89	58	0.16	0.52
	1 - 3	0.008	1800	160	0.29	0.52
	3 - 5	0.021	930	78	0.19	0.49
	5 - 7	0.0065	24	9.5	0.015	0.017
	7 - 9	0.006	23	10	0.017	0.026
	9 - 10.7	0.006	29	11	0.017	0.0077

MKE-NAV20-30

	Depth	PCB	Cr	Pb	Hg	PAH
550.7	0 - 1	0.016	190	110	0.34	0.7
	1 - 3	0.019	490	150	0.41	0.54
	3 - 5	0.054	470	200	0.44	0.67
	5 - 7	0.0065	97	51	0.049	0.16
	7 - 9	0.006	25	10	0.02	0.017
	9 - 11.3	0.006	88	59	0.024	0.001

KKR-20-062

	Depth	PCB	Cr	Pb	Hg	PAH
554.8	0 - 0.9	3.5	484	239	0.6	62
0.9	0.9 - 3	0.0088	15	6.8	0.017	0.019

KKR-20-063

	Depth	PCB	Cr	Pb	Hg	PAH
553.0	0 - 1	0.67	116	109	0.38	34.7
2.4	1 - 2.4	1.4	450	178	0.51	44.7
	2.4 - 5	0.0025	16.6	6.3	0.019	0.02
	5 - 5.3	0.0027	18.8	7.7	0.03	0.02

MKE-NAV20-37

	Depth	PCB	Cr	Pb	Hg	PAH
546.4	0 - 1	0.0055	20	14	0.021	0.32
	1 - 3	0.006	24	9	0.016	0.00095
	3 - 5	0.006	19	8.8	0.017	0.00048
	5 - 7	0.006	26	8.9	0.019	0.00095
	7 - 8.4	0.006	29	9.8	0.023	0.001

MKE-NAV20-34

	Depth	PCB	Cr	Pb	Hg	PAH
546.3	0 - 1	0.006	15	9.4	0.02	0.058
	1 - 3	0.0065	23	11	0.024	0.0011
	3 - 5	0.006	21	15	0.025	0.00095
	5 - 7	0.006	19	9.3	0.017	0.00095

MKE-NAV20-32

	Depth	PCB	Cr	Pb	Hg	PAH
546.6	0 - 1	0.0065	22	28	0.066	0.11
	1 - 3	0.0055	12	12	0.018	0.0097
	3 - 5	0.006	21	8.9	0.022	0.0081
	5 - 7	0.006	23	10	0.018	0.00048
	7 - 8.6	0.006	30	11	0.022	0.0074

MKE-NAV20-31

	Depth	PCB	Cr	Pb	Hg	PAH
547.6	0 - 1	0.007	96	67	0.11	0.29
	1 - 3	0.0055	11	7.6	0.024	0.018
	3 - 5	0.0055	19	8.6	0.016	0.00047
	5 - 7	0.006	25	14	0.023	0.0072
	7 - 9.4	0.006	27	10	0.018	0.0085

MKE-NAV20-29

	Depth	PCB	Cr	Pb	Hg	PAH
547.2	0 - 1	0.0075	69	76	0.12	0.56
	1 - 3	0.0055	9.3	20	0.053	0.018
	3 - 5	0.006	22	9.5	0.11	0.001
	5 - 7	0.006	27	10	0.097	0.001
	7 - 8.5	0.006	21	10	0.027	0.001

MKE-NAV20-28

	Depth	PCB	Cr	Pb	Hg	PAH
549.2	0 - 1	0.009	130	89	0.31	2.1
	1 - 3	0.0066	190	100	0.35	1.6
	3 - 5	0.006	17	9.6	0.04	0.1
	5 - 7	0.006	20	7.5	0.022	0.37
	7 - 9	0.006	25	10	0.026	0.001
	9 - 11	0.006	25	11	0.027	0.001

MKE-NAV20-27

	Depth	PCB	Cr	Pb	Hg	PAH
549.1	0 - 1	0.027	170	130	0.32	1.3
	1 - 3	0.006	32	11	0.025	0.026
	3 - 5	0.006	21	9.4	0.023	0.024
	5 - 7	0.006	27	10	0.024	0.0005
	7 - 9	0.006	26	11	0.026	0.0005
	9 - 10.8	0.0065	16	8.5	0.024	0.0011

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 4

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1J
Recommended Remedial Alternative
Kinnickinnic River - Reach 4
Map 2 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

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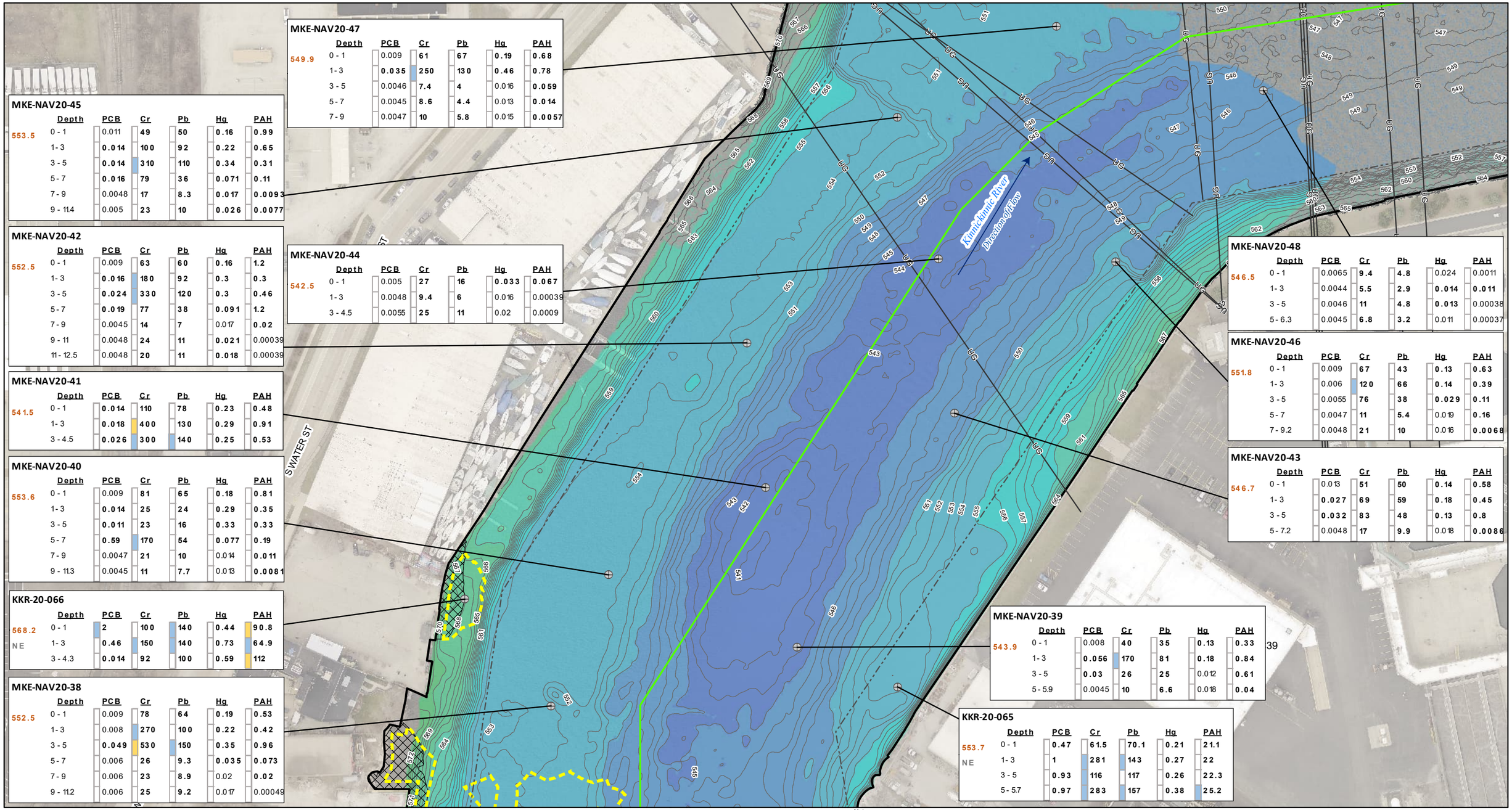


MKE-NAV20-45

	Depth	PCB	Cr	Pb	Hg	PAH
553.5	0 - 1	0.011	49	50	0.16	0.99
	1 - 3	0.014	100	92	0.22	0.65
	3 - 5	0.014	310	110	0.34	0.31
	5 - 7	0.016	79	36	0.071	0.11
	7 - 9	0.0048	17	8.3	0.017	0.0093
	9 - 11.4	0.005	23	10	0.026	0.0077

MKE-NAV20-47

	Depth	PCB	Cr	Pb	Hg	PAH
549.9	0 - 1	0.009	61	67	0.19	0.68
	1 - 3	0.035	250	130	0.46	0.78
	3 - 5	0.0046	7.4	4	0.016	0.059
	5 - 7	0.0045	8.6	4.4	0.013	0.014
	7 - 9	0.0047	10	5.8	0.015	0.0057

MKE-NAV20-42

	Depth	PCB	Cr	Pb	Hg	PAH
552.5	0 - 1	0.009	63	60	0.16	1.2
	1 - 3	0.016	180	92	0.3	0.3
	3 - 5	0.024	330	120	0.3	0.46
	5 - 7	0.019	77	38	0.091	1.2
	7 - 9	0.0045	14	7	0.017	0.02
	9 - 11	0.0048	24	11	0.021	0.00039
	11 - 12.5	0.0048	20	11	0.018	0.00039

MKE-NAV20-44

	Depth	PCB	Cr	Pb	Hg	PAH
542.5	0 - 1	0.005	27	16	0.033	0.067
	1 - 3	0.0048	9.4	6	0.016	0.00039
	3 - 4.5	0.0055	25	11	0.02	0.0009

MKE-NAV20-41

	Depth	PCB	Cr	Pb	Hg	PAH
541.5	0 - 1	0.014	110	78	0.23	0.48
	1 - 3	0.018	400	130	0.29	0.91
	3 - 4.5	0.026	300	140	0.25	0.53

MKE-NAV20-40

	Depth	PCB	Cr	Pb	Hg	PAH
553.6	0 - 1	0.009	81	65	0.18	0.81
	1 - 3	0.014	25	24	0.29	0.35
	3 - 5	0.011	23	16	0.33	0.33
	5 - 7	0.59	170	54	0.077	0.19
	7 - 9	0.0047	21	10	0.014	0.011
	9 - 11.3	0.0045	11	7.7	0.013	0.0081

KKR-20-066

	Depth	PCB	Cr	Pb	Hg	PAH
568.2	0 - 1	2	100	140	0.44	90.8
NE	1 - 3	0.46	150	140	0.73	64.9
	3 - 4.3	0.014	92	100	0.59	112

MKE-NAV20-38

	Depth	PCB	Cr	Pb	Hg	PAH
552.5	0 - 1	0.009	78	64	0.19	0.53
	1 - 3	0.008	270	100	0.22	0.42
	3 - 5	0.049	530	150	0.35	0.96
	5 - 7	0.006	26	9.3	0.035	0.073
	7 - 9	0.006	23	8.9	0.02	0.02
	9 - 11.2	0.006	25	9.2	0.017	0.00049

MKE-NAV20-48

	Depth	PCB	Cr	Pb	Hg	PAH
546.5	0 - 1	0.0065	9.4	4.8	0.024	0.0011
	1 - 3	0.0044	5.5	2.9	0.014	0.011
	3 - 5	0.0046	11	4.8	0.013	0.00038
	5 - 6.3	0.0045	6.8	3.2	0.011	0.00037

MKE-NAV20-46

	Depth	PCB	Cr	Pb	Hg	PAH
551.8	0 - 1	0.009	67	43	0.13	0.63
	1 - 3	0.006	120	66	0.14	0.39
	3 - 5	0.0055	76	38	0.029	0.11
	5 - 7	0.0047	11	5.4	0.019	0.16
	7 - 9.2	0.0048	21	10	0.016	0.0068

MKE-NAV20-43

	Depth	PCB	Cr	Pb	Hg	PAH
546.7	0 - 1	0.013	51	50	0.14	0.58
	1 - 3	0.027	69	59	0.18	0.45
	3 - 5	0.032	83	48	0.13	0.8
	5 - 7.2	0.0048	17	9.9	0.018	0.0086

MKE-NAV20-39

	Depth	PCB	Cr	Pb	Hg	PAH
543.9	0 - 1	0.008	40	35	0.13	0.33
	1 - 3	0.056	170	81	0.18	0.84
	3 - 5	0.03	26	25	0.012	0.61
	5 - 5.9	0.0045	10	6.6	0.018	0.04

KKR-20-065

	Depth	PCB	Cr	Pb	Hg	PAH
553.7	0 - 1	0.47	61.5	70.1	0.21	21.1
NE	1 - 3	1	281	143	0.27	22
	3 - 5	0.93	116	117	0.26	22.3
	5 - 5.7	0.97	283	157	0.38	25.2

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Kinnickinnic River Project Area
- UG — Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas
- Reach 4

Bathymetry (feet)
- Bathymetric Contour

Elevation (feet)
- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
<1	<PEC	<PEC	<PEC
Sample interval (ft bss) 1 - 3	>PEC	>PEC	>PEC
3 - 5	>3xPEC	>3xPEC	>3xPEC
5 - 50	>5xPEC	>5xPEC	>5xPEC
>50			

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; FFS = Focused Feasibility Study; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration
6. Bathymetric surface point data provided by Seaworks within portions of this figure extent contained gaps and therefore the derived colored shading is not continuous

Figure 7-1K
Recommended Remedial Alternative
Kinnickinnic River - Reach 4
Map 3 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKR-21-062

	Depth	PCB	Cr	Pb	Hg	PAH
568.2	0 - 1	0.94	189	149	0.45	51.7
NE	1 - 3	1.3	188	215	0.68	130
	3 - 5	0.088	38.8	93.3	0.23	36
	5 - 7	0.021	16.8	42.3	0.07	31.5
	7 - 7.4	0.0081	8	25.7	0.033	13.5

MKE-NAV20-49

	Depth	PCB	Cr	Pb	Hg	PAH
549.8	0 - 1	0.0085	100	100	0.23	0.32
	1 - 3	0.034	200	140	0.5	0.68
	3 - 5	0.054	460	200	0.63	2.3
	5 - 7	0.15	350	170	0.39	1.2
	7 - 9	0.0045	11	6.3	0.017	0.00037

MKE-NAV20-50

	Depth	PCB	Cr	Pb	Hg	PAH
549.9	0 - 1	0.017	71	67	0.04	1.4
	1 - 3	0.007	100	91	0.023	0.33
	3 - 5	0.006	15	6.6	0.021	0.038
	5 - 7	0.006	14	6.5	0.015	0.038
	7 - 9	0.0045	4.2	2	0.012	0.00037

KKR-20-067

	Depth	PCB	Cr	Pb	Hg	PAH
566.5	0 - 1	0.15	193	183	0.77	215
NE	1 - 3	0.0012	181	192	0.78	525
	3 - 5	0.017	153	273	0.86	1060
	5 - 6.5	0.0044	127	205	0.76	91.8

MKE-NAV20-47

	Depth	PCB	Cr	Pb	Hg	PAH
549.9	0 - 1	0.009	61	67	0.19	0.68
	1 - 3	0.035	250	130	0.46	0.78
	3 - 5	0.0046	7.4	4	0.016	0.059
	5 - 7	0.0045	8.6	4.4	0.013	0.014
	7 - 9	0.0047	10	5.8	0.015	0.0057

KKR-20-068

	Depth	PCB	Cr	Pb	Hg	PAH
547.1	0 - 1.3	0.11	29.9	23.2	0.061	4.7
1.3	1.3 - 2.1	0.0023	19.3	9	0.022	0.19

KKR-20-069

	Depth	PCB	Cr	Pb	Hg	PAH
547.4	0 - 0.3	0.42	40.6	52.5	0.12	24.5
0.3	0.3 - 1.2	0.0009	13.5	6.8	0.014	0.014

MKE-NAV20-48

	Depth	PCB	Cr	Pb	Hg	PAH
546.5	0 - 1	0.0065	9.4	4.8	0.024	0.0011
	1 - 3	0.0044	5.5	2.9	0.014	0.011
	3 - 5	0.0046	11	4.8	0.013	0.00038
	5 - 6.3	0.0045	6.8	3.2	0.011	0.00037

MKE-NAV20-44

	Depth	PCB	Cr	Pb	Hg	PAH
542.5	0 - 1	0.005	27	16	0.033	0.067
	1 - 3	0.0048	9.4	6	0.016	0.00039
	3 - 4.5	0.0055	25	11	0.02	0.0009

MKE-NAV20-46

	Depth	PCB	Cr	Pb	Hg	PAH
551.8	0 - 1	0.009	67	43	0.13	0.63
	1 - 3	0.006	120	66	0.14	0.39
	3 - 5	0.0055	76	38	0.029	0.11
	5 - 7	0.0047	11	5.4	0.019	0.16
	7 - 9.2	0.0048	21	10	0.016	0.0068

MKE-NAV20-45

	Depth	PCB	Cr	Pb	Hg	PAH
553.5	0 - 1	0.011	49	50	0.16	0.99
	1 - 3	0.014	100	92	0.22	0.65
	3 - 5	0.014	310	110	0.34	0.31
	5 - 7	0.016	79	36	0.071	0.11
	7 - 9	0.0048	17	8.3	0.017	0.0093
	9 - 11.4	0.005	23	10	0.026	0.0077

Milwaukee River
Direction of Flow
Kinnickinnic River
Direction of Flow
E ERIE ST
794

LEGEND

- Results also included on the adjoining figure
- Analytical Sample Location
- Sediment Dredge Extent
- Kinnickinnic River Project Area
- UG — Underground Utility
- Federal Navigation Channel

Kinnickinnic River Reach Areas

- Reach 4

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
Native Material Depth	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; FFS = Focused Feasibility Study; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration
6. Bathymetric surface point data provided by Seaworks within portions of this figure extent contained gaps and therefore the derived colored shading is not continuous

Figure 7-1L
Recommended Remedial Alternative
Kinnickinnic River - Reach 4
Map 4 of 4
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

KKMB-SD-004

	Depth	PCB	Cr	Pb	Hg	PAH
552.1	0 - 0.5	0.075	53.4	51.5	0.121	2.3
	0.5 - 1.5	0.042	28.2	15.1	0.151	0.84
	1.5 - 2.3	0.014	22	7.97	0.312	0.08

KKMB-SD-004B

	Depth	PCB	Cr	Pb	Hg	PAH
552.1	0.5 - 2.3	0.015	22.5	8.61	0.0212	0.19
NE	1.5 - 3.8	0.015	21	6.82	0.0185	0.048

KKMB-SD-010

	Depth	Cr	Pb	Hg	PAH
552.2	0 - 0.5	169	209	0.536	2.9
NE	0.5 - 1.5	351	280	0.619	3.7
	1.5 - 2.5	412	297	0.78	3.3
	2.5 - 3.5	433	344	0.757	2.8
	3.5 - 5	386	400	0.862	16.5

KKR-20-055

	Depth	PCB	Cr	Pb	Hg	PAH
550.7	0 - 1	2.4	217	416	0.41	33.8
NE	1 - 3	4.9	311	351	0.74	45.3
	3 - 5	6.3	352	415	0.85	67
	5 - 5.6	6.1	380	476	1	65.6

KKMB-SD-005

	Depth	Cr	Pb	Hg	PAH
550.2	0 - 0.5	262	270	0.71	12.7
NE	0.5 - 1.5	309	586	1.4	18.5
	1.5 - 2.5	220	162	0.773	10.8
	2.5 - 3.5	68	58.4	0.186	5.8
	3.5 - 4.5	19.9	16.1	0.0416	0.71
	4.5 - 5.5	9.54	4.84	0.0203	0.47
	5.5 - 6.4	55.5	20.2	0.0701	0.68

KKR-20-048

	Depth	PCB	Cr	Pb	Hg	PAH
548.9	0 - 1	0.59	115	138	0.43	96.9
1.8	1 - 1.8	0.56	147	153	0.42	47.4
	1.8 - 2.3	0.074	21.8	9.5	0.024	0.53

KKR-20-049

	Depth	PCB	Cr	Pb	Hg	PAH
545.7	0 - 1	0.33	248	182	5.9	84.3
NE	1 - 3	0.5	331	157	1.2	70.8
	3 - 3.8	0.0026	34.6	12.4	0.2	17.4

KKR-20-054

	Depth	PCB	Cr	Pb	Hg	PAH
551.7	0 - 1	0.87	112	134	0.48	42.3
NE	1 - 3	1.5	186	186	0.5	54.4
	3 - 5	6.2	280	325	0.76	87.5
	5 - 7.1	11.3	321	415	1	127

KKR-20-050

	Depth	PCB	Cr	Pb	Hg	PAH
556.0	0 - 1	0.38	133	125	0.39	45.9
NE	1 - 1.7	0.96	128	142	0.35	36

KKMB-SD-009

	Depth	Cr	Pb	Hg	PAH
550.2	0 - 0.5	427	528	0.979	14.7
NE	0.5 - 1.5	315	388	1.03	14.5
	1.5 - 2.5	296	480	0.968	17.7
	2.5 - 3.5	316	532	1.35	13
	3.5 - 4.5	312	582	1.28	18.5
	4.5 - 5.5	415	465	2.17	20.2
	5.5 - 6.5	188	178	0.864	10.5
	6.5 - 7.5	246	220	1.23	12.2
	7.5 - 8.5	18.5	12.6	0.0314	1.8
	8.5 - 9.5	7.13	5.82	0.233	0.11
	9.5 - 10.5	6.04	4.84	0.225	0.021
	10.5 - 11.8	6.32	4.91	0.225	0.021

KKR-20-053

	Depth	PCB	Cr	Pb	Hg	PAH
549.2	0 - 1	3.1	204	235	0.68	55.6
5.0	1 - 3	7.2	289	475	0.64	72.1
	3 - 5	0.83	162	193	1.1	62.7
	5 - 5.4	0.0018	11.8	6.8	0.013	0.014

KKMB-SD-006

	Depth	Cr	Pb	Hg	PAH
552.8	0 - 0.5	165	207	0.611	33.9
NE	0.5 - 1.5	49.1	40.5	0.0743	6.4
	1.5 - 2.5	187	167	1.11	17.6
	2.5 - 3.5	323	363	0.927	6.8
	3.5 - 4.5	176	187	0.527	7.8
	4.5 - 5.5	276	409	1.35	12.9
	5.5 - 6.5	82	326	0.387	7.5
	6.5 - 7.5	15.6	38.4	0.0755	2.5
	7.5 - 8	15.3	10	0.0989	0.54

KKR-20-051

	Depth	PCB	Cr	Pb	Hg	PAH
550.9	0 - 1	0.91	120	138	0.34	32.6
1.9	1 - 2.3	1.7	148	127	0.21	25.5

KKMB-SD-007

	Depth	PCB	Cr	Pb	Hg	PAH
553.2	0 - 0.5	0.65	154	176	0.334	3.7
NE	0.5 - 1.5	0.42	181	183	0.502	2.7
	1.5 - 2.5	3.1	233	297	0.595	4.9
	2.5 - 3.5	1.2	207	246	0.486	6.9
	3.5 - 4	1.1	198	249	0.443	9.7

KKMB-SD-008

	Depth	Cr	Pb	Hg	PAH
552.0	0 - 0.5	383	503	1.11	8
4.6	0.5 - 1.5	298	451	0.913	5.5
	1.5 - 2.5	182	187	0.689	5.6
	2.5 - 3.5	216	82.4	0.794	18.4
	3.5 - 4.6	351	91.8	1.02	7.7
	4.6 - 5.3	14	11.1	0.215	0.043

KKR-20-052

	Depth	PCB	Cr	Pb	Hg	PAH
552.2	0 - 1	0.92	101	109	0.4	36.2
NE	1 - 3	2.4	180	221	0.51	46.8
	3 - 3.5	0.0021	103	71	0.75	63.4

S HARBOR DR

S CARFERRY DR

Turning Basin

UG

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Sand cover extent for Alternative 3A
- Kinnickinnic River Project Area
- UG Underground Utility

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss)	1 - 3	>PEC	>PEC
	3 - 5	>3xPEC	>3xPEC
	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

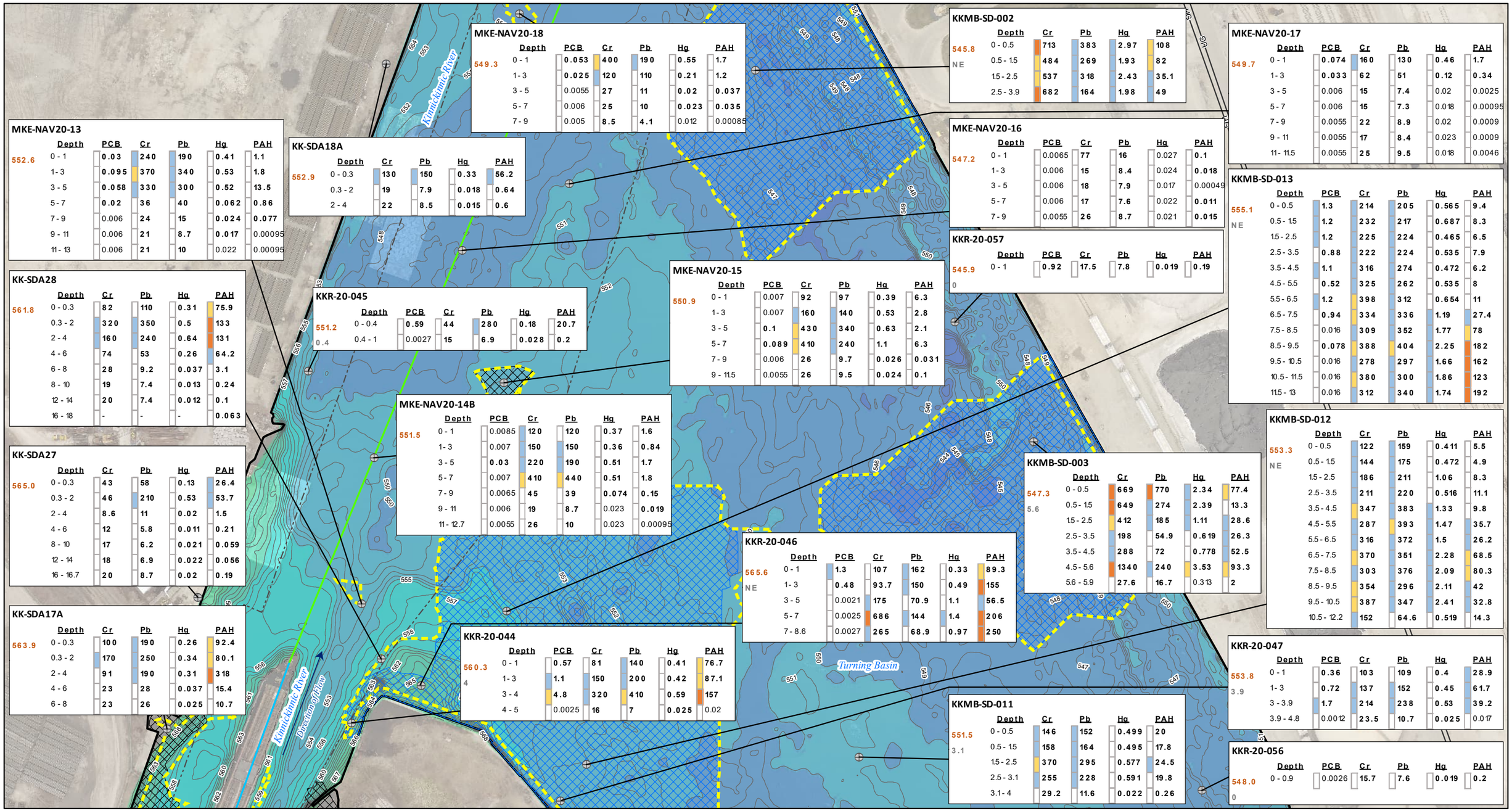
NE = Native Material Not Encountered

Notes:

1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1M
Recommended Remedial Alternative
Kinnickinnic River - Turning Basin
Map 1 of 2
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



MKE-NAV20-13

	Depth	PCB	Cr	Pb	Hg	PAH
552.6	0 - 1	0.03	240	190	0.41	1.1
	1 - 3	0.095	370	340	0.53	1.8
	3 - 5	0.058	330	300	0.52	13.5
	5 - 7	0.02	36	40	0.062	0.86
	7 - 9	0.006	24	15	0.024	0.077
	9 - 11	0.006	21	8.7	0.017	0.00095
	11 - 13	0.006	21	10	0.022	0.00095

KK-SDA28

	Depth	Cr	Pb	Hg	PAH
561.8	0 - 0.3	82	110	0.31	75.9
	0.3 - 2	320	350	0.5	133
	2 - 4	160	240	0.64	131
	4 - 6	74	53	0.26	64.2
	6 - 8	28	9.2	0.037	3.1
	8 - 10	19	7.4	0.013	0.24
	12 - 14	20	7.4	0.012	0.1
	16 - 18	-	-	-	0.063

KK-SDA27

	Depth	Cr	Pb	Hg	PAH
565.0	0 - 0.3	43	58	0.13	26.4
	0.3 - 2	46	210	0.53	53.7
	2 - 4	8.6	11	0.02	1.5
	4 - 6	12	5.8	0.011	0.21
	8 - 10	17	6.2	0.021	0.059
	12 - 14	18	6.9	0.022	0.056
	16 - 16.7	20	8.7	0.02	0.19

KK-SDA17A

	Depth	Cr	Pb	Hg	PAH
563.9	0 - 0.3	100	190	0.26	92.4
	0.3 - 2	170	250	0.34	80.1
	2 - 4	91	190	0.31	318
	4 - 6	23	28	0.037	15.4
	6 - 8	23	26	0.025	10.7

KK-SDA18A

	Depth	Cr	Pb	Hg	PAH
552.9	0 - 0.3	130	150	0.33	56.2
	0.3 - 2	19	7.9	0.018	0.64
	2 - 4	22	8.5	0.015	0.6

MKE-NAV20-18

	Depth	PCB	Cr	Pb	Hg	PAH
549.3	0 - 1	0.053	400	190	0.55	1.7
	1 - 3	0.025	120	110	0.21	1.2
	3 - 5	0.0055	27	11	0.02	0.037
	5 - 7	0.006	25	10	0.023	0.035
	7 - 9	0.005	8.5	4.1	0.012	0.00085

KKR-20-045

	Depth	PCB	Cr	Pb	Hg	PAH
551.2	0 - 0.4	0.59	44	280	0.18	20.7
0.4	0.4 - 1	0.0027	15	6.9	0.028	0.2

MKE-NAV20-14B

	Depth	PCB	Cr	Pb	Hg	PAH
551.5	0 - 1	0.0085	120	120	0.37	1.6
	1 - 3	0.007	150	150	0.36	0.84
	3 - 5	0.03	220	190	0.51	1.7
	5 - 7	0.007	410	440	0.51	1.8
	7 - 9	0.0065	45	39	0.074	0.15
	9 - 11	0.006	19	8.7	0.023	0.019
	11 - 12.7	0.0055	26	10	0.023	0.00095

KKR-20-044

	Depth	PCB	Cr	Pb	Hg	PAH
560.3	0 - 1	0.57	81	140	0.41	76.7
4	1 - 3	1.1	150	200	0.42	87.1
	3 - 4	4.8	320	410	0.59	157
	4 - 5	0.0025	16	7	0.025	0.02

MKE-NAV20-15

	Depth	PCB	Cr	Pb	Hg	PAH
550.9	0 - 1	0.007	92	97	0.39	6.3
	1 - 3	0.007	160	140	0.53	2.8
	3 - 5	0.1	430	340	0.63	2.1
	5 - 7	0.089	410	240	1.1	6.3
	7 - 9	0.006	26	9.7	0.026	0.031
	9 - 11.5	0.0055	26	9.5	0.024	0.1

KKR-20-046

	Depth	PCB	Cr	Pb	Hg	PAH
565.6	0 - 1	1.3	107	162	0.33	89.3
NE	1 - 3	0.48	93.7	150	0.49	155
	3 - 5	0.0021	175	70.9	1.1	56.5
	5 - 7	0.0025	686	144	1.4	206
	7 - 8.6	0.0027	265	68.9	0.97	250

KKMB-SD-002

	Depth	Cr	Pb	Hg	PAH
545.8	0 - 0.5	713	383	2.97	108
NE	0.5 - 1.5	484	269	1.93	82
	1.5 - 2.5	537	318	2.43	35.1
	2.5 - 3.9	682	164	1.98	49

MKE-NAV20-16

	Depth	PCB	Cr	Pb	Hg	PAH
547.2	0 - 1	0.0065	77	16	0.027	0.1
	1 - 3	0.006	15	8.4	0.024	0.018
	3 - 5	0.006	18	7.9	0.017	0.00049
	5 - 7	0.006	17	7.6	0.022	0.011
	7 - 9	0.0055	26	8.7	0.021	0.015

KKR-20-057

	Depth	PCB	Cr	Pb	Hg	PAH
545.9	0 - 1	0.92	17.5	7.8	0.019	0.19
0						

KKMB-SD-003

	Depth	Cr	Pb	Hg	PAH
547.3	0 - 0.5	669	770	2.34	77.4
5.6	0.5 - 1.5	649	274	2.39	13.3
	1.5 - 2.5	412	185	1.11	28.6
	2.5 - 3.5	198	54.9	0.619	26.3
	3.5 - 4.5	288	72	0.778	52.5
	4.5 - 5.6	1340	240	3.53	93.3
	5.6 - 5.9	27.6	16.7	0.313	2

KKMB-SD-011

	Depth	Cr	Pb	Hg	PAH
551.5	0 - 0.5	146	152	0.499	20
3.1	0.5 - 1.5	158	164	0.495	17.8
	1.5 - 2.5	370	295	0.577	24.5
	2.5 - 3.1	255	228	0.591	19.8
	3.1 - 4	29.2	11.6	0.022	0.26

MKE-NAV20-17

	Depth	PCB	Cr	Pb	Hg	PAH
549.7	0 - 1	0.074	160	130	0.46	1.7
	1 - 3	0.033	62	51	0.12	0.34
	3 - 5	0.006	15	7.4	0.02	0.0025
	5 - 7	0.006	15	7.3	0.018	0.00095
	7 - 9	0.0055	22	8.9	0.02	0.0009
	9 - 11	0.0055	17	8.4	0.023	0.0009
	11 - 11.5	0.0055	25	9.5	0.018	0.0046

KKMB-SD-013

	Depth	PCB	Cr	Pb	Hg	PAH
555.1	0 - 0.5	1.3	214	205	0.565	9.4
NE	0.5 - 1.5	1.2	232	217	0.687	8.3
	1.5 - 2.5	1.2	225	224	0.465	6.5
	2.5 - 3.5	0.88	222	224	0.535	7.9
	3.5 - 4.5	1.1	316	274	0.472	6.2
	4.5 - 5.5	0.52	325	262	0.535	8
	5.5 - 6.5	1.2	398	312	0.654	11
	6.5 - 7.5	0.94	334	336	1.19	27.4
	7.5 - 8.5	0.016	309	352	1.77	78
	8.5 - 9.5	0.078	388	404	2.25	182
	9.5 - 10.5	0.016	278	297	1.66	162
	10.5 - 11.5	0.016	380	300	1.86	123
	11.5 - 13	0.016	312	340	1.74	192

KKMB-SD-012

	Depth	Cr	Pb	Hg	PAH
553.3	0 - 0.5	122	159	0.411	5.5
NE	0.5 - 1.5	144	175	0.472	4.9
	1.5 - 2.5	186	211	1.06	8.3
	2.5 - 3.5	211	220	0.516	11.1
	3.5 - 4.5	347	383	1.33	9.8
	4.5 - 5.5	287	393	1.47	35.7
	5.5 - 6.5	316	372	1.5	26.2
	6.5 - 7.5	370	351	2.28	68.5
	7.5 - 8.5	303	376	2.09	80.3
	8.5 - 9.5	354	296	2.11	42
	9.5 - 10.5	387	347	2.41	32.8
	10.5 - 12.2	152	64.6	0.519	14.3

KKR-20-047

	Depth	PCB	Cr	Pb	Hg	PAH
553.8	0 - 1	0.36	103	109	0.4	28.9
3.9	1 - 3	0.72	137	152	0.45	61.7
	3 - 3.9	1.7	214	238	0.53	39.2
	3.9 - 4.8	0.0012	23.5	10.7	0.025	0.017

KKR-20-056

	Depth	PCB	Cr	Pb	Hg	PAH
548.0	0 - 0.9	0.0026	15.7	7.6	0.019	0.2
0						

LEGEND

- Analytical Sample Location
- Sediment Dredge Extent
- Cap Extent
- Sand cover extent for Alternative 3A
- Federal Navigation Channel
- Kinnickinnic River Project Area
- UG — Underground Utility

Kinnickinnic River Reach Areas

- Reach 3
- Reach 4

Bathymetry (feet)

- Bathymetric Contour

Elevation (feet)

- 575 - 580
- 570 - 575
- 565 - 570
- 560 - 565
- 555 - 560
- 550 - 555
- 545 - 550
- 540 - 545

N

0 60 120

Approximate scale in feet

Analytical Results Table Format

Location ID

Mudline Elevation

Native Material Depth

Depth	PCBs (mg/kg)	Metals (mg/kg)	PAHs (mg/kg)
	<1	<PEC	<PEC
Sample interval (ft bss) 1 - 3	1 - 3	>PEC	>PEC
3 - 5	3 - 5	>3xPEC	>3xPEC
5 - 50	5 - 50	>5xPEC	>5xPEC
	>50		

Bold values represent results above the detection limit

"-" = COC was not sampled/analyzed

NE = Native Material Not Encountered

Notes:
1. 2020 Aerial Photography provided by The Milwaukee County Land Information Office
2. Horizontal Datum: North American Datum 1983 (NAD83)
3. Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Bathymetric contour and shading were generated from hydrographic survey data collected by Seaworks (2020).
4. PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication Number WT-732 2003 (Wisconsin Department of Natural Resources 2003).
5. 3x = 3 times; 5x = 5 times; COC = contaminant of concern; Cr = chromium; ft bss = feet below sediment surface; Hg = mercury; mg/kg = milligram(s) per kilogram; NE = not encountered; PAH = polycyclic aromatic hydrocarbon; Pb = lead; PCB = polychlorinated biphenyl; PEC = Probable effects concentration

Figure 7-1N
Recommended Remedial Alternative
Kinnickinnic River - Turning Basin
Map 2 of 2
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Appendix A
Kinnickinnic River Project Area – Sediment Analytical Results Summary

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

					PCB											PAH												
Analyte Group					PCB											PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8														
WI CBSQG PEC					3										68.4														
WI CBSQG PEC					5										114														
TSCA					50																								
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MKE-FNC01	MKE-NAV20-01-0-1	0	1	10/8/2020	**0.07**	0.019 U	0.0087 U	0.0065 U	0.035 U	0.0092 U	0.0098 U	0.014 U	0.0067 U	**0.07**	**4.7**	0.12 U	0.094 U	0.092 U	0.092 U	**0.34 J+**	**0.25 J**	**0.64 J**	**0.13 J**	**0.17 J**	**0.17 J**	**0.3 J**	0.12 U	**0.91 J+**	0.13 U	**0.25 J**
MKE-FNC01	MKE-NAV20-01-1-3	1	3	10/8/2020	**0.039**	0.0073 U	0.0033 U	0.0025 U	0.013 U	0.0035 U	0.0037 U	0.0053 U	0.0025 U	**0.039**	**4.9**	0.092 U	0.072 U	0.07 U	0.07 U	**0.38 J+**	**0.28 J+**	**0.69 J**	**0.14 J**	**0.16 J**	**0.18 J**	**0.33**	0.092 U	**0.98 J+**	0.1 U	**0.29**
MKE-FNC01	MKE-NAV20-01-3-5	3	5	10/8/2020	**0.051**	0.0053 U	0.0024 U	0.0018 U	0.0095 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	**0.051**	**1.2**	0.017 U	0.013 U	0.013 U	**0.022 J**	**0.11 J+**	**0.081**	**0.18 J**	**0.036 J**	**0.044**	**0.049**	**0.086**	0.017 U	**0.22**	0.018 U	**0.085**
MKE-FNC01	MKE-NAV20-01-5-7	5	7	10/8/2020	0.0044 U	0.0048 U	0.0022 U	0.0016 U	0.0087 U	0.0023 U	0.0025 U	0.0035 U	0.0017 U	0.0016 U	**0.059**	0.0012 U	0.00095 U	0.00093 U	0.00093 U	**0.0046 J+**	**0.0032**	**0.0082 J**	**0.0016 J**	**0.0022 J**	**0.0022 J**	**0.004**	0.0012 U	**0.012**	0.0013 U	**0.004**
MKE-FNC01	MKE-NAV20-01-7-9	7	9	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.0069**	0.00059 U	0.00046 U	0.00045 U	0.00045 U	0.00046 U	0.00059 U	0.00046 UJ	0.00059 U	0.00059 U	0.00065 U	0.00046 U	0.00059 U	**0.0012 J**	0.00065 U	0.00059 U
MKE-FNC01	MKE-NAV20-01-9-11	9	11	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.014**	0.0012 U	0.00092 U	0.0009 U	0.0009 U	0.00092 U	0.0012 U	0.00092 UJ	0.0012 U	0.0012 U	0.0013 U	0.00092 U	0.0012 U	**0.0027 J**	0.0013 U	0.0012 U
MKE-FNC01	MKE-NAV20-01-11-13	11	13	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	0.00035 U	0.00059 U	0.00046 U	0.00045 U	0.00045 U	0.00046 U	0.00059 U	0.00046 UJ	0.00059 U	0.00059 U	0.00065 U	0.00046 U	0.00059 U	0.00069 U	0.00065 U	0.00059 U
MKE-FNC01	MKE-NAV20-01-13-15	13	15	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.0072**	0.00059 U	**0.00055 J**	0.00045 U	0.00045 U	0.00046 U	0.00059 U	0.00046 UJ	0.00059 U	0.00059 U	0.00065 U	0.00046 U	0.00059 U	**0.00086 J**	0.00065 U	0.00059 U
MKE-FNC02	MKE-NAV20-02-0-1	0	1	10/8/2020	**0.036**	0.0075 U	0.0034 U	0.0025 U	0.014 U	0.0036 U	0.0039 U	0.0055 U	0.0026 U	**0.036**	**3.1**	0.095 U	0.074 U	0.072 U	0.072 U	**0.23 J**	**0.17 J**	**0.47 J**	**0.1 J**	**0.12 J**	**0.11 J**	**0.23 J**	0.095 U	**0.57 J+**	0.1 U	**0.19 J**
MKE-FNC02	MKE-NAV20-02-1-3	1	3	10/8/2020	**0.086 J**	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	**0.086 J**	**2.7**	0.042 U	0.033 U	0.032 U	**0.036 J**	**0.21 J**	**0.15 J+**	**0.37 J**	**0.082 J**	**0.094 J**	**0.1 J**	**0.19**	0.042 U	**0.49 J+**	0.046 U	**0.15**
MKE-FNC02	MKE-NAV20-02-3-5	3	5	10/8/2020	**0.096**	0.03 U	**0.096**	0.01 U	0.054 U	0.014 U	0.015 U	0.022 U	0.011 U	0.0096 U	**3.8**	0.038 U	0.03 U	0.029 U	**0.066 J**	**0.31 J**	**0.23 J**	**0.45 J**	**0.12 J**	**0.14 J**	**0.15 J**	**0.29 J**	0.038 U	**0.71 J**	**0.041 J**	**0.22 J**
MKE-FNC02	MKE-NAV20-02-5-7	5	7	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.058**	0.0029 U	0.0023 U	0.0022 U	0.0022 U	**0.004 J**	**0.0032 J**	**0.0078 J**	0.0029 U	0.0029 U	0.0032 UJ	**0.0041 J**	0.0029 U	**0.0094 J+**	0.0032 U	**0.0041 J**
MKE-FNC02	MKE-NAV20-02-7-9	7	9	10/8/2020	0.0046 U	0.005 U	0.0023 U	0.0017 U	0.0091 U	0.0024 U	0.0026 U	0.0036 U	0.0018 U	0.0016 U	**0.67**	0.013 U	0.0099 U	0.0096 U	**0.012 J**	**0.056 J**	**0.035 J+**	**0.084 J**	**0.018 J**	**0.02 J**	**0.024 J**	**0.049**	0.013 U	**0.13 J+**	0.014 U	**0.033**
MKE-FNC02	MKE-NAV20-02-9-11	9	11	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.047**	0.0012 U	0.00092 U	0.0009 U	**0.00095 J**	**0.0038 J**	**0.0023 J**	**0.0057 J**	0.0012 U	**0.0014 J**	**0.0018 J**	**0.0033**	0.0012 U	**0.0089 J+**	0.0013 U	**0.0023 J**
MKE-FNC02	MKE-NAV20-02-11-13	11	13	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0022 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.055**	**0.00077 J**	**0.0014 J**	0.00045 U	**0.0015**	**0.0048 J+**	**0.003 J+**	**0.0049 J**	**0.0014 J**	**0.0018**	**0.0019 J+**	**0.004**	0.00059 U	**0.0082 J+**	**0.0017**	**0.0031**
MKE-FNC02	MKE-NAV20-02-13-15	13	15	10/8/2020	0.0043 U	0.0047 U	0.0022 U	0.0016 U	0.0086 U	0.0023 U	0.0024 U	0.0034 U	0.0017 U	0.0015 U	**0.22**	0.0059 U	0.0047 U	0.0045 U	0.0045 U	**0.019 J+**	**0.012 J**	**0.03 J**	0.0059 U	**0.0073 J**	**0.0086 J**	**0.015**	0.0059 U	**0.039 J+**	0.0065 U	**0.012 J**
MKE-FNC02	MKE-NAV20-02-15-17	15	17	10/8/2020	0.0042 U	0.0046 U	0.0021 U	0.0016 U	0.0084 U	0.0022 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.026**	0.0012 U	0.00092 U	0.0009 U	0.0009 U	**0.0021 J**	**0.0013 J**	**0.0034 J**	0.0012 U	0.0012 U	0.0013 U	**0.0021 J**	0.0012 U	**0.0045 J+**	0.0013 U	**0.0013 J**
MKE-FNC03	MKE-NAV20-03-0-1	0	1	10/8/2020	0.0075 U	0.0081 U	0.0037 U	0.0027 U	0.015 U	0.0039 U	0.0041 U	0.0059 U	0.0028 U	0.0026 U	**2.4**	0.051 U	0.04 U	0.039 U	0.039 U	**0.18 J+**	**0.15**	**0.36 J**	**0.081 J**	**0.11 J**	**0.12 J**	**0.18**	0.051 UJ	**0.43**	0.056 U	**0.18**
MKE-FNC03	MKE-NAV20-03-1-3	1	3	10/8/2020	**0.039**	0.0073 U	0.0033 U	0.0025 U	0.013 U	0.0035 U	0.0037 U	0.0053 U	0.0026 U	**0.039**	**6.5**	0.092 U	0.072 U	0.07 U	**0.15 J**	**0.5 J+**	**0.37 J+**	**0.76 J**	**0.17 J**	**0.21 J**	**0.22 J**	**0.41**	0.092 UJ	**1.3 J+**	0.1 U	**0.35**
MKE-FNC03	MKE-NAV20-03-3-5	3	5	10/8/2020	**0.051**	0.0055 U	0.0025 U	0.0019 U	0.01 U	0.0027 U	0.0028 U	0.004 U	0.0019 U	**0.051**	**5.6**	0.14 U	0.11 U	0.11 U	0.11 U	**0.38 J**	**0.31 J**	**0.63 J**	**0.16 J**	**0.2 J**	**0.18 J**	**0.4**	0.14 U	**1.2 J+**	0.15 U	**0.32 J**
MKE-FNC03	MKE-NAV20-03-5-7	5	7	10/8/2020	**0.086**	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	**0.086**	**6**	0.16 U	0.13 U	0.13 U	0.13 U	**0.44 J**	**0.3 J**	**0.7 J**	**0.17 J**	**0.19 J**	**0.22 J**	**0.44**	0.16 U	**1.2 J+**	0.18 U	**0.32 J**
MKE-FNC03	MKE-NAV20-03-7-9	7	9	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0023 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.26**	0.0059 U	0.0046 U	0.0045 U	0.0045 U	**0.019 J**	**0.014 J**	**0.032 J**	**0.008 J**	**0.0093 J**	**0.0098 J**	**0.019**	0.0059 U	**0.055 J+**	0.0065 U	**0.014 J**
MKE-FNC03	MKE-NAV20-03-9-11	9	11	10/8/2020	0.0043 U	0.0047 U	0.0021 U	0.0016 U	0.0085 U	0.0022 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.086**	0.0029 U	0.0023 U	0.0023 U	0.0023 U	**0.0063 J**	**0.0045 J**	**0.0095 J**	0.0029 U	**0.0031 J**	**0.0033 J**	**0.0066 J**	0.0029 U	**0.017 J+**	0.0032 U	**0.0049 J**
MKE-FNC03	MKE-NAV20-03-11-13	11	13	10/8/2020	0.0042 U	0.0046 U	0.0021 U	0.0016 U	0.0084 U	0.0022 U	0.0024 U	0.0034 U	0.0016 U	0.0015 U	**0.019**	0.0012 U	0.00091 U	0.00089 U	0.00089 U	**0.0012 J**	0.0012 U	**0.0023 J**	0.0012 U	0.0012 U	0.0013 UJ	**0.0015 J**	0.0012 U	**0.0029 J**	0.0013 U	**0.0012 J**
MKE-FNC03	MKE-NAV20-03-13-14.2	13	14.2	10/8/2020	0.0045 U	0.0049 U	0.0022 U	0.0017 U	0.0089 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	**0.013**	0.0012 U	0.00097 U	0.00095 U	0.00095 U	0.00097 UJ	0.0012 U	0.00097 UJ	0.0012 U	0.0012 U	0.0014 UJ	0.00097 U	0.0012 U	**0.0019 J**	0.0014 U	0.0012 U
MKE-FNC04	MKE-NAV20-04-0-1	0	1	10/7/2020	0.0045 U	0.005 U	0.0023 U	0.0017 U	0.009 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	**0.022**	0.0012 U	0.00098 U	0.00095 U	0.00095 U	0.00098 U	0.0012 U	**0.0037 J**	0.0012 U	0.0012 U	0.0014 U	0.00098 U	0.0012 UJ	**0.0046 J+**	0.0014 U	0.0012 U
MKE-FNC04	MKE-NAV20-04-1-3	1	3	10/7/2020	0.0046 U	0.0051 U	0.0023 U	0.0017 U	0.0091 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	**0.039**	0.0013 U	0.001 U	0.00097 U	0.00097 U	**0.0033 J+**	0.0013 U	**0.0064 J**	**0.0013 J**	0.0013 U	0.0014 U	**0.0036 J+**	0.0013 UJ	**0.0083**	0.0014 U	0.0013 U
MKE-FNC04	MKE-NAV20-04-3-5	3	5	10/7/2020	**0.0072 J**	0.0051 U	0.0023 U	0.0017 U	0.0092 U	0.0024 U	**0.0072 J**	0.0037 U	0.0018 U	0.0016 U	**0.27**	0.0032 U	0.0025 U	**0.0032 J**	**0.0047 J**	**0.026 J+**	**0.017**	**0.037 J**	**0.008 J**	**0.011**	**0.012**	**0.019**	0.0032 UJ	**0.049**	0.0035 U	**0.018**
MKE-FNC04	MKE-NAV20-04-5-7	5	7	10/7/2020	0.0046 U	0.005 U	0.0023 U	0.0017 U	0.0091 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	**0.0057**	0.00063 U	0.00049 U	0.00048 U	0.00048 U	0.00049 U	0.00063 U	0.00049 UJ	0.00063 U	0.00063 U	0.00069 U	0.00049 U	0.00063 UJ	0.00074 U	0.00069 U	0.00063 U
MKE-FNC04	MKE-NAV20-04-7-9	7	9	10/7/2020	0.0046 U	0.005 U	0.0023 U	0.0017 U	0.0091 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	**0.0073**	0.00064 U	0.0005 U	0.00049 U	0.00049 U	0.0005 U	0.00064 U	0.0005 UJ	0.00064 U	0.00064 U	0.0007 U	0.0005 U	0.00064 UJ	**0.0018 J+**	0.0007 U	0.00064 U
MKE-FNC05	MKE-NAV20-05-0-1	0	1	10/7/2020	**0.018**	0.0088 U	0.004 U	0.003 U	0.016 U	0.0042 U	0.0045 U	0.0064 U	0.0031 U	**0.018**	**1.5**	0.11 U	0.087 U	0.085 U	0.085 U	**0.1 J**	0.11 U	**0.18 J**	0.11 U	0.11 UJ	0.12 UJ	**0.12 J**	0.11 UJ	**0.22 J**	0.12 U	0.11 UJ
MKE-FNC05	MKE-NAV20-05-1-3	1	3	10/7/2020	**0.023**	0.0076 U	0.0035 U	0.0026 U	0.014 U	0.0037 U	0.0039 U	0.0055 U	0.0027 U	**0.023**	**2.4**	0.048 U	0.037 U	0.037 U	0.037 U	**0.17 J**	**0.13 J**	**0.32 J**	**0.069 J**	**0.097 J**	**0.097 J**	**0.17 J**	0.048 UJ	**0.47 J**	0.052 U	**0.15 J**
MKE-FNC05	MKE-NAV20-05-3-5	3	5	10/7/2020	**0.054**	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	**0.054**	**2.9**	0.042 U	0.033 U	0.032 U	**0.036 J**	**0.22 J+**	**0.17**	**0.39 J**	**0.087 J**	**0.11**	**0.12**	**0.21**	0.042 UJ	**0.54**	0.047 U	**0.18**
MKE-FNC05	MKE-NAV20-05-5-7	5	7	10/7/2020	**0.12 J**	0.0061 U	0.0028 U	0.0021 U	0.011 U	0.003 U	**0.12 J**	0.0045 U	0.0022 U	0.002 U	**3**	0.019 U	**0.048 J**	0.015 U	**0.062**	**0.22 J+**	**0.17**	**0.32 J**	**0.076**	**0.094**	**0.12**	**0.21**	0.019 UJ	**0.61**	**0.072**	**0.17**
MKE-FNC05	MKE-NAV20-05-7-9	7	9	10/7/2020	**0.058**	0.0066 U	**0.058**	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**3.2**	**0.042 J**	**0.034 J**	0.032 U	**0.066 J**	**0.26 J+**	**0.18**	**0.35 J**	**0.082 J**	**0.095 J**	**0.12**	**0.22**	0.041 UJ	**0.51**	0.045 U	**0.17**
MKE-FNC05	MKE-NAV20-05-9-11	9	11	10/7/2020	0.0055 U	0.0061 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	**0.64**	0.0078 U	0.0061 U	0.0059 U	**0.013 J**	**0.046 J+**	**0.033**	**0.087 J**	**0.017 J**	**0.019 J**	**0.022**	**0.043**	0.0078 UJ	**0.12**	**0.0089 J**	**0.034**
MKE-FNC05	MKE-NAV20-05-11-13	11	13	10/7/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	**0.083**	0.0039 U	0.0031 U	0.003 U	0.003 U	**0.0062 J**	**0.0039 J**	**0.01 J**	0.0039 U	0.0039 U	0.0043 U	**0.0057 J**	0.0039 UJ	**0.013**	0.0043 U	**0.0041 J**
MKE-FNC05	MKE-NAV20-05-13-15	13	15	10/7/2020	0.0046 U	0.0051 U	0.0023 U	0.0017 U	0.0092 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	**0.025**	0.00064 U	0.0005 U	0.00049 U	**0.00053 J**	**0.002 J+**	0.00064 U	**0.004 J**	**0.00072 J**	0.00064 U	0.0007 U	**0.0019 J+**	0.00064 UJ	**0.0053 J+**	0.0007 U	**0.0018 J+**
MKE-FNC06	MKE-NAV20-06-0-1	0	1	10/7/2020	**0.056**	0.0085 U	0.0039 U	0.0029 U	0.015 U	0.0041 U	0.0044 U	0.0062 U	0.003 U	**0.056**	**4.4**	0.21 U	0.17 U	0.16 U	0.16 U	**0.29 J**	**0.23 J**	**0.58 J**	0.21 U	0.21 U	0.23 UJ	**0.31 J**	0.21 U	**0.82**	0.23 U	**0.21 J**
MKE-FNC06	MKE-NAV20-06-1-3	1	3	10/7/2020	**0.21**	0.027 U	0.012 U	0.009 U	0.048 U	0.013 U	0.014 U	0.019 U	0.0093 U	**0.21**	**3**	0.042 U	0.033 U	0.032 U	**0.05 J**	**0.23 J+**	**0.16**	**0.41 J**	**0.081 J**	**0.075 J**	**0.11 J**	**0.21**	0.042 U	**0.58**	0.046 U	**0.15**
MKE-FNC06	MKE-NAV20-06-3-5	3	5	10/7/2020	**0.049**	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	**0.049**	**3.8**	**0.099 J**	0.061 U	0.059 U	**0.08 J**	**0.27 J+**	**0.16 J**	**0.38 J**	**0.092 J**	0.078 U	**0.1 J**	**0.23**	0.078 U	**0.63**	0.085 U	**0.14 J**
MKE-FNC06	MKE-NAV20-06-5-7	5	7	10/7/2020	0.0055 U	0.0061 U	0.0028 U	0.0021 U	0.011 U	0.0029 U	0.0031 U	0.0044 U	0.0021 U	0.0019 U	**0.1**	0.0038 U	0.003 U	0.0029 U	0.0029 U	**0.0075 J**	**0.005 J**	**0.011 J**	0.0038 U	0.0038 U	0.0042 UJ	**0.0074 J**	0.0038 U	**0.02**	0.0042 U	**0.0044 J**
MKE-FNC06	MKE-NAV20-06-7-9	7	9	10/7/2020	0.006 U	0.0067 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.0049 U	0.0084 U	0.0066 U	0.0064 U	0.0064 U	0.0066 UJ	0.0084 U	0.0066 UJ	0.0084 U	0.0084 UJ	0.0092 UJ	0.0066 U	0.0084 UJ	0.0098 U	0.0092 U	0.0084 UJ
MKE-FNC06	MKE-NAV20-06-9-11	9	11	10/7/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.01 U	0.017 U	0.013 U	0.013 U	0.013 U	0.013 UJ	0.017 U	0.013 UJ	0.017 U	0.017 UJ	0.018 UJ	0.013 U	0.017 UJ	0.02 U	0.018 U	0.017 UJ
MKE-FNC06	MKE-NAV20-06-11-13	11	13	10/7/2020	0.0049 U	0.0054 U	0.0025 U	0.0018 U	0.0098 U	0.0026 U	0.0028 U	0.004 U	0.0019 U	0.0017 U	0.0008 U	0.0014 U	0.0011 U	0.001 U	0.001 U	0.0011 UJ	0.0014 U	0.0011 UJ	0.0014 U	0.0014 UJ	0.0015 UJ	0.0011 U	0.0014 UJ	0.0016 U	0.0015 U	0.0014 UJ
MKE-FNC06	MKE-NAV20-06-13-15	13	15	10/7/2020	0.0055 U	0.0058 U	0.0027 U	0.002 U	0.011 U	0.0028 U	0.003 U	0.0042 U	0.002 U	0.0019 U	**0.086**	0.0073 U	0.0057 U	0.0056 U	0.0056 U	0.0057 UJ	0.0073 U	**0.0075 J**	0.0073 U	0.0073 UJ	0.008 UJ	0.0057 U	0.0073 UJ	**0.014 J**	0.008 U	0.0073 UJ
MKE-FNC06	MKE-NAV20-06-15-16	15	16	10/7/2020	0.0046 U	0.0051 U	0.0023 U	0.0017 U	0.0092 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	0.0038 U	0.0064 U	0.005 U	0.0049 U	0.0049 U	0.005 UJ	0.0064 U	0.005 UJ	0.0064 U	0.0064 UJ	0.007 UJ	0.005 U	0.0064 UJ	0.0075 U	0.007 U	0.0064 UJ
MKE-FNC07	MKE-NAV20-07-0-1	0	1	10/7/2020	**0.078**	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	**0.078**	**3.8**	**0.046 J**	0.035 U	0.034 U	**0.052 J**	**0.29 J+**	**0.24**	**0.46 J**	**0.12**	**0.15**	**0.17 J**	**0.28**	0.044 U	**0.75**	0.049 U	**0.26**
MKE-FNC07	MKE-NAV20-07-1-3	1	3	10/7/2020	**0.12**	0.014 U	0.0064 U	0.0048 U	0.025 U	0.0068 U	0.0072 U	0.01 U	0.0049 U	**0.12**	**4.2**	**0.052 J**	**0.037 J**	0.034 U	**0.067 J**	**0.31 J+**	**0.23**	**0.55 J**	**0.11**	**0.12**	**0.15 J**	**0.27**	0.044 U	**0.82**	**0.05 J**	**0.23**
MKE-FNC07	MKE-NAV20-07-3-5	3	5	10/7/2020	**0.09**	0.013 U	0.0057 U	0.0043 U	0.023 U	0.0061 U	**0.09**	0.0092 U	0.0044 U	0.004 U	**2.5**	**0.036 J**	**0.028 J**	0.015 U	**0.053**	**0.19 J+**	**0.14**	**0.28 J**	**0.067**	**0.072**	**0.08 J**	**0.17**	0.02 U	**0.45**	**0.04 J**	**0.14**
MKE-FNC07	MKE-NAV20-07-5-7	5	7	10/7/2020	**0.16**	0.026 U	0.012 U	0.0087 U	0.046 U	0.012 U	0.013 U	0.019 U	0.009 U	**0.16**	**16.4**	**0.51 J+**	**0.3 J**	0.12 U	**0.33 J**	**1 J+**	**0.66**	**1.4 J**	**0.27 J**	**0.28 J**	**0.39 J**	**0.74**	0.16 U	**2**	**0.27 J**	**0.52**
MKE-FNC07	MKE-NAV20-07-7-9	7	9	10/7/2020	0.0055 U	0.006 U	0.0027 U	0.002 U	0.011 U	0.0029 U	0.0031 U	0.0043 U	0.0021 U	0.0019 U	**1**	**0.043 J+**	**0.017 J**	0.0058 U	**0.02**	**0.042 J+**	**0.023**	**0.048 J**	**0.01 J**	**0.0099 J**	**0.014 J**	**0.029**	0.0075 U	**0.088**	**0.018 J**	**0.017 J**
MKE-FNC07	MKE-NAV20-07-9-11	9	11	10/7/2020	0.0049 U	0.0053 U	0.0024 U	0.0018 U	0.0097 U	0.0026 U	0.0027 U	0.0039 U	0.0019 U	0.0017 U	**0.38**	**0.0091 J**	**0.0063 J**	0.0026 U	**0.0086 J**	**0.026 J**	**0.017 J**	**0.038 J**	**0.0071 J**	**0.0072 J**	**0.0089 J**	**0.019 J**	0.0034 U	**0.044 J**	**0.0063 J**	**0.013 J**
MKE-FNC07	MKE-NAV20-07-11-13.3	11	13.3	10/7/2020	0.0049 U	0.0054 U	0.0025 U	0.0018 U	0.0097 U	0.0026 U	0.0028 U	0.0039 U	0.0019 U	0.0017 U	**0.016**	0.00068 U	0.00053 U	0.00052 U	0.00052 U	0.00053 U	**0.001 J**	0.00053 UJ	0.00068 U	0.00068 U	0.00074 UJ	0.00053 U	0.00068 U	**0.0032**	0.00074 U	0.00068 U
MKE-FNC08	MKE-NAV20-08-0-1	0	1	10/7/2020	0.0085 U	0.0096 U	0.0044 U	0.0032 U	0.017 U	0.0046 U	0.0049 U	0.007 U	0.0034 U	0.0031 U	**1.9**	**0.34 J+**	0.095 U	0.092 U	0.092 U	**0.095 J**	0.12 U	**0.23 J**	0.12 U	0.12 UJ	0.13 UJ	**0.11 J**	0.12 UJ	**0.23 J**	0.13 U	0.12 UJ
MKE-FNC08	MKE-NAV20-08-1-3	1	3	10/7/2020	**0.058**	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0024 U	**0.058**	**4.3**	**0.1 J**	0.069 U	0.067 U	0.067 U	**0.34 J+**	**0.26**	**0.55 J**	**0.13 J**	**0.15 J**	**0.17 J**	**0.32**	0.088 U	**0.85**	0.096 U	**0.26**
MKE-FNC08	MKE-NAV20-08-3-5	3	5	10/7/2020	**0.075**	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	**0.075 J**	**3.4**	**0.052 J**	**0.033 J**	0.032 U	**0.048 J**	**0.26 J+**	**0.2**	**0.47 J**	**0.1 J**	**0.12**	**0.13 J**	**0.24**	0.042 U	**0.66**	0.046 U	**0.21**
MKE-FNC08	MKE-NAV20-08-5-7	5	7	10/7/2020	**0.068**	0.012 U	0.0056 U	0.0041 U	0.022 U	0.0059 U	0.0063 U	0.0089 U	0.0043 U	**0.068**	**10.6**	**0.16 J**	**0.23**	0.059 U	**0.34**	**0.94 J+**	**0.6**	**1 J**	**0.24**	**0.24**	**0.32 J**	**0.62**	0.077 U	**1.7**	**0.25**	**0.49**
MKE-FNC08	MKE-NAV20-08-7-9	7	9	10/7/2020	0.005 U	0.0057 U	0.0026 U	0.0019 U	0.01 U	0.0028 U	0.0029 U	0.0042 U	0.002 U	0.0018 U	**5.1**	**0.12 J+**	**0.12**	**0.037 J**	**0.17**	**0.46 J+**	**0.3**	**0.36 J**	**0.12**	**0.11**	**0.14 J**	**0.3**	0.036 U	**0.59**	**0.12**	**0.21**
MKE-FNC08	MKE-NAV20-08-9-11	9	11	10/7/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	**0.12**	**0.0046 J**	0.0031 U	0.003 U	0.003 U	**0.0078 J**	**

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																						Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100				25															
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300				75															
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500				125															
TSCA																																												
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%
MKE-FNC01	MKE-NAV20-01-0-1	0	1	10/8/2020	0.094 U	**0.48**	**0.69 J+**	**69**	**0.15**	**180**	**26**	**5.1**	**2.1**	**96**	**460**	**0.56**	**86**	**2.4**		**18000**	**330**											**81000 J**									
MKE-FNC01	MKE-NAV20-01-1-3	1	3	10/8/2020	0.072 U	**0.39**	**0.76 J+**	**83**	**0.19**	**180**	**30**	**5.5**	**2.7**	**110**	**500**	**0.87**	**71**	**2.3**		**14000**	**280**											**65000 J**									
MKE-FNC01	MKE-NAV20-01-3-5	3	5	10/8/2020	0.013 U	**0.13**	**0.16**	**52**	**0.096**	**180**	**19**	**3.6**	**1.9**	**37**	**220**	**0.45 J**	**41**	**1.9**		**15000**	**420**											**18000 J**									
MKE-FNC01	MKE-NAV20-01-5-7	5	7	10/8/2020	0.00095 U	**0.0046**	**0.0088**	**14**	0.013 U	**8.7**	**12**	**1.6**	**0.11 J**	**14**	**32**	0.16 U	**21**	**2**		**13000**	**300**											**6600 J**									
MKE-FNC01	MKE-NAV20-01-7-9	7	9	10/8/2020	0.00046 U	**0.00047 J**	**0.0012 J**	**13**	0.017 U	**7.8**	**14**	**2**	0.1 U	**15**	**36**	0.17 U	**21**	**1.7**		**13000**	**290**											**4100 J**									
MKE-FNC01	MKE-NAV20-01-9-11	9	11	10/8/2020	0.00092 U	**0.0011 J**	**0.0022 J**	**17**	0.016 U	**8.7**	**16**	**1.6**	**0.12 J**	**14**	**38**	0.17 U	**30**	**1.8**		**14000**	**290**											**5200**									
MKE-FNC01	MKE-NAV20-01-11-13	11	13	10/8/2020	0.00046 U	0.00046 U	0.00059 U	**15**	0.015 U	**8.7**	**17**	**3.5**	0.099 U	**13**	**35**	0.16 U	**31**	**1.8**		**13000**	**290**											**8400**									
MKE-FNC01	MKE-NAV20-01-13-15	13	15	10/8/2020	0.00046 U	**0.00077 J**	**0.0012 J**	**21**	0.011 U	**10**	**22**	**4.4**	**0.12 J**	**15**	**47**	0.15 U	**37**	**2.1**		**13000**	**300**											**8800**									
MKE-FNC02	MKE-NAV20-02-0-1	0	1	10/8/2020	0.074 U	**0.2 J**	**0.45 J+**	**83**	**0.17**	**160**	**27**	**5.3**	**2.6**	**93**	**400**	**0.51**	**92**	**2.6**		**21000**	**370**											**56000 J**									
MKE-FNC02	MKE-NAV20-02-1-3	1	3	10/8/2020	0.033 U	**0.24**	**0.43 J+**	**100**	**0.32**	**200**	**29**	**7.1**	**3.1**	**93**	**450**	**1.4**	**88**	**2.5**		**20000**	**370**											**59000 J**									
MKE-FNC02	MKE-NAV20-02-3-5	3	5	10/8/2020	**0.13 J**	**0.31 J**	**0.55 J**	**150**	**0.68**	**200**	**24**	**13**	**6.3**	**73**	**400**	**1.1**	**91**	**2.7**		**17000**	**300**											**47000 J**									
MKE-FNC02	MKE-NAV20-02-5-7	5	7	10/8/2020	0.0023 U	**0.0044 J**	**0.007 J**	**14**	0.015 U	**8.3**	**15**	**3**	**0.11 J**	**13**	**39**	0.15 U	**32**	**1.6**		**14000**	**290**											**8000 J**									
MKE-FNC02	MKE-NAV20-02-7-9	7	9	10/8/2020	**0.026 J**	**0.054**	**0.1 J+**	**120**	**0.23**	**45**	**15**	**12**	**0.56**	**24**	**100**	0.17 U	**54**	**1.9**		**16000**	**300**											**22000 J**									
MKE-FNC02	MKE-NAV20-02-9-11	9	11	10/8/2020	0.00092 U	**0.0054**	**0.0069 J+**	**23**	0.017 U	**12**	**17**	**3.6**	**0.16 J**	**14**	**42**	0.17 U	**40**	**2.1**		**16000**	**300**											**8400 J**									
MKE-FNC02	MKE-NAV20-02-11-13	11	13	10/8/2020	**0.0027**	**0.0067**	**0.0062 J+**	**18**	0.017 U	**14**	**16**	**3.2**	**0.19 J**	**13**	**41**	0.16 U	**32**	**1.7**		**14000**	**280**											**8100 J**									
MKE-FNC02	MKE-NAV20-02-13-15	13	15	10/8/2020	**0.0095 J**	**0.016**	**0.031 J+**	**34**	**0.034 J**	**22**	**18**	**4.7**	**0.28**	**17**	**51**	0.17 U	**36**	**1.9**		**15000**	**300**											**12000 J**									
MKE-FNC02	MKE-NAV20-02-15-17	15	17	10/8/2020	**0.001 J**	**0.0024 J**	**0.0033 J+**	**16**	0.015 U	**8.6**	**15**	**3.1**	**0.11 J**	**12**	**37**	0.15 U	**33**	**1.8**		**14000**	**290**											**7800 J**									
MKE-FNC03	MKE-NAV20-03-0-1	0	1	10/8/2020	0.04 U	**0.12 J**	**0.34**	**78**	**0.15**	**130**	**25**	**5.2**	**2.1**	**88**	**400**	**0.39 J**	**82 J**	**2.5**		**19000**	**350**											**57000**									
MKE-FNC03	MKE-NAV20-03-1-3	1	3	10/8/2020	0.072 U	**0.76**	**1.1 J+**	**82**	**0.4**	**180**	**31**	**5.4**	**2.4**	**110**	**480**	**0.99**	**88**	**2.5**		**20000**	**350**											**61000**									
MKE-FNC03	MKE-NAV20-03-3-5	3	5	10/8/2020	0.11 U	**0.53**	**0.88 J+**	**110**	**0.51**	**230**	**22**	**5.1**	**2.6**	**57**	**330**	**0.67**	**59**	**2.4**		**19000**	**420**											**45000**									
MKE-FNC03	MKE-NAV20-03-5-7	5	7	10/8/2020	0.13 U	**0.52**	**0.94 J+**	**150**	**0.31**	**280**	**28**	**5.9**	**4.3**	**90**	**520**	**1.2**	**90**	**2.5**		**26000**	**530**											**54000 J**									
MKE-FNC03	MKE-NAV20-03-7-9	7	9	10/8/2020	0.0046 U	**0.023**	**0.041 J+**	**13**	0.01 U	**10**	**9.5**	**2.4**	**0.2**	**10**	**43**	0.17 U	**25**	**1.5**		**9300**	**260**											**5500 J**									
MKE-FNC03	MKE-NAV20-03-9-11	9	11	10/8/2020	0.0023 U	**0.0077**	**0.013 J+**	**16**	0.015 U	**9.6**	**17**	**3**	**0.18 J**	**13**	**37**	0.16 U	**33**	**1.8**		**14000**	**310**											**9700 J**									
MKE-FNC03	MKE-NAV20-03-11-13	11	13	10/8/2020	0.00091 U	**0.0016 J**	**0.0023 J**	**16**	0.015 U	**8.3**	**17**	**2.9**	**0.097 J**	**13**	**38**	0.16 U	**33**	**1.8**		**14000**	**290**											**7000 J**									
MKE-FNC03	MKE-NAV20-03-13-14.2	13	14.2	10/8/2020	0.00097 U	**0.0011 J**	**0.0014 J**	**18**	0.012 U	**8.4**	**18**	**2.8**	**0.099 J**	**14**	**35**	0.15 U	**38**	**1.9**		**16000**	**290**											**9800 J**									
MKE-FNC04	MKE-NAV20-04-0-1	0	1	10/7/2020	0.00098 U	**0.002 J**	**0.0034 J+**	**17**	0.017 U	**9.8**	**18**	**3.1**	**0.11 J**	**14**	**36**	0.16 U	**38**	**1.9**		**16000**	**310**											**9400**									
MKE-FNC04	MKE-NAV20-04-1-3	1	3	10/7/2020	0.001 U	**0.0032**	**0.0063**	**23**	0.018 U	**11**	**23**	**2.7**	0.097 U	**16**	**39**	0.16 U	**52**	**2.3**		**20000**	**310**											**10000**									
MKE-FNC04	MKE-NAV20-04-3-5	3	5	10/7/2020	**0.0044 J**	**0.019**	**0.039**	**23**	**0.011 J**	**12**	**24**	**2.9**	**0.11 J**	**17**	**40**	0.16 U	**53**	**2.4**		**20000**	**320**											**11000**									
MKE-FNC04	MKE-NAV20-04-5-7	5	7	10/7/2020	0.00049 U	**0.00077 J**	0.00063 U	**30**	0.014 U	**10**	**24**	**2.9**	0.1 U	**16**	**38**	0.16 U	**63**	**2.5**		**22000**	**310**											**9500**									
MKE-FNC04	MKE-NAV20-04-7-9	7	9	10/7/2020	0.0005 U	**0.00085 J**	0.00064 U	**28**	0.011 U	**10**	**24**	**3**	0.1 U	**16**	**38**	0.16 U	**60**	**2.4**		**22000**	**320**											**8400**									
MKE-FNC05	MKE-NAV20-05-0-1	0	1	10/7/2020	0.087 U	**0.088 J**	**0.18 J**	**72**	**0.16**	**150**	**23**	**5.3**	**2**	**77**	**380**	**0.45 J**	**88**	**2.8**		**20000**	**360**											**56000**			**0**	**3.7**	**16.1**	**57.2**	**23**		
MKE-FNC05	MKE-NAV20-05-1-3	1	3	10/7/2020	**0.05 J**	**0.18 J**	**0.36 J**	**79**	**0.23**	**150**	**25**	**4.9**	**2**	**83**	**350**	**0.54**	**84**	**2.5**		**19000**	**330**											**45000**			**0**	**4.1**	**21.3**	**54.5**	**20.1**		
MKE-FNC05	MKE-NAV20-05-3-5	3	5	10/7/2020	0.033 U	**0.22**	**0.47**	**91**	**0.5**	**180**	**28**	**5.3**	**2.8**	**94**	**480**	**0.92**	**110**	**3.9**		**21000**	**350**											**49000**			**0**	**0.8**	**11.3**	**57.8**	**30.1**		
MKE-FNC05	MKE-NAV20-05-5-7	5	7	10/7/2020	0.015 U	**0.39**	**0.44**	**160**	**0.33**	**340**	**29**	**8.6**	**5.5**	**77**	**480**	**1.7**	**93**	**3**		**23000**	**400**											**45000**			**0**	**3**	**8.7**	**57.1**	**31.2**		
MKE-FNC05	MKE-NAV20-05-7-9	7	9	10/7/2020	**0.38**	**0.24**	**0.43**	**520**	**1.2**	**140**	**22**	**8.6**	**2.7**	**72**	**310**	**1.1**	**120**	**3.4**		**23000**	**430**											**57000**			**0**	**5.2**	**10.7**	**56.1**	**28**		
MKE-FNC05	MKE-NAV20-05-9-11	9	11	10/7/2020	**0.044**	**0.05**	**0.091**	**67**	0.017 U	**58**	**18**	**4**	**1.2**	**24**	**110**	**0.27 J**	**70**	**2.5**		**18000**	**490**											**33000**			**0**	**0.6**	**6**	**56.1**	**37.3**		
MKE-FNC05	MKE-NAV20-05-11-13	11	13	10/7/2020	**0.0077 J**	**0.0056 J**	**0.01**	**14**	0.018 U	**10**	**15**	**2.6**	**0.22**	**14**	**52**	0.17 U	**53**	**2.1**		**15000**	**570**											**40000**			**0**	**1.1**	**9.1**	**59.1**	**30.7**		
MKE-FNC05	MKE-NAV20-05-13-15	13	15	10/7/2020	0.0005 U	**0.0024**	**0.004 J+**	**7.5**	0.013 U	**6.5**	**8**	**1.6**	**0.17 J**	**8.6**	**42**	0.15 U	**19**	**1.4**		**8900**	**460**											**12000**			**2**	**6.7**	**33**	**47**	**11.3**		
MKE-FNC06	MKE-NAV20-06-0-1	0	1	10/7/2020	0.17 U	**0.34 J**	**0.62 J+**	**120**	**0.31**	**430**	**28**	**7.5**	**5.3**	**90**	**650**	**1.5**	**85**	**2.8**		**19000**	**420**											**71000**									
MKE-FNC06	MKE-NAV20-06-1-3	1	3	10/7/2020	**0.081 J**	**0.29**	**0.47 J+**	**110**	**0.37**	**320**	**29**	**9.1**	**4.9**	**69**	**380**	**1.7**	**100**	**3.1**		**24000**	**410**											**57000**									
MKE-FNC06	MKE-NAV20-06-3-5	3	5	10/7/2020	**0.69**	**0.3**	**0.48 J+**	**88**	**0.31**	**190**	**24**	**8.3**	**3.9**	**62**	**320**	**0.97**	**85**	**3**		**21000**	**420**											**43000**									
MKE-FNC06	MKE-NAV20-06-5-7	5	7	10/7/2020	**0.0039 J**	**0.0094 J**	**0.015 J+**	**13**	0.022 U	**10**	**14**	**1.7**	**0.2**	**12**	**46**	0.17 U	**52**	**2.1**		**14000**	**490**											**20000**									
MKE-FNC06	MKE-NAV20-06-7-9	7	9	10/7/2020	0.0066 U	0.0066 U	0.0084 U	**19**	0.021 U	**6.6**	**15**	**2.2**	**0.21**	**14**	**52**	0.17 U	**78**	**2.2**		**16000**	**460**											**27000**									
MKE-FNC06	MKE-NAV20-06-9-11	9	11	10/7/2020	0.013 U	0.013 U	0.017 U	**10**	0.024 U	**9.9**	**12**	**2.5**	**0.24**	**12**	**48**	0.17 U	**43**	**1.8**		**12000**	**500**											**40000**									
MKE-FNC06	MKE-NAV20-06-11-13	11	13	10/7/2020	0.0011 U	0.0011 U	0.0014 U	**12**	0.013 U	**7.3**	**10**	**2.3**	**0.17 J**	**11**	**44**	0.16 U	**31**	**1.9**		**11000**	**470**											**17000**									
MKE-FNC06	MKE-NAV20-06-13-15	13	15	10/7/2020	0.0057 U	**0.0074 J**	**0.0099 J**	**13**	0.018 U	**9**	**13**	**2.5**	**0.22**	**14**	**54**	0.17 U	**39**	**2.1**		**13000**	**540**											**26000**									
MKE-FNC06	MKE-NAV20-06-15-16	15	16	10/7/2020	0.005 U	0.005 U	0.0064 U	**6.1**	0.016 U	**4**	**5.6**	**1.4**	0.099 U	**4.7**	**21**	0.16 U	**14**	**1.1**		**6400**	**230**											**11000**									
MKE-FNC07	MKE-NAV20-07-0-1	0	1	10/7/2020	0.035 U	**0.35**	**0.55 J+**	**260**	**0.44**	**720**	**33**	**9.9**	**9.1**	**110**	**1400**	**3.5**	**100**	**2.7**		**25000**	**610**											**74000**									
MKE-FNC07	MKE-NAV20-07-1-3	1	3	10/7/2020	**0.17**	**0.34**	**0.62 J+**	**500**	**0.6**	**530**	**31**	**12**	**8.5**	**94**	**690**	**2.5**	**110**	**2.9**		**25000**	**490**											**85000**									
MKE-FNC07	MKE-NAV20-07-3-5	3	5	10/7/2020	**0.18**	**0.22**	**0.34 J+**	**170**	**0.39**	**290**	**28**	**10**	**6.2**	**71**	**410**	**1.6**	**110**	**2.7**		**24000**	**360**											**55000**									
MKE-FNC07	MKE-NAV20-07-5-7	5	7	10/7/2020	**4.9**	**1.2**	**1.5 J+**	**970**	**1.1**	**220**	**24**	**11**	**4.1**	**81**	**420**	**1.5**	**110**	**3**		**22000**	**320**											**65000**									
MKE-FNC07	MKE-NAV20-07-7-9	7	9	10/7/2020	**0.48**	**0.065**	**0.069 J+**	**27**	**0.065**	**7.3**	**13**	**2.3**	**0.27**	**13**	**53**	0.17 U	**49**	**2**		**13000**	**480**											**29000**									
MKE-FNC07	MKE-NAV20-07-9-11	9	11	10/7/2020	**0.097**	**0.028 J**	**0.04 J**	**13**	0.013 U	**13**	**11**	**2.3**	**0.2**	**11**	**46**	0.17 U	**28**	**1.6**		**10000**	**450**											**17000**									
MKE-FNC07	MKE-NAV20-07-11-13.3	11	13.3	10/7/2020	**0.0041**	**0.0017**	**0.0024 J+**	**12**	0.014 U	**6.9**	**10**	**2.1**	**0.16 J**	**9.7**	**42**	0.16 U	**31**	**1.8**		**11000**	**450**											**17000**									
MKE-FNC08	MKE-NAV20-08-0-1	0	1	10/7/2020	**0.14 J**	0.095 U	**0.18 J**	**73**	**0.17**	**130**	**25**	**5.6**	**1.8**	**89**	**430**	**0.48**	**91**	**2.2**		**21000**	**390**											**62000**									
MKE-FNC08	MKE-NAV20-08-1-3	1	3	10/7/2020	0.069 U	**0.33**	**0.66 J+**	**93**	**0.23**	**200**	**30**	**5.9**	**2.8**	**100**	**490**	**0.92**	**86**	**2.1**		**20000**	**380**											**48000**									
MKE-FNC08	MKE-NAV20-08-3-5	3	5	10/7/2020	**0.033 J**	**0.32**	**0.49 J+**	**260**	**0.42**	**430**	**31**	**8.2**	**6.4**	**110**	**830**	**2.3**	**100**	**2.6**		**23000**	**500**											**57000**									
MKE-FNC08	MKE-NAV20-08-5-7	5	7	10/7/2020	**0.87**	**1.2**	**1.3 J+**	**310**	**1**	**220**	**21**	**11**	**2.7**	**57**	**310**	**0.84**	**110**	**2.7**		**22000**	**340**											**69000**									
MKE-FNC08	MKE-NAV20-08-7-9	7	9	10/7/2020	**0.94**	**0.5**	**0.51 J+**	**96**	**0.2**	**40**	**12**	**3.8**	**0.15 J**	**18**	**68**	0.17 U	**61**	**1.8**		**16000**	**380**											**26000**									
MKE-FNC08	MKE-NAV20-08-9-11	9	11	10/7/2020	**0.018**	**0.01**	**0.013 J+**	**19**	0.02 U	**8.8**	**13**	**2.3**	**0.18 J**	**12**	**48**	0.17 U	**60**	**1.6**		**14000**	**460**											**30000**									
MKE-FNC08	MKE-NAV20-08-11-13	11	13	10/7/2020	**0.024**	**0.013**	**0.014 J+**	**11**	0.014 U	**6.2**	**8.7**	**2.1**	**0.17 J**	**9.1**	**55**	0.17 U	**25**	**1.2**		**10000**	**480**											**15000**									
MKE-FNC09	MKE-NAV20-09-0-1	0	1	10/6/2020	**0.29 J**	**0.23 J**	**0.43 J**	**82**	**0.22**	**150**	**25**	**5.6**	**2.1**	**84**	**410**	**0.64**	**91**	**2.3**		**21000**	**380**											**69000**									
MKE-FNC09	MKE-NAV20-09-1-3	1	3	10/6/2020	**0.23 J**	**0.22 J**	**0.36 J**	**96**	**0.22**	**190**	**29**	**5.6**	**2.6**	**85**	**440**	**0.98**	**88**	**2.2**		**20000**	**380**											**53000**									
MKE-FNC09	MKE-NAV20-09-3-5	3	5	10/6/2020	**0.14 J**	**0.26**	**0.45 J+**	**260**	**0.58**	**480**	**30**	**11**	**6.7**	**78**	**590**	**2.1**	**130 J**	**3**		**25000**	**490**											**79000**									
MKE-FNC09	MKE-NAV20-09-5-7	5	7	10/6/2020	**0.13**	**0.2**	**0.31 J+**	**120**	**0.49**	**260**	**24**	**9.1**	**4.1**	**58**	**310**	**1.5**	**93 J**	**2**		**98000**	**590**											**68000**									
MKE-FNC09	MKE-NAV20-09-7-9	7	9	10/6/2020	**0.15**	**0.27**	**0.39 J+**	**96**	**0.26**	**230**	**27**	**8.3**	**3.8**	**53**	**320**	**1.2**	**110 J**	**2.3**		**23000**	**370**											**53000**									
MKE-FNC09	MKE-NAV20-09-9-11	9	11	10/6/2020	**0.33**	**0.17 J**	**0.23 J+**	**79**	**0.34**	**190**	**22**	**7.3**	**6**	**48**	**320**	**1.1**	**94 J**	**2.7**		**18000**	**350**											**47000**									
MKE-FNC09	MKE-NAV20-09-11-13	11	13	10/6/2020	**0.0054**	**0.01**	**0.015 J+**	**18**	**0.023 J**	**9**	**14**	**1.9**	**0.2**	**12**	**46**	0.15 U	**65 J**	**1.7**		**15000**	**460**											**20000**									
MKE-FNC09	MKE-NAV20-09-13-15	13	15	10/6/2020	**0.0063 J**	**0.0038 J**	0.0041 U	**15**	**0.02 J**	**8.2**	**13**	**2.4**	**0.19**	**13**	**50**	0.17 U	**55 J**	**1.6**		**15000**	**540**											**29000**									
MKE-FNC09	MKE-NAV20-09-15-17	15	17	10/6/2020	**0.0012 J**	**0.0015 J**	0.0015 U	**16**	**0.018 J**	**7.1**	**12**	**2.4**	**0.18 J**	**11**	**47**	0.16 U	**45 J**	**1.5**		**14000**	**550**											**20000**									
MKE-FNC10	MKE-NAV20-10-0-1	0	1	10/6/2020	0.077 U	**0.21 J**	**0.49 J+**	**100**	**0.26**	**180**	**31**	**6.4**	**3.3**	**100**	**540**	**1.1**	**96**	**2.3**		**22000**	**400**											**50000**			**0**	**0.4**	**5.4**	**69.3**	**24.9**		
MKE-FNC10	MKE-NAV20-10-1-3	1	3	10/6/2020	0.074 U	**0.29**	**0.59 J+**	**140**	**0.27**	**210**	**33**	**6.6**	**3.3**	**100**	**500**	**1.1**	**95**	**2.2**		**24000**	**410**											**57000**			**0**	**0.6**	**6.3**	**67.9**	**25.2**		
MKE-FNC10	MKE-NAV20-10-3-5	3	5	10/6/2020	0.034 U	**0.46**	**0.49 J+**	**190**	**0.43**	**360**	**33**	**7.9**	**5.7**	**100**	**640**	**1.7**	**110**	**2.6**		**24000**	**450**											**72000**			**0**	**0.6**	**4.4**	**56.6**	**38.4**		
MKE-FNC10	MKE-NAV20-10-5-7	5	7	10/6/2020	**0.058**	**0.17**	**0.24 J+**	**420**	**0.069**	**320**	**24**	**5.6**	**3.5**	**46**	**350**	**0.98**	**84**	**2.5**		**23000**	**640**											**38000**			**0**	**0.7**	**3.5**	**42.3**	**53.5**		
MKE-FNC10	MKE-NAV20-10-7-9	7	9	10/6/2020	0.0033 U	**0.013**	**0.014 J+**	**22**	**0.028 J**	**10**	**21**	**1.8**	**0.18 J**	**15**	**52**	0.17 U	**69**	**1.9**		**24000**	**630**											**16000**			**0**	**0.1**	**0.1**	**29.1**	**70.7**		
MKE-FNC10	MKE-NAV20-10-9-11	9	11	10/6/2020	**0.00076 J**	**0.0027**	**0.0054 J+**	**27**	**0.031 J**	**12**	**23**	**2.3**	**0.24**	**18**	**65**	0.17 U	**78**	**2.3**		**26000**	**640**											**21000**			**0**	**0.1**	**1.4**	**48.4**	**50.1**		
MKE-FNC10	MKE-NAV20-10-11-13.5	11	13.5	10/6/2020	**0.0045 J**	0.0033 U	0.0042 U	**14**	**0.026 J**	**9.4**	**15**	**2.8**	**0.23**	**14**	**54**	0.16 U	**61**	**1.6**		**17000**	**640**											**29000**			**0**	**0.2**	**3.7**	**62**	**34.1**		
MKE-FNC11	MKE-NAV20-11-0-1	0	1	10/6/2020	0.036 U	**0.079 J**	**0.15**	**110**	**0.3**	**180**	**32**	**6.7**	**3.3**	**110**	**600**	**1.3**	**100**	**2.4**		**25000**	**380**											**57000 J**									
MKE-FNC11	MKE-NAV20-11-1-3	1	3	10/6/2020	**0.2 J+**	**0.39**	**0.5**	**170**	**0.5**	**260**	**27**	**11**	**6**	**66**	**420**	**1.7**	**92**	**2.4**		**21000**	**380**											**58000 J**									
MKE-FNC11	MKE-NAV20-11-3-5	3	5	10/6/2020	**0.19 J**	**0.43 J**	**0.66 J**	**320**	**0.62**	**180**	**21**	**10**	**5**	**62**	**400**	**1.2**	**90**	**2.4**		**19000**	**420**											**54000 J**									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB											PAH													
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8														
WI CBSQG PEC					3										68.4														
WI CBSQG PEC					5										114														
TSCA					50																								
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MKE-FNC11	MKE-NAV20-11-5-7	5	7	10/6/2020	**0.045**	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	**0.045**	0.0051 U	0.0025 U	0.0023 U	**5.3**	**0.12 J+**	**0.12**	0.034 U	**0.12**	**0.36 J+**	**0.24**	**0.56 J**	**0.12**	**0.11 J**	**0.14 J**	**0.31**	0.044 UJ	**0.62**	**0.1 J**	**0.22 J**
MKE-FNC11	MKE-NAV20-11-7-9	7	9	10/6/2020	**0.068**	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.0031 U	0.0033 U	0.0046 U	0.0022 U	**0.068**	**8.2**	0.08 U	**0.08 J**	**0.074 J**	**0.2**	**0.81 J+**	**0.57**	**0.96 J**	**0.26**	**0.29 J**	**0.31 J**	**0.65**	0.08 UJ	**1.3**	**0.094 J**	**0.53 J**
MKE-FNC11	MKE-NAV20-11-9-11	9	11	10/6/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	**0.11**	**0.0019 J**	**0.0021 J**	0.0012 U	**0.0024 J**	**0.0075 J+**	**0.0046**	**0.012 J**	**0.0024 J**	**0.0024 J**	**0.0032 J**	**0.0063**	0.0016 UJ	**0.016**	**0.002 J**	**0.0047 J**
MKE-FNC11	MKE-NAV20-11-11-13	11	13	10/6/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0017 U	0.0013 UJ	0.0017 U	0.0017 UJ	0.0018 UJ	0.0013 U	0.0017 UJ	0.002 U	0.0018 U	0.0017 UJ
MKE-FNC11	MKE-NAV20-11-13-15	13	15	10/6/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0017 U	0.0013 UJ	0.0017 U	0.0017 UJ	0.0018 UJ	0.0013 U	0.0017 UJ	0.002 U	0.0018 U	0.0017 UJ
MKE-FNC11	MKE-NAV20-11-15-17	15	17	10/6/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0048 U	0.0023 U	0.0021 U	0.0024 U	0.0041 U	0.0032 U	0.0031 U	0.0031 U	0.0032 U	0.0041 U	0.0032 UJ	0.0041 U	0.0041 UJ	0.0045 UJ	0.0032 U	0.0041 UJ	0.0048 U	0.0045 U	0.0041 UJ
MKE-FNC12A	MKE-NAV20-12A-0-1	0	1	10/6/2020	**0.047 J**	**0.013 J**	0.004 U	0.0029 U	0.016 U	0.0042 U	0.0044 U	0.0063 U	0.003 U	**0.034**	**1.6**	0.054 U	0.043 U	0.042 U	0.042 U	**0.12 J**	**0.1 J**	**0.22 J**	**0.056 J**	**0.062 J**	**0.063 J**	**0.12 J**	0.054 UJ	**0.27 J+**	0.06 U	**0.095 J**
MKE-FNC12B	MKE-NAV20-12B-0-1	0	1	10/6/2020	**0.047**	0.032 U	0.015 U	0.011 U	0.058 U	0.015 U	0.016 U	0.023 U	0.011 U	**0.047**	**8.5**	**0.12 J**	**0.58**	**0.08 J**	**0.36**	**0.56 J+**	**0.43**	**0.68 J**	**0.19**	**0.18**	**0.25 J**	**0.48**	**0.061 J**	**1.2**	**0.62**	**0.34 J**
MKE-FNC12B	MKE-NAV20-12B-1-3	1	3	10/6/2020	**0.023**	0.0074 U	0.0034 U	0.0025 U	0.013 U	0.0036 U	0.0038 U	0.0054 U	0.0026 U	**0.023**	**1.1**	0.023 U	0.018 U	0.018 U	0.018 U	**0.082 J**	**0.065**	**0.17 J**	**0.035 J**	**0.038 J**	**0.041 J**	**0.079**	0.023 UJ	**0.22**	0.026 U	**0.062 J**
MKE-FNC12B	MKE-NAV20-12B-3-5	3	5	10/6/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.24**	0.0042 U	**0.0082 J**	0.0032 U	**0.0068 J**	**0.019 J**	**0.012**	**0.024 J**	**0.0063 J**	**0.0061 J**	**0.0071 J**	**0.015**	0.0042 UJ	**0.041**	**0.01 J**	**0.0096 J**
MKE-FNC12B	MKE-NAV20-12B-5-7	5	7	10/6/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	**0.053**	0.0041 U	0.0032 U	0.0031 U	0.0031 U	**0.0033 J**	0.0041 U	**0.006 J**	0.0041 U	0.0041 U	0.0045 UJ	**0.0033 J**	0.0041 UJ	**0.0077 J**	0.0045 U	0.0041 UJ
MKE-FNC12B	MKE-NAV20-12B-7-9	7	9	10/6/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.021**	0.0017 U	0.0013 U	0.0013 U	0.0013 U	**0.0013 J**	0.0017 U	**0.0022 J**	0.0017 U	0.0017 U	0.0018 UJ	**0.0014 J**	0.0017 UJ	**0.0027 J**	0.0018 U	0.0017 UJ
MKE-FNC12B	MKE-NAV20-12B-9-11	9	11	10/6/2020	0.0065 U	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0024 U	0.0022 U	0.0026 U	0.0044 U	0.0034 U	0.0034 U	0.0034 U	0.0034 UJ	0.0044 U	0.0034 UJ	0.0044 U	0.0044 U	0.0048 UJ	0.0034 U	0.0044 UJ	0.0052 U	0.0048 U	0.0044 UJ
MKE-FNC12B	MKE-NAV20-12B-11-12.8	11	12.8	10/6/2020	0.0055 U	0.0062 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	0.0023 U	0.0039 U	0.0031 U	0.003 U	0.003 U	0.0031 UJ	0.0039 U	0.0031 UJ	0.0039 U	0.0039 U	0.0043 UJ	0.0031 U	0.0039 UJ	0.0046 U	0.0043 U	0.0039 UJ
MKE-FNC13	MKE-NAV20-13-0-1	0	1	10/5/2020	**0.03**	0.0085 U	0.0039 U	0.0029 U	0.015 U	0.0041 U	0.0044 U	0.0062 U	0.003 U	**0.03**	**1.1**	0.054 U	0.042 U	0.041 U	0.041 U	**0.085 J**	**0.058 J**	**0.16 J**	0.054 U	0.054 U	0.059 UJ	**0.081 J**	0.054 UJ	**0.16**	0.059 U	**0.066 J**
MKE-FNC13	MKE-NAV20-13-1-3	1	3	10/5/2020	**0.095 J+**	0.0078 U	0.0036 U	0.0026 U	0.014 U	0.0038 U	**0.095 J+**	0.0057 U	0.0027 U	0.0025 U	**1.8**	0.049 U	0.039 U	0.038 U	0.038 U	**0.15 J**	**0.11 J**	**0.27 J**	**0.058 J**	**0.07 J**	**0.079 J**	**0.16**	0.049 UJ	**0.28**	0.054 U	**0.13 J**
MKE-FNC13	MKE-NAV20-13-3-5	3	5	10/5/2020	**0.058**	0.0074 U	0.0034 U	0.0025 U	0.013 U	0.0036 U	0.0038 U	0.0054 U	0.0026 U	**0.058**	**13.5**	0.093 U	0.073 U	**0.093 J**	**0.39 J**	**1.5 J**	**0.84 J**	**1.3 J**	**0.37 J**	**0.31 J**	**0.43 J**	**1.3 J**	**0.13 J**	**2.9 J**	0.1 U	**0.61 J**
MKE-FNC13	MKE-NAV20-13-5-7	5	7	10/5/2020	**0.02**	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	**0.02**	0.0049 U	0.0024 U	0.0022 U	**0.86**	0.021 U	0.017 U	0.016 U	**0.018 J**	**0.078 J**	**0.047 J**	**0.1 J**	**0.025 J**	**0.023 J**	**0.029 J**	**0.067**	0.021 UJ	**0.16**	0.023 U	**0.04 J**
MKE-FNC13	MKE-NAV20-13-7-9	7	9	10/5/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.077**	0.0042 U	0.0033 U	0.0032 U	0.0032 U	**0.0062 J**	**0.0053 J**	**0.011 J**	0.0042 U	0.0042 U	0.0046 UJ	**0.006 J**	0.0042 UJ	**0.0095 J**	0.0046 U	**0.0059 J**
MKE-FNC13	MKE-NAV20-13-9-11	9	11	10/5/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0046 U	0.0022 U	0.002 U	0.00095 U	0.0016 U	0.0013 U	0.0012 U	0.0012 U	0.0013 UJ	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 UJ	0.0013 U	0.0016 UJ	0.0019 U	0.0018 U	0.0016 UJ
MKE-FNC13	MKE-NAV20-13-11-13	11	13	10/5/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0022 U	0.0021 U	0.00095 U	0.0016 U	0.0013 U	0.0012 U	0.0012 U	0.0013 UJ	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 UJ	0.0013 U	0.0016 UJ	0.0019 U	0.0018 U	0.0016 UJ
MKE-FNC14B	MKE-NAV20-14B-0-1	0	1	10/5/2020	0.0085 U	0.0093 U	0.0042 U	0.0031 U	0.017 U	0.0045 U	0.0048 U	0.0067 U	0.0032 U	0.003 U	**1.6**	0.029 U	0.023 U	0.022 U	0.022 U	**0.12 J**	**0.11 J+**	**0.28 J**	**0.053 J**	**0.065 J**	**0.067 J**	**0.11**	0.029 UJ	**0.25**	0.032 U	**0.11 J+**
MKE-FNC14B	MKE-NAV20-14B-1-3	1	3	10/5/2020	0.007 U	0.0079 U	0.0036 U	0.0027 U	0.014 U	0.0038 U	0.0041 U	0.0058 U	0.0028 U	0.0025 U	**0.84**	0.01 U	0.0079 U	**0.0078 J**	**0.013 J**	**0.08 J**	**0.069 J+**	**0.11 J**	**0.03**	**0.037 J+**	**0.041 J**	**0.067**	0.01 UJ	**0.13**	0.011 U	**0.068 J+**
MKE-FNC14B	MKE-NAV20-14B-3-5	3	5	10/5/2020	**0.03**	0.0072 U	0.0033 U	0.0024 U	0.013 U	0.0035 U	0.0037 U	0.0053 U	0.0025 U	**0.03**	**1.7**	0.023 U	0.018 U	0.017 U	**0.028 J**	**0.17 J**	**0.12 J+**	**0.28 J**	**0.05 J**	**0.054 J**	**0.073 J**	**0.13**	0.023 UJ	**0.23**	0.025 U	**0.1 J+**
MKE-FNC14B	MKE-NAV20-14B-5-7	5	7	10/5/2020	0.007 U	0.0079 U	0.0036 U	0.0027 U	0.014 U	0.0038 U	0.004 U	0.0057 U	0.0028 U	0.0025 U	**1.8**	0.025 U	0.019 U	0.019 U	**0.035 J**	**0.19 J**	**0.15 J+**	**0.23 J**	**0.065**	**0.072 J+**	**0.077 J**	**0.16**	0.025 UJ	**0.27**	0.027 U	**0.13 J+**
MKE-FNC14B	MKE-NAV20-14B-7-9	7	9	10/5/2020	0.0065 U	0.0069 U	0.0032 U	0.0023 U	0.013 U	0.0033 U	0.0036 U	0.005 U	0.0024 U	0.0022 U	**0.15**	0.0017 U	0.0014 U	0.0013 U	**0.0025 J**	**0.013 J**	**0.0097 J+**	**0.023 J**	**0.0042 J**	**0.0048 J+**	**0.0061 J**	**0.01**	0.0017 UJ	**0.027**	0.0019 U	**0.0091 J+**
MKE-FNC14B	MKE-NAV20-14B-9-11	9	11	10/5/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.019**	0.00082 U	0.00065 U	0.00063 U	**0.0022 J**	0.00082 U	**0.0041 J**	0.00082 U	0.00082 U	0.0009 UJ	0.00065 U	0.00082 UJ	**0.0039 J+**	0.0009 U	0.00082 U
MKE-FNC14B	MKE-NAV20-14B-11-12.7	11	12.7	10/5/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	0.00095 U	0.0016 U	0.0012 U	0.0012 U	0.0012 U	0.0012 UJ	0.0016 U	0.0012 UJ	0.0016 U	0.0016 U	0.0017 UJ	0.0012 U	0.0016 UJ	0.0019 U	0.0017 U	0.0016 U
MKE-FNC15	MKE-NAV20-15-0-1	0	1	10/2/2020	0.007 U	0.008 U	0.0036 U	0.0027 U	0.014 U	0.0038 U	0.0041 U	0.0058 U	0.0028 U	0.0026 U	**6.3**	0.05 U	0.039 U	**0.078 J**	**0.14**	**0.64 J**	**0.46**	**0.72 J**	**0.2**	**0.17**	**0.24 J+**	**0.53**	**0.06 J**	**1.1**	**0.059 J**	**0.33 J**
MKE-FNC15	MKE-NAV20-15-1-3	1	3	10/2/2020	0.007 U	0.008 U	0.0036 U	0.0027 U	0.014 U	0.0038 U	0.0041 U	0.0058 U	0.0028 U	0.0026 U	**2.8**	0.05 U	0.039 U	0.038 UJ	**0.047 J**	**0.24 J**	**0.2 J**	**0.46 J**	**0.1 J**	**0.099 J**	**0.12 J**	**0.22 J**	0.05 UJ	**0.44 J**	0.055 U	**0.17 J**
MKE-FNC15	MKE-NAV20-15-3-5	3	5	10/2/2020	**0.1 J**	**0.021 J**	0.0073 U	0.0054 U	0.029 U	0.0077 U	0.0082 U	0.012 U	0.0056 U	**0.079**	**2.1**	0.025 U	0.02 U	**0.019 J**	**0.034 J**	**0.19 J+**	**0.15 J+**	**0.32 J**	**0.071**	**0.068**	**0.085 J+**	**0.16**	0.025 UJ	**0.34 J+**	0.027 U	**0.13 J**
MKE-FNC15	MKE-NAV20-15-5-7	5	7	10/2/2020	**0.089 J+**	**0.011 J**	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	**0.078 J+**	**6.3**	0.089 U	0.07 U	0.068 U	**0.21 J**	**0.66 J**	**0.4**	**0.78 J**	**0.18 J**	**0.17 J**	**0.22 J**	**0.48**	0.089 UJ	**1.2**	0.098 U	**0.33 J**
MKE-FNC15	MKE-NAV20-15-7-9	7	9	10/2/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.031**	0.0017 U	0.0013 U	0.0013 U	0.0013 U	**0.0027 J**	**0.002 J**	**0.0047 J**	0.0017 U	0.0017 U	0.0018 UJ	**0.0024 J**	0.0017 UJ	**0.0044**	0.0018 U	**0.0019 J**
MKE-FNC15	MKE-NAV20-15-9-11.5	9	11.5	10/2/2020	0.0055 U	0.0061 U	0.0028 U	0.0021 U	0.011 U	0.0029 U	0.0031 U	0.0044 U	0.0021 U	0.0019 U	**0.1**	0.0038 U	0.003 U	0.0029 U	**0.0034 J**	**0.011 J**	**0.0062 J**	**0.012 J**	0.0038 U	0.0038 U	0.0042 UJ	**0.0083 J**	0.0038 UJ	**0.018**	0.0042 U	**0.0052 J**
MKE-FNC15	MKE-NAV20-15-11-11.5	11	11.5	10/2/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	0.0046 U	0.0078 U	0.0061 U	0.006 U	0.006 U	0.0061 U	0.0078 U	0.0061 UJ	0.0078 U	0.0078 U	0.0086 U	0.0061 U	0.0078 UJ	0.0092 U	0.0086 U	0.0078 UJ
MKE-FNC16	MKE-NAV20-16-0-01	0	1	10/5/2020	0.0065 U	0.0071 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	0.0023 U	**0.1**	0.0018 U	0.0014 U	0.0014 U	**0.0014 J**	**0.0099 J**	**0.0081 J+**	**0.022 J**	**0.0035 J**	**0.0047 J+**	**0.0045 J**	**0.0073**	0.0018 UJ	**0.013**	0.002 U	**0.0089 J+**
MKE-FNC16	MKE-NAV20-16-00-01	0	1	10/5/2020	0.0065 U	0.0071 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	0.0023 U	**0.1**	0.0018 U	0.0014 U	0.0014 U	**0.0014 J**	**0.0099 J**	**0.0081 J+**	**0.022 J**	**0.0035 J**	**0.0047 J+**	**0.0045 J**	**0.0073**	0.0018 UJ	**0.013**	0.002 U	**0.0089 J+**
MKE-FNC16	MKE-NAV20-16-01-03	1	3	10/5/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.018**	0.00085 U	0.00067 U	0.00065 U	0.00065 U	0.00067 UJ	0.00085 U	**0.0038 J**	0.00085 U	0.00085 U	0.00093 UJ	**0.0015 J**	0.00085 UJ	**0.0033 J+**	0.00093 U	0.00085 U
MKE-FNC16	MKE-NAV20-16-3-5	3	5	10/5/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.00049 U	0.00083 U	0.00065 U	0.00064 U	0.00064 U	0.00065 UJ	0.00083 U	0.00065 UJ	0.00083 U	0.00083 U	0.00092 UJ	0.00065 U	0.00083 UJ	0.00098 U	0.00092 U	0.00083 U
MKE-FNC16	MKE-NAV20-16-5-7	5	7	10/5/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	**0.011**	0.00081 U	0.00064 U	0.00062 U	0.00062 U	0.00064 UJ	0.00081 U	0.00064 UJ	0.00081 U	0.00081 U	0.00089 UJ	**0.001 J**	0.00081 UJ	**0.0021 J+**	0.00089 U	0.00081 U
MKE-FNC16	MKE-NAV20-16-7-9	7	9	10/5/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0033 U	0.0046 U	0.0022 U	0.002 U	**0.015**	0.0016 U	0.0013 U	**0.0017 J**	0.0012 U	0.0013 UJ	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 UJ	0.0013 U	0.0016 UJ	0.0019 U	0.0018 U	0.0016 U
MKE-FNC17	MKE-NAV20-17-0-1	0	1	10/2/2020	**0.074 J**	**0.014 J**	0.0039 U	0.0029 U	0.016 U	0.0041 U	0.0044 U	0.0063 U	0.003 U	**0.06**	**1.7**	0.054 U	0.042 U	0.041 UJ	0.041 UJ	**0.14 J+**	**0.12 J**	**0.26 J**	**0.069 J**	**0.073 J**	**0.073 J**	**0.15**	0.054 UJ	**0.26 J+**	0.059 U	**0.12 J**
MKE-FNC17	MKE-NAV20-17-1-3	1	3	10/2/2020	**0.033 J**	**0.0081 J**	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	**0.025**	**0.34**	0.0088 U	0.0069 U	0.0067 UJ	**0.0075 J**	**0.031 J+**	**0.022 J+**	**0.047 J**	**0.012 J**	**0.011 J**	**0.015 J**	**0.029**	0.0088 UJ	**0.053 J+**	0.0097 U	**0.021 J**
MKE-FNC17	MKE-NAV20-17-3-5	3	5	10/2/2020	0.006 U	0.0067 U	0.003 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	0.0025 U	0.0042 U	0.0033 U	0.0032 UJ	0.0032 U	0.0033 U	0.0042 U	0.0033 UJ	0.0042 U	0.0042 U	0.0046 U	0.0033 U	0.0042 UJ	0.005 U	0.0046 U	0.0042 UJ
MKE-FNC17	MKE-NAV20-17-5-7	5	7	10/2/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	0.00095 U	0.0016 U	0.0013 U	0.0013 UJ	0.0013 U	0.0013 U	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 U	0.0013 U	0.0016 UJ	0.0019 U	0.0018 U	0.0016 UJ
MKE-FNC17	MKE-NAV20-17-7-9	7	9	10/2/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	0.0009 U	0.0016 U	0.0012 U	0.0012 UJ	0.0012 U	0.0012 U	0.0016 U	0.0012 UJ	0.0016 U	0.0016 U	0.0017 U	0.0012 U	0.0016 UJ	0.0018 U	0.0017 U	0.0016 UJ
MKE-FNC17	MKE-NAV20-17-9-11	9	11	10/2/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	0.0009 U	0.0016 U	0.0012 U	0.0012 UJ	0.0012 U	0.0012 U	0.0016 U	0.0012 UJ	0.0016 U	0.0016 U	0.0017 U	0.0012 U	0.0016 UJ	0.0018 U	0.0017 U	0.0016 UJ
MKE-FNC17	MKE-NAV20-17-11-11.5	11	11.5	10/2/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	0.0046 U	0.0078 U	0.0061 U	0.006 U	0.006 U	0.0061 U	0.0078 U	0.0061 UJ	0.0078 U	0.0078 U	0.0086 U	0.0061 U	0.0078 UJ	0.0092 U	0.0086 U	0.0078 UJ
MKE-FNC18	MKE-NAV20-18-0-1	0	1	9/30/2020	**0.053 J**	**0.014 J**	0.0039 U	0.0029 U	0.016 U	0.0042 U	0.0044 U	0.0063 U	0.003 U	**0.039**	**1.7**	0.011 U	0.0085 U	**0.016 J**	**0.029**	**0.13 J+**	**0.12**	**0.24 J**	**0.038**	**0.055 J-**	**0.22 J**	**0.096**	**0.013 J**	**0.29**	**0.015 J**	**0.097**
MKE-FNC18	MKE-NAV20-18-1-3	1	3	9/30/2020	**0.025**	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0035 U	0.0049 U	0.0024 U	**0.025**	**1.2**	**0.007 J**	**0.02**	**0.016**	**0.042 J**	**0.12 J**	**0.058 J**	**0.13 J**	**0.025 J**	**0.03 J**	**0.04 J**	**0.089 J**	**0.01 J**	**0.22**	**0.037**	**0.049 J**
MKE-FNC18	MKE-NAV20-18-3-5	3	5	9/30/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	**0.037**	0.0008 U	0.00062 U	0.00061 U	**0.0012 J**	**0.0037 J+**	**0.0022**	**0.005 J**	**0.00082 J**	**0.001 J**	**0.0013 J**	**0.0025**	0.0008 UJ	**0.0063**	0.00087 U	**0.0019 J**
MKE-FNC18	MKE-NAV20-18-5-7	5	7	9/30/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0046 U	0.0022 U	0.002 U	**0.035**	0.0016 U	0.0013 U	0.0012 U	**0.0012 J**	**0.0037 J**	**0.002 J**	**0.005 J**	0.0016 U	0.0016 U	0.0018 UJ	**0.0027 J**	0.0016 UJ	**0.005 J**	0.0018 U	**0.002 J**
MKE-FNC18	MKE-NAV20-18-7-9	7	9	9/30/2020	0.005 U	0.0056 U	0.0026 U	0.0019 U	0.01 U	0.0027 U	0.0029 U	0.0041 U	0.002 U	0.0018 U	0.00085 U	0.0014 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0014 U	0.0011 UJ	0.0014 U	0.0014 U	0.0016 UJ	0.0011 U	0.0014 UJ	0.0017 U	0.0016 U	0.0014 U
MKE-FNC19	MKE-NAV20-19-0-1	0	1	9/30/2020	**0.039 J+**	0.0076 U	**0.039 J+**	0.0026 U	0.014 U	0.0037 U	0.0039 U	0.0056 U	0.0027 U	0.0024 U	**2.9**	0.019 U	0.015 U	**0.026 J**	**0.047 J**	**0.28 J**	**0.21 J**	**0.38 J**	**0.057**	**0.076 J-**	**0.35 J**	**0.23**	**0.02 J**	**0.47**	**0.028 J**	**0.15**
MKE-FNC19	MKE-NAV20-19-1-3	1	3	9/30/2020	**0.0081 J+**	**0.0081 J**	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	**0.08**	0.0017 U	**0.0017 J**	0.0013 U	**0.0022 J**	**0.007 J+**	**0.0049**	**0.011 J**	**0.0021 J**	**0.0029 J**	**0.0032 J**	**0.0056**	0.0017 UJ	**0.012**	0.0019 U	**0.0049**
MKE-FNC19	MKE-NAV20-19-3-5	3	5	9/30/2020	0.006 U	0.0069 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	0.0005 U	0.00086 U	0.00068 U	0.00066 U	0.00066 U	0.00068 U	0.00086 U	0.00068 UJ	0.00086 U	0.00086 U	0.00095 UJ	0.00068 U	0.00086 UJ	0.001 U	0.00095 U	0.00086 U
MKE-FNC19	MKE-NAV20-19-5-7	5	7	9/30/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0018 UJ	0.0013 U	0.0017 UJ	0.002 U	0.0018 U	0.0017 U
MKE-FNC19	MKE-NAV20-19-7-9	7	9	9/30/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.00049 U	0.00082 U	0.00065 U	0.00063 U	0.00063 U	0.00065 U	0.00082 U	0.00065 UJ	0.00082 U	0.00082 U	0.0009 UJ	0.00065 U	0.00082 UJ	0.00097 U	0.0009 U	0.00082 U
MKE-FNC20	MKE-NAV20-20-0-1	0	1	10/2/2020	**0.046**	0.0084 U	0.0038 U	0.0028 U	0.015 U	0.0041 U	0.0043 U	0.0061 U	0.0029 U	**0.046**	**1.1**	0.027 U	0.021 U	0.02 UJ

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

										Metals																														Physical Parameters									
Analyte Group								Metals																																									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460				40000	1100				25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380				120000	3300				75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300				200000	5500				125																
TSCA																																															
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
MKE-FNC11	MKE-NAV20-11-5-7	5	7	10/6/2020	**1.2** J+	**0.43**	**0.47**	**330**	**0.51**	**450**	**29**	**12**	**12**	**83**	**700**	**2.1**	**110**	**2.8**		**22000**	**420**											**67000** J									
MKE-FNC11	MKE-NAV20-11-7-9	7	9	10/6/2020	**0.42** J+	**0.62**	**0.98**	**30**	**0.27**	**59**	**14**	**3.1**	**1.4**	**21**	**110**	**0.28** J	**68**	**1.6**		**15000**	**480**											**41000** J									
MKE-FNC11	MKE-NAV20-11-9-11	9	11	10/6/2020	**0.018** J+	**0.0082**	**0.012**	**22**	**0.031** J	**10**	**19**	**2.1**	**0.18**	**15**	**46**	0.15 U	**59**	**1.9**		**19000**	**550**											**16000** J									
MKE-FNC11	MKE-NAV20-11-11-13	11	13	10/6/2020	0.0013 U	0.0013 U	0.0017 U	**21**	**0.029** J	**9.7**	**20**	**1.6**	**0.18** J	**14**	**49**	0.17 U	**73**	**2**		**23000**	**670**											**17000** J									
MKE-FNC11	MKE-NAV20-11-13-15	13	15	10/6/2020	0.0013 U	0.0013 U	0.0017 U	**33**	**0.028** J	**12**	**23**	**1.9**	**0.24**	**16**	**62**	0.16 U	**91**	**2.3**		**27000**	**630**											**18000** J									
MKE-FNC11	MKE-NAV20-11-15-17	15	17	10/6/2020	0.0032 U	0.0032 U	0.0041 U	**19**	**0.026** J	**9.6**	**16**	**2.7**	**0.22**	**14**	**56**	0.15 U	**66**	**1.7**		**18000**	**600**											**28000** J									
MKE-FNC12A	MKE-NAV20-12A-0-1	0	1	10/6/2020	0.043 U	**0.11** J	**0.21** J+	**280**	**0.41**	**360**	**33**	**10**	**12**	**100**	**670**	**2**	**100**	**2.7**		**27000**	**480**											**71000** J									
MKE-FNC12B	MKE-NAV20-12B-0-1	0	1	10/6/2020	**0.13** J+	**1.4**	**0.86**	**230**	**0.61**	**340**	**33**	**9.3**	**7**	**100**	**610**	**1.9**	**110**	**2.8**		**30000**	**440**											**73000** J									
MKE-FNC12B	MKE-NAV20-12B-1-3	1	3	10/6/2020	0.018 U	**0.093**	**0.16**	**180**	**0.22**	**270**	**25**	**6.1**	**4.2**	**60**	**410**	**1.1**	**95**	**2.4**		**25000**	**570**											**48000** J									
MKE-FNC12B	MKE-NAV20-12B-3-5	3	5	10/6/2020	0.0033 U	**0.033**	**0.03**	**32**	**0.032** J	**30**	**17**	**1.9**	**0.44**	**15**	**68**	0.17 U	**83**	**2**		**21000**	**620**											**17000** J									
MKE-FNC12B	MKE-NAV20-12B-5-7	5	7	10/6/2020	0.0032 U	**0.0036** J	**0.0059** J	**21**	**0.028** J	**11**	**19**	**1.7**	**0.16** J	**14**	**44**	0.16 U	**62**	**1.9**		**22000**	**510**											**14000** J									
MKE-FNC12B	MKE-NAV20-12B-7-9	7	9	10/6/2020	0.0013 U	**0.002** J	**0.002** J	**21**	**0.026** J	**10**	**20**	**1.7**	**0.18** J	**15**	**47**	0.17 U	**63**	**1.9**		**22000**	**590**											**15000** J									
MKE-FNC12B	MKE-NAV20-12B-9-11	9	11	10/6/2020	0.0034 U	0.0034 U	0.0044 U	**19**	**0.027** J	**9.7**	**19**	**2**	**0.2**	**15**	**53**	0.17 U	**76**	**1.8**		**22000**	**640**											**26000** J									
MKE-FNC12B	MKE-NAV20-12B-11-12.8	11	12.8	10/6/2020	0.0031 U	0.0031 U	0.0039 U	**12**	**0.021** J	**8.9**	**14**	**2.8**	**0.21**	**14**	**55**	0.17 U	**51**	**1.5**		**15000**	**590**											**23000** J									
MKE-FNC13	MKE-NAV20-13-0-1	0	1	10/5/2020	0.042 U	**0.061** J	**0.13** J	**240**	**0.41**	**190**	**29**	**8.5**	**4.9**	**95**	**520**	**1.6**	**100**	**2.5**		**26000**	**430**											**58000** J									
MKE-FNC13	MKE-NAV20-13-1-3	1	3	10/5/2020	**0.057** J	**0.1** J	**0.23** J+	**370**	**0.53**	**340**	**33**	**11**	**8.1**	**94**	**630**	**2.3**	**110**	**2.8**		**28000**	**510**											**57000** J									
MKE-FNC13	MKE-NAV20-13-3-5	3	5	10/5/2020	0.073 UJ	**1.2** J	**2** J	**330**	**0.52**	**300**	**27**	**9.1**	**7.1**	**68**	**470**	**1.8**	**100**	**2.4**		**23000**	**550**											**53000** J									
MKE-FNC13	MKE-NAV20-13-5-7	5	7	10/5/2020	**0.034** J	**0.069**	**0.12** J+	**36**	**0.062**	**40**	**16**	**2.5**	**0.82**	**16**	**78**	**0.18** J	**81**	**1.8**		**20000**	**670**											**27000** J									
MKE-FNC13	MKE-NAV20-13-7-9	7	9	10/5/2020	0.0033 U	**0.0066** J	**0.0072** J	**24**	**0.024** J	**15**	**17**	**1.8**	**0.36**	**13**	**50**	0.17 U	**63**	**1.7**		**20000**	**530**											**19000** J									
MKE-FNC13	MKE-NAV20-13-9-11	9	11	10/5/2020	0.0013 U	0.0013 U	0.0016 U	**21**	**0.017** J	**8.7**	**19**	**1.6**	**0.18** J	**14**	**47**	0.17 U	**67**	**1.9**		**23000**	**640**											**18000** J									
MKE-FNC13	MKE-NAV20-13-11-13	11	13	10/5/2020	0.0013 U	0.0013 U	0.0016 U	**21**	0.022 U	**10**	**21**	**1.9**	**0.21**	**15**	**58**	0.16 U	**74**	**1.9**		**26000**	**660**											**14000** J									
MKE-FNC14B	MKE-NAV20-14B-0-1	0	1	10/5/2020	**0.028** J	**0.072** J	**0.21** J+	**120**	**0.37**	**120**	**22**	**6.6**	**3**	**72**	**360**	**0.69**	**88**	**2.3**		**22000**	**470**											**58000** J									
MKE-FNC14B	MKE-NAV20-14B-1-3	1	3	10/5/2020	**0.019** J	**0.038**	**0.11** J+	**150**	**0.36**	**150**	**22**	**6.8**	**3.5**	**72**	**340**	**0.88**	**96**	**2.3**		**22000**	**450**											**55000** J									
MKE-FNC14B	MKE-NAV20-14B-3-5	3	5	10/5/2020	**0.022** J	**0.096**	**0.26** J+	**220**	**0.51**	**190**	**27**	**7.7**	**4.5**	**75**	**400**	**1.2**	**100**	**2.7**		**23000**	**450**											**49000** J									
MKE-FNC14B	MKE-NAV20-14B-5-7	5	7	10/5/2020	**0.024** J	**0.11**	**0.27** J+	**410**	**0.51**	**440**	**35**	**12**	**9**	**96**	**640**	**2.5**	**120**	**3.1**		**29000**	**540**											**57000** J									
MKE-FNC14B	MKE-NAV20-14B-7-9	7	9	10/5/2020	**0.0039** J	**0.0098**	**0.021** J+	**45**	**0.074**	**39**	**16**	**2**	**0.82**	**17**	**82**	**0.19** J	**85**	**1.7**		**19000**	**670**											**28000** J									
MKE-FNC14B	MKE-NAV20-14B-9-11	9	11	10/5/2020	0.00065 U	**0.0013** J	**0.003** J+	**19**	0.023 U	**8.7**	**19**	**1.6**	**0.16** J	**14**	**43**	0.16 U	**64**	**1.9**		**21000**	**510**											**18000** J									
MKE-FNC14B	MKE-NAV20-14B-11-12.7	11	12.7	10/5/2020	0.0012 U	0.0012 U	0.0016 U	**26**	0.023 U	**10**	**22**	**1.7**	**0.18** J	**15**	**52**	0.17 U	**72**	**2.1**		**26000**	**640**											**17000** J									
MKE-FNC15	MKE-NAV20-15-0-1	0	1	10/2/2020	**0.091** J	**0.52**	**0.88**	**92**	**0.39**	**97**	**16**	**5**	**2.1**	**51**	**250**	**0.52**	**82**	**1.6**		**15000**	**370**											**45000** J			**0.1**	**2.7**	**15.3**	**54.4**	**27.5**		
MKE-FNC15	MKE-NAV20-15-1-3	1	3	10/2/2020	**0.092** J	**0.16** J	**0.36** J	**160**	**0.53**	**140**	**22**	**7.8**	**3.9**	**72**	**350**	**0.93**	**95**	**2.4**		**23000**	**460**											**54000** J			**0.2**	**2.4**	**14.7**	**50.8**	**31.9**		
MKE-FNC15	MKE-NAV20-15-3-5	3	5	10/2/2020	**0.038** J	**0.12**	**0.29** J+	**430**	**0.63**	**340**	**34**	**12**	**9.7**	**99**	**630**	**2.6**	**130**	**3**		**31000**	**530**											**61000** J			**0**	**0.3**	**6.3**	**59.1**	**34.3**		
MKE-FNC15	MKE-NAV20-15-5-7	5	7	10/2/2020	**0.11** J	**0.47**	**0.85**	**410**	**1.1**	**240**	**29**	**19**	**9.4**	**100**	**560**	**2.5**	**130**	**3.5**		**25000**	**420**											**64000** J			**0.2**	**1.6**	**11.9**	**48.2**	**38.1**		
MKE-FNC15	MKE-NAV20-15-7-9	7	9	10/2/2020	0.0013 U	**0.0018** J	**0.0035** J	**26**	**0.026** J	**9.7**	**19**	**1.7**	**0.2**	**13**	**49**	0.17 U	**88**	**2**		**24000**	**590**											**20000** J			**0**	**0.1**	**0.5**	**34.7**	**64.7**		
MKE-FNC15	MKE-NAV20-15-9-11.5	9	11.5	10/2/2020	0.003 U	**0.0074** J	**0.013**	**26**	**0.024** J	**9.5**	**21**	**2**	**0.15** J	**15**	**46**	0.17 U	**72**	**2**		**26000**	**480**											**20000** J			**0**	**0.1**	**0.5**	**30.1**	**69.3**		
MKE-FNC16	MKE-NAV20-16-00-01	0	1	10/5/2020	**0.0021** J	**0.0032** J	**0.012** J+	**77**	0.027 U	**16**	**59**	**6.9**	**0.33**	**170**	**200**	**0.19** J	**80**	**1.9**		**38000**	**830**											**31000** J									
MKE-FNC16	MKE-NAV20-16-01-03	1	3	10/5/2020	0.00067 U	**0.0011** J	**0.0028** J+	**15**	0.024 U	**8.4**	**16**	**1.4**	**0.25**	**14**	**50**	0.17 U	**79**	**1.6**		**17000**	**740**											**27000** J									
MKE-FNC16	MKE-NAV20-16-3-5	3	5	10/5/2020	0.00065 U	0.00065 U	0.00083 U	**18**	0.017 U	**7.9**	**17**	**1.6**	**0.23**	**13**	**49**	0.17 U	**83**	**1.9**		**22000**	**750**											**27000** J									
MKE-FNC16	MKE-NAV20-16-5-7	5	7	10/5/2020	0.00064 U	**0.00072** J	**0.0024** J+	**17**	0.022 U	**7.6**	**16**	**1.3**	**0.21**	**11**	**47**	0.17 U	**88**	**1.7**		**21000**	**660**											**28000** J									
MKE-FNC16	MKE-NAV20-16-7-9	7	9	10/5/2020	0.0013 U	0.0013 U	0.0016 U	**26**	0.021 U	**8.7**	**19**	**1.7**	**0.18** J	**13**	**46**	0.17 U	**86**	**1.9**		**23000**	**550**											**20000** J									
MKE-FNC17	MKE-NAV20-17-0-1	0	1	10/2/2020	**0.043** J	**0.08** J	**0.21** J+	**160**	**0.46**	**130**	**21**	**7.2**	**3.9**	**100**	**360**	**1**	**91**	**2.3**		**22000**	**500**											**64000** J									
MKE-FNC17	MKE-NAV20-17-1-3	1	3	10/2/2020	**0.0073** J	**0.02** J	**0.041** J+	**62**	**0.12**	**51**	**18**	**3.1**	**1.3**	**23**	**100**	**0.36** J	**90**	**2.1**		**23000**	**720**											**36000** J									
MKE-FNC17	MKE-NAV20-17-3-5	3	5	10/2/2020	0.0033 U	0.0033 U	0.0042 U	**15**	0.02 U	**7.4**	**15**	**1.6**	**0.23**	**12**	**46**	0.17 U	**86**	**1.6**		**20000**	**760**											**30000** J									
MKE-FNC17	MKE-NAV20-17-5-7	5	7	10/2/2020	0.0013 U	0.0013 U	0.0016 U	**15**	0.018 U	**7.3**	**15**	**1.3**	**0.19**	**11**	**43**	0.17 U	**81**	**1.6**		**19000**	**670**											**24000** J									
MKE-FNC17	MKE-NAV20-17-7-9	7	9	10/2/2020	0.0012 U	0.0012 U	0.0016 U	**22**	0.02 U	**8.9**	**19**	**1.7**	**0.15** J	**14**	**44**	0.17 U	**65**	**1.8**		**23000**	**530**											**15000** J									
MKE-FNC17	MKE-NAV20-17-9-11	9	11	10/2/2020	0.0012 U	0.0012 U	0.0016 U	**17**	0.023 U	**8.4**	**18**	**1.6**	**0.15** J	**14**	**42**	0.17 U	**60**	**1.7**		**19000**	**510**											**17000** J									
MKE-FNC17	MKE-NAV20-17-11-11.5	11	11.5	10/2/2020	0.0061 U	0.0061 U	0.0078 U	**25**	0.018 U	**9.5**	**21**	**1.8**	**0.16** J	**15**	**48**	0.17 U	**71**	**2.1**		**25000**	**570**											**18000** J									
MKE-FNC18	MKE-NAV20-18-0-1	0	1	9/30/2020	**0.029**	**0.074**	**0.23**	**400**	**0.55**	**190**	**28**	**8.4**	**5.3**	**88**	**430**	**1.6**	**100**	**2.9**		**25000**	**460**											**67000**									
MKE-FNC18	MKE-NAV20-18-1-3	1	3	9/30/2020	**0.015**	**0.15**	**0.17**	**120**	**0.21**	**110**	**23**	**3.8**	**2.3**	**32**	**150**	**0.61**	**80**	**2.5**		**25000**	**620**											**25000**									
MKE-FNC18	MKE-NAV20-18-3-5	3	5	9/30/2020	0.00062 U	**0.0038**	**0.0049**	**27**	**0.02** J	**11**	**22**	**1.8**	**0.19** J	**15**	**53**	0.17 U	**76**	**2.5**		**26000**	**620**											**14000**									
MKE-FNC18	MKE-NAV20-18-5-7	5	7	9/30/2020	0.0013 U	**0.0024** J	**0.0036** J	**25**	**0.023** J	**10**	**20**	**2.8**	**0.24**	**14**	**61**	0.17 U	**89**	**2.3**		**28000**	**820**											**24000**									
MKE-FNC18	MKE-NAV20-18-7-9	7	9	9/30/2020	0.0011 U	0.0011 U	0.0014 U	**8.5**	0.012 U	**4.1**	**7.8**	**1.9**	**0.11** J	**6.1**	**29**	0.17 U	**42**	**1**		**9900**	**420**											**15000**									
MKE-FNC19	MKE-NAV20-19-0-1	0	1	9/30/2020	**0.063**	**0.12**	**0.38**	**240**	**0.66**	**180**	**29**	**11**	**6.3**	**75**	**370**	**1.9**	**110**	**2.9**		**22000**	**430**											**54000** J+									
MKE-FNC19	MKE-NAV20-19-1-3	1	3	9/30/2020	**0.0033** J	**0.0062**	**0.0095**	**20**	**0.031** J	**13**	**14**	**1.6**	**0.44**	**14**	**56**	0.17 U	**86**	**2**		**18000**	**740**											**30000** J+									
MKE-FNC19	MKE-NAV20-19-3-5	3	5	9/30/2020	0.00068 U	0.00068 U	0.00086 U	**15**	0.022 U	**7.1**	**15**	**1.4**	**0.24**	**12**	**47**	0.17 U	**87**	**2**		**20000**	**840**											**30000**									
MKE-FNC19	MKE-NAV20-19-5-7	5	7	9/30/2020	0.0013 U	0.0013 U	0.0017 U	**17**	0.023 U	**7.4**	**16**	**1.3**	**0.21**	**11**	**46**	0.17 U	**80**	**2**		**20000**	**700**											**23000**									
MKE-FNC19	MKE-NAV20-19-7-9	7	9	9/30/2020	0.00065 U	0.00065 U	0.00082 U	**21**	**0.017** J	**8.8**	**19**	**1.4**	**0.19**	**13**	**45**	0.16 U	**67**	**2.2**		**22000**	**560**											**18000**									
MKE-FNC20	MKE-NAV20-20-0-1	0	1	10/2/2020	0.021 U	**0.059** J	**0.15** J+	**140**	**0.15**	**130**	**20**	**5**	**3**	**43**	**240**	**0.82**	**100**	**2.2**		**21000**	**600**											**50000** J			**0**	**0.7**	**4.5**	**59.8**	**35**		
MKE-FNC20	MKE-NAV20-20-1-3	1	3	10/2/2020	0.017 U	**0.12**	**0.27** J+	**17**	0.019 U	**8.1**	**13**	**1.7**	**0.27**	**12**	**48**	0.17 U	**88**	**1.7**		**19000**	**690**											**31000** J			**0**	**0.1**	**1.7**	**58.6**	**39.6**		
MKE-FNC20	MKE-NAV20-20-3-5	3	5	10/2/2020	0.0034 U	0.0034 U	0.0044 U	**21**	0.025 U	**7.8**	**15**	**1.8**	**0.26**	**13**	**51**	0.15 U	**94**	**1.9**		**23000**	**750**											**34000** J			**0**	**0.3**	**1.4**	**55.9**	**42.4**		
MKE-FNC20	MKE-NAV20-20-5-7	5	7	10/2/2020	0.0033 U	**0.0033** J	**0.006** J	**13**	0.024 U	**6.9**	**13**	**1.2**	**0.2**	**11**	**41**	0.16 U	**75**	**1.4**		**18000**	**710**											**26000** J			**0**	**0.4**	**1.2**	**52.7**	**45.7**		
MKE-FNC20	MKE-NAV20-20-7-9	7	9	10/2/2020	0.0013 U	0.0013 U	0.0017 U	**19**	0.02 U	**7.4**	**15**	**1.5**	**0.21**	**12**	**47**	0.17 U	**87**	**1.8**		**21000**	**710**											**24000** J			**0**	**0.1**	**0.5**	**52**	**47.4**		
MKE-FNC20	MKE-NAV20-20-9-11.3	9	11.3	10/2/2020	0.003 U	0.003 U	0.0038 U	**25**	0.022 U	**8.7**	**20**	**1.7**	**0.16** J	**14**	**46**	0.17 U	**76**	**2**		**24000**	**520**											**20000** J			**0**	**0.3**	**1**	**35.6**	**63.1**		
MKE-FNC21	MKE-NAV20-21-0-1	0	1	10/1/2020	0.025 U	**0.37** J	**0.65** J	**140**	**0.31**	**120**	**23**	**6.8**	**3.1**	**67**	**300**	**0.81**	**110**	**2.9**		**26000**	**540**											**59000** J									
MKE-FNC21	MKE-NAV20-21-1-3	1	3	10/1/2020	0.02 U	**0.034** J-	**0.093** J-	**290**	**0.41**	**170**	**25**	**7.8**	**4.9**	**85**	**390**	**1.6**	**110**	**2.7**		**25000**	**470**											**72000** J									
MKE-FNC21	MKE-NAV20-21-3-5	3	5	10/1/2020	**0.027** J	**0.11**	**0.18**	**430**	**0.56**	**230**	**32**	**10**	**7.2**	**95**	**470**	**2.3**	**120**	**3.2**		**29000**	**480**											**54000** J									
MKE-FNC21	MKE-NAV20-21-5-7	5	7	10/1/2020	**0.025** J	**0.12**	**0.2**	**200**	**0.4**	**140**	**25**	**6.2**	**4.4**	**51**	**230**	**1.4**	**93**	**2.4**		**23000**	**470**											**45000** J									
MKE-FNC21	MKE-NAV20-21-7-9	7	9	10/1/2020	0.0012 U	**0.0015** J	**0.0027** J	**19**	0.02 U	**10**	**18**	**1.4**	**0.18** J	**14**	**42**	0.17 U	**59**	**2.1**		**20000**	**500**											**14000** J									
MKE-FNC21	MKE-NAV20-21-9-11	9	11	10/1/2020	0.0013 U	**0.0023** J	**0.0042**	**20**	0.019 U	**27**	**19**	**1.6**	**0.21**	**14**	**47**	0.15 U	**69**	**2.2**		**22000**	**560**											**16000** J									
MKE-FNC21	MKE-NAV20-21-11-12	11	12	10/1/2020	0.00062 U	0.00062 U	0.00079 U	**28**	0.02 U	**13**	**23**	**1.8**	**0.2**	**16**	**53**	0.16 U	**79**	**2.6**		**27000**	**510**											**13000** J									
MKE-FNC22	MKE-NAV20-22-0-1	0	1	10/13/2020	0.00065 U	0.00065 U	0.00083 U	**27**	**0.018** J	**9.3**	**20**	**1.8**	**0.17** J	**14**	**47**	0.16 U	**76**	**2.6**		**24000**	**600**											**16000**									
MKE-FNC22	MKE-NAV20-22-1-3	1	3	10/13/2020	0.00066 U	0.00066 U	0.00084 U	**26**	0.025 U	**10**	**21**	**1.9**	**0.19** J	**15**	**51**	0.17 U	**77**	**2.5**		**23000**	**670**											**17000**									
MKE-FNC22	MKE-NAV20-22-3-5	3	5	10/13/2020	0.00065 U	0.00065 U	0.00083 U	**33**	**0.021** J	**11**	**23**	**1.9**	**0.19** J	**16**	**56**	0.16 U	**88**	**2.7**		**31000**	**560**											**14000**									
MKE-FNC22	MKE-NAV20-22-5-6.5	5	6.5	10/13/2020	0.00066 U	0.00066 U	0.00084 U	**22**	**0.021** J	**10**	**21**	**2.1**	**0.27**	**16**	**63**	0.17 U	**77**	**2.5**		**19000**	**710**											**24000**									
MKE-FNC23	MKE-NAV20-23-0-1	0	1	10/1/2020	0.023 U	**0.074**	**0.19**	**130**	**0.3**	**130**	**20**	**6.1**	**3.2**	**79**	**330**	**0.85**	**79**	**2.3**		**19000**	**480**											**58000** J									
MKE-FNC23	MKE-NAV20-23-1-3	1	3	10/1/2020	**0.018** J	**0.064**	**0.12**	**230**	**0.62**	**120**	**23**	**6.9**	**3.5**	**53**	**250**	**1.2**	**81**	**2.4**		**21000**	**470**											**42000** J									
MKE-FNC23	MKE-NAV20-23-1.4-2.4	1.4	2.4	10/1/2020	**0.032** J	**0.14**	**0.31**	**430**	**0.96**	**200**	**33**	**11**	**7.7**	**88**	**420**	**2.7**	**120**	**2.7**		**24000**	**450**											**76000** J									
MKE-FNC23	MKE-NAV20-23-3-5	3	5	10/1/2020	**0.0035** J	**0.011**	**0.023**	**50**	**0.15**	**29**	**19**	**2.5**	**0.8**	**18**	**68**	**0.19** J	**74**	**2.4**		**21000**	**540**											**21000** J									
MKE-FNC23	MKE-NAV20-23-5-7	5	7	10/1/2020	0.0013 U	**0.0015** J	**0.0025** J	**18**	0.023 U	**8.8** J-	**18**	**1.4**	**0.18** J	**13**	**41**	0.17 U	**60**	**2.1**		**19000**	**490**											**16000** J									
MKE-FNC23	MKE-NAV20-23-7-9	7	9	10/1/2020	0.0013 U	0.0013 U	0.0017 U	**26**	0.02 U	**17**	**20**	**1.7**	**0.19** J	**14**	**49**	0.17 U	**77**	**2.4**		**23000**	**540**											**15000** J									
MKE-FNC23	MKE-NAV20-23-9-11	9	11	10/1/2020	0.00065 U	0.00065 U	0.00083 U	**28**	**0.016** J	**11**	**22**	**1.9**	**0.19** J	**15**	**53**	0.17 U	**89**	**2.6**		**27000**	**600**											**15000** J									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB											PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8													
WI CBSQG PEC					3										68.4													
WI CBSQG PEC					5										114													
TSCA					50																							
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MKE-FNC23	MKE-NAV20-23-11-12.5	11	12.5	10/1/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	0.0005 U	0.00086 U	0.00068 U	0.00066 U	0.00066 U	0.00068 U	0.00086 U	0.00068 UJ	0.00086 U	0.00086 U	0.00095 UJ	0.00068 U	0.00086 U	0.001 U	0.00095 U	0.00086 U
MKE-FNC24	MKE-NAV20-24-0-1	0	1	10/1/2020	**0.032**	0.0083 U	0.0038 U	0.0028 U	0.015 U	0.004 U	0.0043 U	0.0061 U	0.0029 U	**0.032**	**0.97**	0.021 U	0.016 U	0.016 U	**0.016 J**	**0.083 J**	**0.057 J-**	**0.15 J**	**0.03 J**	**0.035 J**	**0.04 J**	**0.071**	0.021 UJ	**0.17**	0.023 U	**0.055 J-**
MKE-FNC24	MKE-NAV20-24-1-3	1	3	10/1/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 UJ	0.0013 U	0.0017 UJ	0.002 U	0.0019 U	0.0017 U
MKE-FNC24	MKE-NAV20-24-3-5	3	5	10/1/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0022 U	0.0021 U	**0.018**	0.0016 U	0.0013 U	0.0012 U	0.0012 U	**0.0014 J**	0.0016 U	0.0013 U	0.0016 U	0.0016 U	0.0018 UJ	**0.0013 J**	0.0016 UJ	**0.0027 J**	0.0018 U	0.0016 U
MKE-FNC24	MKE-NAV20-24-5-7	5	7	10/1/2020	0.006 U	0.0069 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	0.0005 U	0.00086 U	0.00068 U	0.00066 U	0.00066 U	0.00068 UJ	0.00086 U	0.00068 UJ	0.00086 U	0.00086 U	0.00095 UJ	0.00068 U	0.00086 UJ	0.001 U	0.00095 U	0.00086 U
MKE-FNC24	MKE-NAV20-24-7-8	7	8	10/1/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	0.00047 U	0.0008 U	0.00062 U	0.00061 U	0.00061 U	0.00062 U	0.0008 U	0.00062 UJ	0.0008 U	0.0008 U	0.00087 UJ	0.00062 U	0.0008 U	0.00094 U	0.00087 U	0.0008 U
MKE-FNC25	MKE-NAV20-25-0-1	0	1	10/1/2020	**0.018**	0.0077 U	0.0035 U	0.0026 U	0.014 U	0.0037 U	0.004 U	0.0056 U	0.0027 U	**0.018**	**1.3**	0.024 U	0.019 U	0.019 U	**0.021 J**	**0.12 J**	**0.084**	**0.21 J**	**0.041 J**	**0.043 J**	**0.053 J**	**0.1**	0.024 UJ	**0.23**	0.027 U	**0.076**
MKE-FNC25	MKE-NAV20-25-1-3	1	3	10/1/2020	0.005 U	0.0057 U	0.0026 U	0.0019 U	0.01 U	0.0027 U	0.0029 U	0.0041 U	0.002 U	0.0018 U	**1**	0.018 U	0.014 U	0.014 U	**0.022 J**	**0.11 J**	**0.074 J**	**0.13 J**	**0.028 J**	**0.03 J**	**0.04 J**	**0.07 J**	0.018 UJ	**0.2 J**	0.02 U	**0.058 J**
MKE-FNC25	MKE-NAV20-25-3-5	3	5	10/1/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.029**	0.0017 U	0.0013 U	0.0013 U	0.0013 U	**0.0027 J**	**0.0017 J**	**0.0037 J**	0.0017 U	0.0017 U	0.0018 UJ	**0.0019 J**	0.0017 UJ	**0.0046**	0.0018 U	0.0017 U
MKE-FNC25	MKE-NAV20-25-5-7	5	7	10/1/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.014**	0.00085 U	0.00067 U	0.00065 U	0.00065 U	**0.0013 J**	0.00085 U	0.00067 UJ	0.00085 U	0.00085 U	0.00093 UJ	**0.0011 J**	0.00085 UJ	**0.0025**	0.00093 U	**0.00089 J**
MKE-FNC25	MKE-NAV20-25-7-9	7	9	10/1/2020	0.006 U	0.0067 U	0.003 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	0.0005 U	0.00084 U	0.00066 U	0.00064 U	0.00064 U	0.00066 UJ	0.00084 U	0.00066 UJ	0.00084 U	0.00084 U	0.00092 UJ	0.00066 U	0.00084 UJ	0.00099 U	0.00092 U	0.00084 U
MKE-FNC25	MKE-NAV20-25-9-10.8	9	10.8	10/1/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	0.00048 U	0.00082 U	0.00064 U	0.00063 U	0.00063 U	0.00064 UJ	0.00082 U	0.00064 UJ	0.00082 U	0.00082 U	0.0009 UJ	0.00064 U	0.00082 UJ	0.00096 U	0.0009 U	0.00082 U
MKE-FNC26	MKE-NAV20-26-0-1	0	1	9/30/2020	0.0065 U	0.0074 U	0.0034 U	0.0025 U	0.013 U	0.0036 U	0.0038 U	0.0054 U	0.0026 U	0.0024 U	**0.44**	0.0047 U	0.0037 U	**0.0068 J**	**0.0083 J**	**0.049 J**	**0.034 J**	**0.055 J**	**0.013 J**	**0.014 J**	**0.017 J**	**0.032 J**	0.0047 U	**0.068 J**	0.0051 U	**0.024 J**
MKE-FNC26	MKE-NAV20-26-1-3	1	3	9/30/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	0.002 U	**0.017**	0.0016 U	0.0012 U	0.0012 U	0.0012 U	**0.0013 J**	0.0016 U	**0.0016 J**	0.0016 U	0.0016 U	0.0017 UJ	0.0012 U	0.0016 U	**0.0021 J**	0.0017 U	0.0016 U
MKE-FNC26	MKE-NAV20-26-3-5	3	5	9/30/2020	0.0065 U	0.0072 U	0.0033 U	0.0024 U	0.013 U	0.0035 U	0.0037 U	0.0052 U	0.0025 U	0.0023 U	0.0011 U	0.0018 U	0.0014 U	0.0014 U	0.0014 U	0.0014 UJ	0.0018 U	0.0014 UJ	0.0018 U	0.0018 U	0.002 UJ	0.0014 U	0.0018 U	0.0021 U	0.002 U	0.0018 U
MKE-FNC26	MKE-NAV20-26-5-6.7	5	6.7	9/30/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	0.00095 U	0.0016 U	0.0013 U	0.0012 U	0.0012 U	0.0013 UJ	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 UJ	0.0013 U	0.0016 U	0.0019 U	0.0018 U	0.0016 U
MKE-FNC27	MKE-NAV20-27-0-1	0	1	9/30/2020	**0.027**	0.0085 U	0.0039 U	0.0029 U	0.015 U	0.0041 U	0.0044 U	0.0062 U	0.003 U	**0.027**	**1.3**	0.011 U	0.0084 U	**0.0098 J**	**0.017 J**	**0.11 J**	**0.1**	**0.2 J**	**0.042**	**0.061**	**0.061 J**	**0.094**	**0.011 J**	**0.23**	0.012 U	**0.1**
MKE-FNC27	MKE-NAV20-27-1-3	1	3	9/30/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.026**	0.00085 U	0.00067 U	0.00065 U	0.00065 U	**0.0021 J**	**0.0017 J**	**0.0038 J**	0.00085 U	**0.00099 J**	**0.001 J**	**0.0018 J**	0.00085 U	**0.0041**	0.00093 U	**0.0016 J**
MKE-FNC27	MKE-NAV20-27-3-5	3	5	9/30/2020	0.006 U	0.0069 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	**0.024**	0.0017 U	0.0014 U	0.0013 U	0.0013 U	**0.0017 J**	0.0017 U	**0.0036 J**	0.0017 U	0.0017 U	0.0019 UJ	**0.0016 J**	0.0017 U	**0.0032 J**	0.0019 U	**0.0018 J**
MKE-FNC27	MKE-NAV20-27-5-7	5	7	9/30/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	0.0005 U	0.00086 U	0.00067 U	0.00066 U	0.00066 U	0.00067 UJ	0.00086 U	0.00067 UJ	0.00086 U	0.00086 U	0.00094 UJ	0.00067 U	0.00086 U	0.001 U	0.00094 U	0.00086 U
MKE-FNC27	MKE-NAV20-27-7-9	7	9	9/30/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	0.0005 U	0.00085 U	0.00067 U	0.00065 U	0.00065 U	0.00067 UJ	0.00085 U	0.00067 UJ	0.00085 U	0.00085 U	0.00093 UJ	0.00067 U	0.00085 U	0.001 U	0.00093 U	0.00085 U
MKE-FNC27	MKE-NAV20-27-9-10.8	9	10.8	9/30/2020	0.0065 U	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	0.0023 U	0.0011 U	0.0018 U	0.0014 U	0.0014 U	0.0014 U	0.0014 UJ	0.0018 U	0.0014 UJ	0.0018 U	0.0018 U	0.0019 UJ	0.0014 U	0.0018 U	0.0021 U	0.0019 U	0.0018 U
MKE-FNC28	MKE-NAV20-28-0-1	0	1	9/29/2020	0.009 U	0.0099 U	0.0045 U	0.0033 U	0.018 U	0.0048 U	0.0051 U	0.0072 U	0.0035 U	0.0032 U	**2.1**	0.012 U	0.0098 U	**0.018 J**	**0.025 J**	**0.18 J+**	**0.16**	**0.35 J**	**0.067**	**0.1**	**0.1 J**	**0.15**	**0.021 J**	**0.38**	0.014 U	**0.18**
MKE-FNC28	MKE-NAV20-28-1-3	1	3	9/29/2020	**0.0066 J**	0.0082 U	0.0037 U	0.0028 U	0.015 U	0.0039 U	0.0042 U	**0.0066 J**	0.0029 U	0.0026 U	**1.6**	0.01 U	0.0081 U	**0.014 J**	**0.028**	**0.15 J+**	**0.12**	**0.26 J**	**0.047**	**0.067**	**0.063 J**	**0.11**	**0.014 J**	**0.27**	0.011 U	**0.11**
MKE-FNC28	MKE-NAV20-28-3-5	3	5	9/29/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	**0.1**	0.0017 U	0.0013 U	0.0013 U	**0.0018 J**	**0.009 J**	**0.0073**	**0.017 J**	**0.0028 J**	**0.0042 J**	**0.0036 J**	**0.0067**	0.0017 U	**0.016**	0.0019 U	**0.0073**
MKE-FNC28	MKE-NAV20-28-5-7	5	7	9/29/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0048 U	0.0023 U	0.0021 U	**0.37**	0.0016 U	0.0013 U	**0.0034 J**	**0.01**	**0.042 J+**	**0.029**	**0.046 J**	**0.0092**	**0.014**	**0.016 J**	**0.033**	**0.0044**	**0.071**	**0.0019 J**	**0.023**
MKE-FNC28	MKE-NAV20-28-7-9	7	9	9/29/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 UJ	0.0013 U	0.0017 U	0.002 U	0.0019 U	0.0017 U
MKE-FNC28	MKE-NAV20-28-9-11	9	11	9/29/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0024 U	0.0022 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 UJ	0.0013 U	0.0017 U	0.002 U	0.0019 U	0.0017 U
MKE-FNC29	MKE-NAV20-29-0-1	0	1	10/8/2020	0.0075 U	0.0085 U	0.0039 U	0.0029 U	0.015 U	0.0041 U	0.0044 U	0.0062 U	0.003 U	0.0027 U	**0.56**	0.027 U	0.021 U	0.021 U	0.021 U	**0.043 J**	**0.037 J**	**0.092 J**	0.027 U	**0.027 J**	0.03 U	**0.04 J**	0.027 U	**0.079 J**	0.03 U	**0.038 J**
MKE-FNC29	MKE-NAV20-29-1-3	1	3	10/8/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	**0.018**	0.0016 U	0.0012 U	0.0012 U	0.0012 U	0.0012 UJ	0.0016 U	0.0012 UJ	0.0016 U	0.0016 U	0.0017 U	0.0012 U	0.0016 U	**0.003 J**	0.0017 U	0.0016 U
MKE-FNC29	MKE-NAV20-29-3-5	3	5	10/8/2020	0.006 U	0.0067 U	0.0031 U	0.0023 U	0.012 U	0.0032 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 UJ	0.0013 U	0.0017 U	0.002 U	0.0019 U	0.0017 U
MKE-FNC29	MKE-NAV20-29-5-7	5	7	10/8/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 UJ	0.0013 U	0.0017 U	0.002 U	0.0019 U	0.0017 U
MKE-FNC29	MKE-NAV20-29-7-8.5	7	8.5	10/8/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	0.001 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 UJ	0.0013 U	0.0017 U	0.002 U	0.0019 U	0.0017 U
MKE-FNC30	MKE-NAV20-30-0-1	0	1	10/8/2020	**0.016**	0.0087 U	0.004 U	0.0029 U	0.016 U	0.0042 U	0.0045 U	0.0063 U	0.003 U	**0.016**	**0.7**	0.055 U	0.043 U	0.042 U	0.042 U	**0.05 J**	0.055 U	**0.086 J**	0.055 U	0.055 U	0.06 U	**0.051 J**	0.055 U	**0.096 J**	0.06 U	0.055 U
MKE-FNC30	MKE-NAV20-30-1-3	1	3	10/8/2020	**0.019**	0.0085 U	0.0039 U	0.0029 U	0.015 U	0.0041 U	0.0044 U	0.0062 U	0.003 U	**0.019**	**0.54**	0.053 U	0.042 U	0.041 U	0.041 U	0.042 UJ	0.053 U	**0.055 J**	0.053 U	0.053 U	0.059 U	0.042 U	0.053 U	**0.066 J**	0.059 U	0.053 U
MKE-FNC30	MKE-NAV20-30-3-5	3	5	10/8/2020	**0.054**	0.0079 U	0.0036 U	0.0027 U	0.014 U	0.0038 U	0.0041 U	0.0058 U	0.0028 U	**0.054**	**0.67**	0.05 U	0.039 U	0.038 U	0.038 U	**0.05 J**	0.05 U	**0.084 J**	0.05 U	0.05 U	0.055 U	**0.053 J**	0.05 U	**0.1 J**	0.055 U	0.05 U
MKE-FNC30	MKE-NAV20-30-5-7	5	7	10/8/2020	0.0065 U	0.0069 U	0.0032 U	0.0023 U	0.013 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	**0.16**	0.0043 U	0.0034 U	0.0033 U	0.0033 U	**0.013 J**	**0.0097 J**	**0.023 J**	**0.0052 J**	**0.0067 J**	**0.0068 J**	**0.012**	0.0043 U	**0.028**	0.0048 U	**0.011**
MKE-FNC30	MKE-NAV20-30-7-9	7	9	10/8/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.017**	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 UJ	0.0017 U	0.0013 UJ	0.0017 U	0.0017 U	0.0019 U	0.0013 U	0.0017 U	**0.0024 J**	0.0019 U	0.0017 U
MKE-FNC30	MKE-NAV20-30-9-11.3	9	11.3	10/8/2020	0.006 U	0.0069 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	0.001 U	0.0017 U	0.0014 U	0.0013 U	0.0013 U	0.0014 UJ	0.0017 U	0.0014 UJ	0.0017 U	0.0017 U	0.0019 U	0.0014 U	0.0017 U	0.002 U	0.0019 U	0.0017 U
MKE-FNC31	MKE-NAV20-31-0-1	0	1	10/8/2020	0.007 U	0.0078 U	0.0036 U	0.0026 U	0.014 U	0.0038 U	0.004 U	0.0057 U	0.0027 U	0.0025 U	**0.29**	0.025 U	0.019 U	0.019 U	0.019 U	**0.019 J**	0.025 U	**0.038 J**	0.025 U	0.025 U	0.027 U	**0.019 J**	0.025 U	**0.037 J**	0.027 U	0.025 U
MKE-FNC31	MKE-NAV20-31-1-3	1	3	10/8/2020	0.0055 U	0.0062 U	0.0028 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0045 U	0.0022 U	0.002 U	**0.018**	0.0016 U	0.0012 U	0.0012 U	0.0012 U	0.0012 UJ	0.0016 U	**0.0014 J**	0.0016 U	**0.0021 J**	0.0017 U	0.0012 U	0.0016 U	0.0018 U	0.0017 U	**0.0033 J**
MKE-FNC31	MKE-NAV20-31-3-5	3	5	10/8/2020	0.0055 U	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0033 U	0.0046 U	0.0022 U	0.002 U	0.00047 U	0.0008 U	0.00062 U	0.00061 U	0.00061 U	0.00062 U	0.0008 U	0.00062 UJ	0.0008 U	0.0008 U	0.00087 U	0.00062 U	0.0008 U	0.00094 U	0.00087 U	0.0008 U
MKE-FNC31	MKE-NAV20-31-5-7	5	7	10/8/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.0072**	0.00083 U	0.00065 U	0.00063 U	0.00063 U	0.00065 U	0.00083 U	**0.00066 J**	0.00083 U	0.00083 U	0.00091 U	0.00065 U	0.00083 U	0.00097 U	0.00091 U	0.00083 U
MKE-FNC31	MKE-NAV20-31-7-9.4	7	9.4	10/8/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.0085**	0.00085 U	0.00067 U	0.00065 U	0.00065 U	0.00067 U	0.00085 U	**0.0012 J**	0.00085 U	0.00085 U	0.00094 U	0.00067 U	0.00085 U	0.001 U	0.00094 U	**0.00096 J**
MKE-FNC32	MKE-NAV20-32-0-1	0	1	10/8/2020	0.0065 U	0.0073 U	0.0034 U	0.0025 U	0.013 U	0.0035 U	0.0038 U	0.0054 U	0.0026 U	0.0024 U	**0.11**	0.0018 U	**0.0021 J**	**0.002 J**	**0.0018 J**	**0.012**	**0.01**	**0.012 J**	**0.0035 J**	**0.0052**	**0.0037 J**	**0.0072**	0.0018 U	**0.013**	**0.0029 J**	**0.007**
MKE-FNC32	MKE-NAV20-32-1-3	1	3	10/8/2020	0.0055 U	0.006 U	0.0027 U	0.002 U	0.011 U	0.0029 U	0.0031 U	0.0043 U	0.0021 U	0.0019 U	**0.0097**	0.00075 U	0.00059 U	0.00057 U	0.00057 U	**0.00064 J**	0.00075 U	**0.00096 J**	0.00075 U	0.00075 U	0.00082 U	0.00059 U	0.00075 U	**0.0015 J**	0.00082 U	0.00075 U
MKE-FNC32	MKE-NAV20-32-3-5	3	5	10/8/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	**0.0081**	0.00086 U	0.00067 U	0.00065 U	0.00065 U	0.00067 U	0.00086 U	**0.0013 J**	0.00086 U	0.00086 U	0.00094 U	0.00067 U	0.00086 U	0.001 U	0.00094 U	0.00086 U
MKE-FNC32	MKE-NAV20-32-5-7	5	7	10/8/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	0.00048 U	0.00082 U	0.00064 U	0.00063 U	0.00063 U	0.00064 U	0.00082 U	0.00064 UJ	0.00082 U	0.00082 U	0.0009 U	0.00064 U	0.00082 U	0.00096 U	0.0009 U	0.00082 U
MKE-FNC32	MKE-NAV20-32-7-8.6	7	8.6	10/8/2020	0.006 U	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	**0.0074**	0.00083 U	0.00065 U	0.00064 U	0.00064 U	0.00065 U	0.00083 U	**0.00078 J**	0.00083 U	0.00083 U	0.00092 U	0.00065 U	0.00083 U	0.00098 U	0.00092 U	0.00083 U
MKE-FNC33	MKE-NAV20-33-0-1	0	1	10/8/2020	0.0075 U	0.0081 U	0.0037 U	0.0027 U	0.015 U	0.0039 U	0.0041 U	0.0059 U	0.0028 U	0.0026 U	**0.52**	0.02 U	0.016 U	0.016 U	0.016 U	**0.041 J**	**0.031 J**	**0.076 J**	0.02 U	**0.022 J**	0.02 U	**0.037 J**	0.02 U	**0.088**	0.022 U	**0.036 J**
MKE-FNC33	MKE-NAV20-33-1-3	1	3	10/8/2020	0.008 U	0.0086 U	0.0039 U	0.0029 U	0.016 U	0.0041 U	0.0044 U	0.0062 U	0.003 U	0.0028 U	**0.52**	0.022 U	0.017 U	0.017 U	0.017 U	**0.038 J**	**0.035 J**	**0.086 J**	0.022 U	**0.024 J**	**0.024 J**	**0.04 J**	0.022 U	**0.071**	0.024 U	**0.04 J**
MKE-FNC33	MKE-NAV20-33-3-5	3	5	10/8/2020	**0.021**	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	**0.021**	**0.49**	0.021 U	0.017 U	0.016 U	0.016 U	**0.038 J**	**0.028 J**	**0.07 J**	0.021 U	0.021 U	0.024 U	**0.035 J**	0.021 U	**0.085**	0.024 U	**0.031 J**
MKE-FNC33	MKE-NAV20-33-5-7	5	7	10/8/2020	0.0065 U	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	0.0022 U	**0.017**	0.00088 U	0.00069 U	0.00067 U	0.00067 U	**0.0013 J**	**0.0011 J**	**0.0031 J**	0.00088 U	**0.0011 J**	0.00097 U	**0.0014 J**	0.00088 U	**0.0021 J**	0.00097 U	**0.0017 J**
MKE-FNC33	MKE-NAV20-33-7-9	7	9	10/8/2020	0.006 U	0.0067 U	0.003 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	**0.026**	0.00084 U	0.00066 U	0.00064 U	0.00064 U	**0.0021**	**0.0014 J**	**0.0042 J**	0.00084 U	**0.0011 J**	**0.00095 J**	**0.0017 J**	0.00084 U	**0.0043**	0.00092 U	**0.0017 J**
MKE-FNC33	MKE-NAV20-33-9-10.7	9	10.7	10/8/2020	0.006 U	0.0067 U	0.003 U	0.0023 U	0.012 U	0.0032 U	0.0034 U	0.0049 U	0.0023 U	0.0021 U	**0.0077**	0.00084 U	0.00066 U	0.00064 U	0.00064 U	0.00066 U	0.00084 U	**0.0011 J**	0.00084 U	0.00084 U	0.00092 U	0.00066 U	0.00084 U	0.00099 U	0.00092 U	0.00084 U
MKE-FNC34	MKE-NAV20-34-0-1	0	1	10/13/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	**0.058**	0.0043 U	0.0034 U	0.0033 U	0.0033 U	**0.0041 J**	0.0043 U	**0.0079 J**	0.0043 U	0.0043 U	0.0047 U	**0.0034 J**	0.0043 U	**0.0093 J**	0.0047 U	0.0043 U
MKE-FNC34	MKE-NAV20-34-1-3	1	3	10/13/2020	0.0065 U	0.007 U	0.0032 U	0.0024 U	0.013 U	0.0034 U	0.0036 U	0.0051 U	0.0025 U	0.0022 U	0.0011 U	0.0018 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0018 U	0.0014 UJ	0.0018 U	0.0018 U	0.0019 U	0.0014 U	0.0018 U	0.0021 U	0.0019 U	0.0018 U
MKE-FNC34	MKE-NAV20-34-3-5	3	5	10/13/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0023 U	0.0021 U	0.00095 U	0.0016 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 U	0.0013 U	0.0016 U	0.0019 U	0.0018 U	0.0016 U
MKE-FNC34	MKE-NAV20-34-5-7	5	7	10/13/2020	0.006 U	0.0065 U	0.003 U	0.0022 U	0.012 U	0.0031 U	0.0034 U	0.0048 U	0.0023 U	0.0021 U	0.00095 U	0.0016 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0016 U	0.0013 UJ	0.0016 U	0.0016 U	0.0018 U	0.0013 U	0.0016 U	0.0019 U	0.0018 U	0

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																						Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																												
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
MKE-FNC23	MKE-NAV20-23-11-12.5	11	12.5	10/1/2020	0.00068 U	0.00068 U	0.00086 U	23	0.02 U	12	22	1.8	0.44	15	54	0.16 U	76	2.4		25000	540											16000 J									
MKE-FNC24	MKE-NAV20-24-0-1	0	1	10/1/2020	0.018 J	0.056	0.14	120	0.5	86	14	3.2	2.5	26	140	0.71	52	1.4		12000	320											49000									
MKE-FNC24	MKE-NAV20-24-1-3	1	3	10/1/2020	0.0013 U	0.0013 U	0.0017 U	19	0.021 J	9.3	18	1.3	0.18 J	14	43	0.17 U	60	2.2		19000	570											16000									
MKE-FNC24	MKE-NAV20-24-3-5	3	5	10/1/2020	0.0013 U	0.0013 U	0.0021 J	24	0.013 J	10	20	1.6	0.19 J	14	46	0.17 U	65	2.4		24000	550											16000									
MKE-FNC24	MKE-NAV20-24-5-7	5	7	10/1/2020	0.00068 U	0.00068 U	0.00086 U	19	0.023 U	9.5	20	1.4	0.2	15	50	0.17 U	73	2.3		23000	700											18000									
MKE-FNC24	MKE-NAV20-24-7-8	7	8	10/1/2020	0.00062 U	0.00062 U	0.0008 U	27	0.02 U	13	22	1.8	0.21	15	50	0.17 U	71	2.5		28000	550											13000 J									
MKE-FNC25	MKE-NAV20-25-0-1	0	1	10/1/2020	0.019 U	0.078	0.18	210	0.44	150	21	6.4	4	59	280	1.3	86	2.3		18000	420											42000			0	2.4	21.5	53.9	22.2		
MKE-FNC25	MKE-NAV20-25-1-3	1	3	10/1/2020	0.014 U	0.057 J	0.17 J	73	0.31	57	11	3.8	1.5	21	96	0.56	56	1.5		11000	330											23000			0	8.7	49.3	26.4	15.6		
MKE-FNC25	MKE-NAV20-25-3-5	3	5	10/1/2020	0.0013 U	0.0015 J	0.0041 J	17	0.025 U	8	17	1.4	0.2	12	46	0.17 U	75	2		20000	630											20000			0	1.1	4.6	47.8	46.5		
MKE-FNC25	MKE-NAV20-25-5-7	5	7	10/1/2020	0.00067 U	0.001 J	0.002 J	22	0.021 U	8.9	19	1.5	0.19	13	46	0.17 U	69	2.3		22000	570											18000			0	0.2	1.4	36.5	61.9		
MKE-FNC25	MKE-NAV20-25-7-9	7	9	10/1/2020	0.00066 U	0.00066 U	0.00084 U	25	0.023 U	9.2	20	1.8	0.18 J	14	47	0.17 U	73	2.4		23000	550											16000			0	0	0.9	30.7	68.4		
MKE-FNC25	MKE-NAV20-25-9-10.8	9	10.8	10/1/2020	0.00064 U	0.00064 U	0.00082 U	24	0.018 J	9.6	20	1.7	0.17 J	14	47	0.17 U	68	2.4		25000	560											14000			0	0.1	0.7	36.2	63		
MKE-FNC26	MKE-NAV20-26-0-1	0	1	9/30/2020	0.0043 J	0.024 J	0.078 J	51	0.076	33 J	12	2.3	0.83	19	83	0.21 J	70	1.7		13000	450											36000 J+									
MKE-FNC26	MKE-NAV20-26-1-3	1	3	9/30/2020	0.0012 U	0.0012 U	0.0021 J	16	0.026 J	9.4	15	1.5	0.17	12	39	0.15 U	57	1.8		16000	520											18000 J+									
MKE-FNC26	MKE-NAV20-26-3-5	3	5	9/30/2020	0.0014 U	0.0014 U	0.0018 U	22	0.023 J	9.8	21	1.5	0.2	15	50	0.16 U	72	2.5		24000	640											20000 J+									
MKE-FNC26	MKE-NAV20-26-5-6.7	5	6.7	9/30/2020	0.0013 U	0.0013 U	0.0016 U	28	0.022 J	11	23	1.8	0.19 J	16	55	0.17 U	82	2.6		28000	580											16000 J+									
MKE-FNC27	MKE-NAV20-27-0-1	0	1	9/30/2020	0.014 J	0.066	0.19	170	0.32	130	23	5.8	3.3	59	260	1.2	99	2.4		22000	530											55000 J+									
MKE-FNC27	MKE-NAV20-27-1-3	1	3	9/30/2020	0.00067 U	0.0016 J	0.0038	32	0.025 J	11	21	1.8	0.26	15	52	0.17 U	76	2.6		25000	540											16000 J+									
MKE-FNC27	MKE-NAV20-27-3-5	3	5	9/30/2020	0.0014 U	0.0014 U	0.0027 J	21	0.023 J	9.4	20	1.5	0.2	14	49	0.16 U	70	2.2		22000	640											22000 J+									
MKE-FNC27	MKE-NAV20-27-5-7	5	7	9/30/2020	0.00067 U	0.00067 U	0.00086 U	27	0.024 J	10	22	2.2	0.21	15	56	0.17 U	81	2.5		27000	630											18000 J+									
MKE-FNC27	MKE-NAV20-27-7-9	7	9	9/30/2020	0.00067 U	0.00067 U	0.00085 U	26	0.026 J	11	24	1.7	0.24	16	61	0.17 U	80	2.6		27000	640											19000 J+									
MKE-FNC27	MKE-NAV20-27-9-10.8	9	10.8	9/30/2020	0.0014 U	0.0014 U	0.0018 U	16	0.024 J	8.5	17	1.9	0.25	14	57	0.17 U	91	2.1		21000	670											31000 J+									
MKE-FNC28	MKE-NAV20-28-0-1	0	1	9/29/2020	0.018 J	0.093	0.29	130	0.31	89	20	5.2	2.7	59	260	0.77	90	2.4		21000	520											55000 J+									
MKE-FNC28	MKE-NAV20-28-1-3	1	3	9/29/2020	0.02 J	0.068	0.22	190	0.35	100	17	5.4	3.3	60	280	1	78	2		16000	440											56000 J+									
MKE-FNC28	MKE-NAV20-28-3-5	3	5	9/29/2020	0.0014 J	0.0057	0.015	17	0.04 J	9.6	7.2	1.1	0.28	8.2	37	0.17 U	48	1.4		8800	360											45000 J+									
MKE-FNC28	MKE-NAV20-28-5-7	5	7	9/29/2020	0.0013 U	0.013	0.053	20	0.022 J	7.5	17	1.4	0.16 J	12	41	0.17 U	61	2.1		20000	530											19000 J+									
MKE-FNC28	MKE-NAV20-28-7-9	7	9	9/29/2020	0.0013 U	0.0013 U	0.0017 U	25	0.026 U	10	21	1.7	0.22	15	55	0.16 U	78	2.5		25000	620											20000 J+									
MKE-FNC28	MKE-NAV20-28-9-11	9	11	9/29/2020	0.0013 U	0.0013 U	0.0017 U	25	0.027 J	11	23	1.6	0.21	16	58	0.17 U	74	2.5		27000	600											18000 J+									
MKE-FNC29	MKE-NAV20-29-0-1	0	1	10/8/2020	0.021 U	0.025 J	0.067 J	69	0.12	76	14	3.3	1.3	32	150	0.28 J	74	1.9		15000	420											41000									
MKE-FNC29	MKE-NAV20-29-1-3	1	3	10/8/2020	0.0012 U	0.0013 J	0.0026 J	9.3	0.053	20	6.3	1.3	0.12 J	6.1	30	0.17 U	32	1.2		6500	230											17000									
MKE-FNC29	MKE-NAV20-29-3-5	3	5	10/8/2020	0.0013 U	0.0013 U	0.0017 U	22	0.11	9.5	20	1.7	0.19 J	14	46	0.17 U	68	2.6		22000	610											18000									
MKE-FNC29	MKE-NAV20-29-5-7	5	7	10/8/2020	0.0013 U	0.0013 U	0.0017 U	27	0.097	10	22	1.9	0.19 J	15	51	0.17 U	77	2.8		26000	580											16000									
MKE-FNC29	MKE-NAV20-29-7-8.5	7	8.5	10/8/2020	0.0013 U	0.0013 U	0.0017 U	21	0.027 J	10	22	2.4	0.24	16	57	0.17 U	71	2.6		23000	680											17000									
MKE-FNC30	MKE-NAV20-30-0-1	0	1	10/8/2020	0.043 U	0.043 U	0.086 J	190	0.34	110	19	5.3	3.3	61	260	1.1	87	2.2		18000	480											46000			0	2.7	22.1	48.6	26.6		
MKE-FNC30	MKE-NAV20-30-1-3	1	3	10/8/2020	0.042 U	0.042 U	0.056 J	490	0.41	150	24	6.6	4.3	78	340	1.6	100	2.7		23000	500											48000			0	1.7	12.6	53.1	32.6		
MKE-FNC30	MKE-NAV20-30-3-5	3	5	10/8/2020	0.039 U	0.039 U	0.082 J	470	0.44	200	29	7.8	7.9	76	360	2.6	110	2.8		24000	520											45000			0	0.1	11	58.8	30.1		
MKE-FNC30	MKE-NAV20-30-5-7	5	7	10/8/2020	0.0034 U	0.011	0.023	97	0.049 J	51	21	2.6	1.5	24	95	0.39 J	74	2.5		22000	600											20000			0	0.1	1.1	34.4	64.4		
MKE-FNC30	MKE-NAV20-30-7-9	7	9	10/8/2020	0.0013 U	0.0013 U	0.0019 J	25	0.02 U	10	21	2	0.24	15	57	0.17 U	83	2.7		23000	590											15000			0	0.1	0.4	28	71.5		
MKE-FNC30	MKE-NAV20-30-9-11.3	9	11.3	10/8/2020	0.0014 U	0.0014 U	0.0017 U	88	0.024 U	59	14	3.7	1.7	41	160	0.4 J	79	2.1		15000	490											17000			0	0.1	1.1	29.9	68.9		
MKE-FNC31	MKE-NAV20-31-0-1	0	1	10/8/2020	0.019 U	0.019 U	0.031 J	96	0.11	67	14	3.7	1.8	43	170	0.47 J	69	1.9		14000	430											35000									
MKE-FNC31	MKE-NAV20-31-1-3	1	3	10/8/2020	0.0012 U	0.0012 U	0.0016 U	11	0.024 U	7.6	7.4	1.2	0.15 J	6.5	28	0.15 U	49	1.5		10000	370											19000									
MKE-FNC31	MKE-NAV20-31-3-5	3	5	10/8/2020	0.00062 U	0.00062 U	0.0008 U	19	0.016 U	8.6	19	1.6	0.16 J	13	40	0.17 U	64	2.5		19000	540											13000									
MKE-FNC31	MKE-NAV20-31-5-7	5	7	10/8/2020	0.00065 U	0.00065 U	0.00083 U	25	0.023 U	14	20	1.7	2.8	18	46	0.16 U	71	2.6		24000	560											15000									
MKE-FNC31	MKE-NAV20-31-7-9.4	7	9.4	10/8/2020	0.00067 U	0.00067 U	0.00085 U	27	0.018 U	10	22	1.8	0.2	15	49	0.15 U	78	2.6		28000	600											17000									
MKE-FNC32	MKE-NAV20-32-0-1	0	1	10/8/2020	0.0024 J	0.0055	0.014	22	0.066	28	8.2	2	0.21	10	42	0.17 U	58	1.7		10000	400											32000									
MKE-FNC32	MKE-NAV20-32-1-3	1	3	10/8/2020	0.00059 U	0.0008 J	0.0013 J	12	0.018 U	12	8.4	1.2	0.1 J	5.9	27	0.17 U	39	1.4		10000	280											8700									
MKE-FNC32	MKE-NAV20-32-3-5	3	5	10/8/2020	0.00067 U	0.00067 U	0.00086 U	21	0.022 U	8.9	19	1.4	0.17 J	14	43	0.16 U	62	2.4		19000	550											18000									
MKE-FNC32	MKE-NAV20-32-5-7	5	7	10/8/2020	0.00064 U	0.00064 U	0.00082 U	23	0.018 U	10	22	2.1	0.19 J	15	48	0.17 U	72	2.6		29000	600											13000									
MKE-FNC32	MKE-NAV20-32-7-8.6	7	8.6	10/8/2020	0.00065 U	0.00065 U	0.00083 U	30	0.022 U	11	23	2.1	0.2	15	54	0.16 U	81	2.8		32000	600											16000									
MKE-FNC33	MKE-NAV20-33-0-1	0	1	10/8/2020	0.016 U	0.038 J	0.071	89	0.16	58	14	3.4	1.4	37	150	0.39 J	66	1.9		16000	420											30000									
MKE-FNC33	MKE-NAV20-33-1-3	1	3	10/8/2020	0.017 U	0.023 J	0.058	1800	0.29	160	28	7.2	4.8	90	390	2.2	110	2.7		23000	500											64000									
MKE-FNC33	MKE-NAV20-33-3-5	3	5	10/8/2020	0.017 U	0.032 J	0.067	930	0.19	78	23	3.4	1.9	37	150	0.75	73	2.5		27000	510											18000									
MKE-FNC33	MKE-NAV20-33-5-7	5	7	10/8/2020	0.00069 U	0.00069 U	0.0017 J	24	0.015 U	9.5	20	1.7	0.2	14	47	0.17 U	73	2.5		26000	680											17000									
MKE-FNC33	MKE-NAV20-33-7-9	7	9	10/8/2020	0.00066 U	0.0014 J	0.0037	23	0.017 U	10	20	1.2	0.21	14	49	0.14 U	69	2.5		23000	570											14000									
MKE-FNC33	MKE-NAV20-33-9-10.7	9	10.7	10/8/2020	0.00066 U	0.00066 U	0.00084 U	29	0.017 J	11	22	2	0.23	15	58	0.15 U	81	2.9		29000	640											17000									
MKE-FNC34	MKE-NAV20-34-0-1	0	1	10/13/2020	0.0034 U	0.0034 U	0.0077 J	15	0.02 J	9.4	8.7	1.5	0.21	9.2	40	0.17 U	69	1.5		10000	510											31000									
MKE-FNC34	MKE-NAV20-34-1-3	1	3	10/13/2020	0.0014 U	0.0014 U	0.0018 U	23	0.024 U	11	17	1.9	0.38	14	80	0.17 U	70	2.3		22000	540											36000									
MKE-FNC34	MKE-NAV20-34-3-5	3	5	10/13/2020	0.0013 U	0.0013 U	0.0016 U	21	0.025 U	15	19	1.8	0.91	14	140	0.17 U	63	2.3		21000	530											16000									
MKE-FNC34	MKE-NAV20-34-5-7	5	7	10/13/2020	0.0013 U	0.0013 U	0.0016 U	19	0.017 U	9.3	20	1.5	0.17 J	14	44	0.17 U	67	2.4		18000	620											19000									
MKE-FNC35	MKE-NAV20-35-0-1	0	1	10/13/2020	0.0012 U	0.0012 U	0.0016 U	15	0.014 U	7.8	14	1.3	0.17 J	11	37	0.16 U	61	1.9		15000	500											18000			2.7	5	11	28.8	49.1		
MKE-FNC35	MKE-NAV20-35-1-3	1	3	10/13/2020	0.00064 U	0.00064 U	0.00082 U	17	0.02 U	8.5	17	1.3	0.14 J	13	37	0.16 U	56	2		11000	490											16000			0.6	0.7	2	31.4	65.3		
MKE-FNC35	MKE-NAV20-35-3-5	3	5	10/13/2020	0.0013 U	0.0013 U	0.0016 U	20	0.018 U	8.9	18	1.5	0.15 J	13	40	0.14 U	60	2.1		20000	520											14000			1.1	3.6	4.3	29.5	61.5		
MKE-FNC35	MKE-NAV20-35-5-6.5	5	6.5	10/13/2020	0.00065 U	0.00065 U	0.00083 U	21	0.015 U	8.6	19	1.4	0.1 U	13	42	0.17 U	64	2.4		20000	550											17000			0	1.4	0.9	28	69.7		
MKE-FNC36	MKE-NAV20-36-0-1	0	1	10/9/2020	0.026 U	0.026 U	0.039 J	99	0.21	69	19	4.7	1.8	55	230	0.6	130	2.7		22000	760											57000									
MKE-FNC36	MKE-NAV20-36-1-3	1	3	10/9/2020	0.02 U	0.059 J	0.13	410	0.54	120	22	5.6	3.2	68	280	1.3	130	2.6		24000	710											49000									
MKE-FNC36	MKE-NAV20-36-3-5	3	5	10/9/2020	0.02 U	0.1	0.22	970	0.43	180	26	6.8	5.6	82	340	2.2	110	2.3		18000	510											45000									
MKE-FNC36	MKE-NAV20-36-5-7	5	7	10/9/2020	0.0066 U	0.038 J+	0.08 J+	320	0.15	47	21	2.4	1.1	25	91	0.42	73	2.3		32000	470											18000									
MKE-FNC36	MKE-NAV20-36-7-9	7	9	10/9/2020	0.00066 U	0.0011 J	0.002 J	26	0.025 U	10	21	1.7	0.21	15	51	0.17 U	79	2.7		27000	650											20000									
MKE-FNC36	MKE-NAV20-36-9-11.5	9	11.5	10/9/2020	0.0013 U	0.0013 U	0.0029 J	26	0.021 U	10	20	1.5	0.22	15	48	0.16 U	75	2.3		25000	640											16000									
MKE-FNC37	MKE-NAV20-37-0-1	0	1	10/13/2020	0.021	0.05 J+	0.03 J+	20	0.021 J	14	13	1.7	0.38	11	50	0.16 U	71	1.8		16000	620											17000									
MKE-FNC37	MKE-NAV20-37-1-3	1	3	10/13/2020	0.0013 U	0.0013 U	0.0016 U	24	0.016 J	9	19	1.6	0.095 U	14	43	0.16 U	63	2.5		21000	490											15000									
MKE-FNC37	MKE-NAV20-37-3-5	3	5	10/13/2020	0.00063 U	0.00063 U	0.0008 U	19	0.017 U	8.8	19	1.5	0.099 U	14	44	0.16 U	63	2.5		19000	540											18000									
MKE-FNC37	MKE-NAV20-37-5-7	5	7	10/13/2020	0.0013 U	0.0013 U	0.0016 U	26	0.019 J	8.9	20	1.6	0.1 U	14	45	0.17 U	75	2.7		23000	580											17000									
MKE-FNC37	MKE-NAV20-37-7-8.4	7	8.4	10/13/2020	0.0013 U	0.0013 U	0.0017 U	29	0.023 J	9.8	21	1.9	0.21	14	52	0.17 U	93	2.7		26000	660											19000									
MKE-FNC38	MKE-NAV20-38-0-1	0	1	10/9/2020	0.02 U	0.02 J	0.061 J	78	0.19	64	16	4.1	1.6	46	200	0.46	85	2.2		19000	500											63000									
MKE-FNC38	MKE-NAV20-38-1-3	1	3	10/9/2020	0.017 U	0.017 J	0.049 J	270	0.22	100	21	5.8	2.6	65	270	1.2	120	2.8		22000	490											55000									
MKE-FNC38	MKE-NAV20-38-3-5	3	5	10/9/2020	0.015 U	0.062 J+	0.13 J+	530	0.35	150	22	5.6	5.2	63	270	2.1	99	2.1		21000	390											41000									
MKE-FNC38	MKE-NAV20-38-5-7	5	7	10/9/2020	0.0013 U	0.0048 J+	0.0093 J+	26	0.035 J	9.3	17	1.5	0.25	12	46	0.15 U	86	2.2		22000	660											20000									
MKE-FNC38	MKE-NAV20-38-7-9	7	9	10/9/2020	0.00066 U	0.0011 J	0.0025 J+	23	0.02 U	8.9	20	1.6	0.17 J	14	44	0.17 U	71	2.3		24000	550											17000									
MKE-FNC38	MKE-NAV20-38-9-11.2	9	11.2	10/9/2020	0.00065 U	0.00065 U	0.00083 U	25	0.017 U	9.2	20	2	0.17 J	14	45	0.17 U	77	2.5		18000	600											17000									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB											PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8														
WI CBSQG PEC					3										68.4														
WI CBSQG PEC					5										114														
TSCA					50																								
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MKE-FNC39	MKE-NAV20-39-0-1	0	1	10/13/2020	0.008 U	0.009 U	0.0041 U	0.003 U	0.016 U	0.0043 U	0.0046 U	0.0066 U	0.0032 U	0.0029 U	**0.33**	0.011 U	0.0089 U	0.0087 U	0.0087 U	**0.024 J**	**0.02 J**	**0.059 J**	0.011 U	**0.015 J**	**0.015 J**	**0.023 J**	0.011 U	**0.053 J+**	0.012 U	**0.025 J**
MKE-FNC39	MKE-NAV20-39-1-3	1	3	10/13/2020	**0.056**	0.0055 U	0.0025 U	0.0019 U	0.01 U	0.0027 U	0.0028 U	0.004 U	0.0019 U	**0.056**	**0.84**	0.014 U	0.011 U	0.011 U	**0.011 J**	**0.072 J+**	**0.059**	**0.14 J**	**0.024 J**	**0.032 J**	**0.038 J+**	**0.055**	0.014 U	**0.14 J+**	0.015 U	**0.06**
MKE-FNC39	MKE-NAV20-39-3-5	3	5	10/13/2020	**0.03**	0.005 U	0.0023 U	0.0017 U	0.009 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	**0.03**	**0.61**	0.016 U	0.012 U	0.012 U	0.012 U	**0.053 J+**	**0.041**	**0.094 J**	**0.016 J**	**0.019 J**	**0.025 J**	**0.041**	0.016 U	**0.11 J+**	0.017 U	**0.036 J**
MKE-FNC39	MKE-NAV20-39-5-5.9	5	5.9	10/13/2020	0.0045 U	0.005 U	0.0023 U	0.0017 U	0.009 U	0.0024 U	0.0026 U	0.0036 U	0.0017 U	0.0016 U	**0.04**	0.00063 U	**0.0031**	0.00048 U	**0.0019 J+**	**0.0023 J+**	**0.0015 J**	**0.0039 J**	**0.00068 J**	**0.00099 J**	**0.0009 J**	**0.0017**	0.00063 UJ	**0.0069 J+**	**0.0029 J+**	**0.0018**
MKE-FNC40	MKE-NAV20-40-0-1	0	1	10/9/2020	0.009 U	0.01 U	0.0047 U	0.0035 U	0.018 U	0.0049 U	0.0052 U	0.0074 U	0.0036 U	0.0033 U	**0.81**	0.032 U	0.025 U	0.025 U	0.025 U	**0.066 J**	**0.053 J**	**0.15 J+**	0.032 U	**0.037 J**	0.035 U	**0.052 J**	0.032 U	**0.12 J+**	0.035 U	**0.068 J**
MKE-FNC40	MKE-NAV20-40-1-3	1	3	10/9/2020	**0.014**	0.0083 U	0.0038 U	0.0028 U	0.015 U	0.004 U	0.0043 U	0.006 U	0.0029 U	**0.014**	**0.35**	0.021 U	0.016 U	0.016 U	0.016 U	**0.025 J**	**0.021 J**	**0.059 J+**	0.021 U	0.021 U	0.023 U	**0.021 J**	0.021 U	**0.049 J**	0.023 U	**0.028 J**
MKE-FNC40	MKE-NAV20-40-3-5	3	5	10/9/2020	**0.011 J**	0.0084 U	0.0038 U	0.0028 U	0.015 U	0.0041 U	0.0043 U	0.0061 U	0.003 U	**0.011 J**	**0.33**	0.021 U	0.017 U	0.016 U	0.016 U	**0.024 J**	0.021 UJ	**0.053 J**	0.021 U	0.021 U	0.023 UJ	**0.021 J**	0.021 U	**0.047 J**	0.023 U	**0.024 J**
MKE-FNC40	MKE-NAV20-40-5-7	5	7	10/9/2020	**0.59**	0.061 U	0.028 U	0.021 U	0.11 U	0.029 U	0.031 U	0.044 U	0.021 U	**0.59**	**0.19**	0.0038 U	0.003 U	0.0029 U	0.0029 U	**0.017 J+**	**0.013 J-**	**0.033 J+**	**0.0056 J**	**0.008 J**	**0.0077 J**	**0.013**	0.0038 U	**0.031 J+**	0.0042 U	**0.014 J+**
MKE-FNC40	MKE-NAV20-40-7-9	7	9	10/9/2020	0.0047 U	0.0051 U	0.0023 U	0.0017 U	0.0093 U	0.0025 U	0.0026 U	0.0037 U	0.0018 U	0.0017 U	**0.011**	0.00065 U	0.00051 U	0.0005 U	0.0005 U	**0.00079 J**	0.00065 U	**0.0017 J+**	0.00065 U	0.00065 U	0.00071 U	**0.0006 J**	0.00065 U	**0.0015 J**	0.00071 U	**0.00067 J**
MKE-FNC40	MKE-NAV20-40-9-11.3	9	11.3	10/9/2020	0.0045 U	0.0049 U	0.0022 U	0.0017 U	0.0089 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	**0.0081**	0.00062 U	**0.0018**	0.00047 U	0.00047 U	0.00048 U	0.00062 U	**0.00084 J**	0.00062 U	0.00062 U	0.00068 U	0.00048 U	0.00062 U	**0.00079 J**	0.00068 U	0.00062 U
MKE-FNC41	MKE-NAV20-41-0-1	0	1	10/15/2020	**0.014**	0.0076 U	0.0035 U	0.0026 U	0.014 U	0.0037 U	0.0039 U	0.0056 U	0.0027 U	**0.014**	**0.48**	0.019 U	0.015 U	0.015 U	0.015 UJ	**0.044 J**	**0.029 J**	**0.074 J**	0.019 U	0.019 UJ	**0.021 J**	**0.031 J**	0.019 UJ	**0.079 J**	0.021 U	**0.03 J**
MKE-FNC41	MKE-NAV20-41-1-3	1	3	10/15/2020	**0.018 J**	0.0075 U	0.0034 U	0.0026 U	0.014 U	0.0036 U	0.0039 U	0.0055 U	0.0026 U	**0.018 J**	**0.91**	0.024 U	0.019 U	0.018 U	0.018 UJ	**0.075 J+**	**0.056 J**	**0.14 J**	**0.026 J**	**0.034 J**	**0.037 J**	**0.062 J-**	0.024 UJ	**0.16**	0.026 U	**0.061 J-**
MKE-FNC41	MKE-NAV20-41-3-4.5	3	4.5	10/15/2020	**0.026**	0.0066 U	0.003 U	0.0022 U	0.012 U	0.0032 U	0.0034 U	0.0048 U	0.0023 U	**0.026**	**0.53**	0.017 U	0.013 U	0.013 U	0.013 UJ	**0.042 J**	**0.032 J**	**0.076 J**	0.017 U	**0.02 J**	**0.022 J**	**0.036 J**	0.017 UJ	**0.095**	0.018 U	**0.037 J**
MKE-FNC42	MKE-NAV20-42-0-1	0	1	10/9/2020	0.009 U	0.01 U	0.0046 U	0.0034 U	0.018 U	0.0048 U	0.0052 U	0.0073 U	0.0035 U	0.0032 U	**1.2**	0.032 U	0.025 U	0.024 U	0.024 U	**0.11 J+**	**0.1**	**0.23 J**	**0.045 J**	**0.065 J**	**0.049 J**	**0.084**	0.032 U	**0.16 J+**	0.035 U	**0.1 J+**
MKE-FNC42	MKE-NAV20-42-1-3	1	3	10/9/2020	**0.016**	0.0081 U	0.0037 U	0.0028 U	0.015 U	0.0039 U	0.0042 U	0.0059 U	0.0029 U	**0.016**	**0.3**	0.0051 U	0.004 U	0.0039 U	0.0039 U	**0.025 J+**	**0.024**	**0.055 J**	**0.0099 J**	**0.015**	**0.014**	**0.02**	0.0051 U	**0.046 J+**	0.0056 U	**0.028 J+**
MKE-FNC42	MKE-NAV20-42-3-5	3	5	10/9/2020	**0.024**	0.0083 U	0.0038 U	0.0028 U	0.015 U	0.004 U	0.0043 U	0.0061 U	0.0029 U	**0.024**	**0.46**	0.0052 U	0.0041 U	0.004 U	**0.0079 J**	**0.044 J+**	**0.037**	**0.065 J**	**0.015**	**0.022**	**0.02**	**0.033**	0.0052 U	**0.072 J+**	0.0057 U	**0.042 J+**
MKE-FNC42	MKE-NAV20-42-5-7	5	7	10/9/2020	**0.019**	0.0052 U	0.0024 U	0.0018 U	0.0095 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	**0.019**	**1.2**	0.017 U	0.013 U	**0.014 J**	**0.024 J**	**0.12 J+**	**0.097**	**0.2 J**	**0.035 J**	**0.05**	**0.046**	**0.081**	0.017 U	**0.18 J+**	0.018 U	**0.087**
MKE-FNC42	MKE-NAV20-42-7-9	7	9	10/9/2020	0.0045 U	0.005 U	0.0023 U	0.0017 U	0.009 U	0.0024 U	0.0026 U	0.0036 U	0.0017 U	0.0016 U	**0.02**	0.00063 U	0.00049 U	0.00048 U	0.00048 U	**0.0019 J+**	**0.0015 J**	**0.0033 J**	0.00063 U	**0.00082 J**	**0.00076 J**	**0.0013 J**	0.00063 U	**0.0028 J+**	0.00069 U	**0.0014 J**
MKE-FNC42	MKE-NAV20-42-9-11	9	11	10/9/2020	0.0048 U	0.0052 U	0.0024 U	0.0018 U	0.0095 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	0.0017 U	0.00039 U	0.00066 U	0.00052 U	0.00051 U	0.00051 U	0.00052 U	0.00066 U	0.00052 UJ	0.00066 U	0.00066 U	0.00073 U	0.00052 U	0.00066 U	0.00078 U	0.00073 U	0.00066 U
MKE-FNC42	MKE-NAV20-42-11-12.5	11	12.5	10/9/2020	0.0048 U	0.0052 U	0.0024 U	0.0018 U	0.0095 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	0.0017 U	0.00039 U	0.00066 U	0.00052 U	0.00051 U	0.00051 U	0.00052 U	0.00066 U	0.00052 UJ	0.00066 U	0.00066 U	0.00073 U	0.00052 U	0.00066 U	0.00078 U	0.00073 U	0.00066 U
MKE-FNC43	MKE-NAV20-43-0-1	0	1	10/15/2020	0.013 U	0.014 U	0.0065 U	0.0048 U	0.026 U	0.0069 U	0.0073 U	0.01 U	0.005 U	0.0046 U	**0.58**	0.036 U	0.028 U	0.027 U	0.027 UJ	**0.04 J**	0.036 U	**0.097 J**	0.036 U	0.036 UJ	0.039 U	**0.039 J**	0.036 UJ	**0.086 J**	0.039 U	**0.047 J**
MKE-FNC43	MKE-NAV20-43-1-3	1	3	10/15/2020	**0.027**	0.0089 U	0.0041 U	0.003 U	0.016 U	0.0043 U	0.0046 U	0.0065 U	0.0031 U	**0.027**	**0.45**	0.022 U	0.018 U	0.017 U	0.017 UJ	**0.033 J**	**0.026 J**	**0.071 J**	0.022 U	0.022 UJ	0.025 U	**0.031 J**	0.022 UJ	**0.075**	0.025 U	**0.033 J**
MKE-FNC43	MKE-NAV20-43-3-5	3	5	10/15/2020	**0.032**	0.0063 U	0.0029 U	0.0021 U	0.011 U	0.003 U	0.0032 U	0.0046 U	0.0022 U	**0.032**	**0.8**	0.02 U	0.016 U	0.015 U	0.015 UJ	**0.066 J+**	**0.049 J**	**0.12 J**	**0.024 J**	**0.03 J**	**0.033 J**	**0.054 J-**	0.02 UJ	**0.14**	0.022 U	**0.054 J-**
MKE-FNC43	MKE-NAV20-43-5-7.2	5	7.2	10/15/2020	0.0048 U	0.0053 U	0.0024 U	0.0018 U	0.0096 U	0.0025 U	0.0027 U	0.0039 U	0.0019 U	0.0017 U	**0.0086**	0.00067 U	0.00052 U	0.00051 U	0.00051 UJ	0.00052 U	0.00067 U	**0.0011 J**	0.00067 U	0.00067 UJ	0.00073 U	0.00052 UJ	0.00067 UJ	**0.0011 J**	0.00073 U	0.00067 UJ
MKE-FNC44	MKE-NAV20-44-0-1	0	1	10/15/2020	0.005 U	0.0057 U	0.0026 U	0.0019 U	0.01 U	0.0027 U	0.0029 U	0.0041 U	0.002 U	0.0018 U	**0.067**	0.0014 U	0.0011 U	0.0011 U	0.0011 UJ	**0.0051 J+**	**0.0043 J**	**0.011 J**	**0.0021 J**	**0.003 J**	**0.0033 J**	**0.0045 J-**	0.0014 UJ	**0.011**	0.0016 U	**0.0052 J-**
MKE-FNC44	MKE-NAV20-44-1-3	1	3	10/15/2020	0.0048 U	0.0053 U	0.0024 U	0.0018 U	0.0095 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	0.0017 U	0.00039 U	0.00066 U	0.00052 U	0.00051 U	0.00051 UJ	0.00052 U	0.00066 U	0.00052 UJ	0.00066 U	0.00066 UJ	0.00073 U	0.00052 UJ	0.00066 UJ	0.00078 U	0.00073 U	0.00066 UJ
MKE-FNC44	MKE-NAV20-44-3-4.5	3	4.5	10/15/2020	0.0055 U	0.0059 U	0.0027 U	0.002 U	0.011 U	0.0029 U	0.0031 U	0.0043 U	0.0021 U	0.0019 U	0.0009 U	0.0015 U	0.0012 U	0.0011 U	0.0011 UJ	0.0012 U	0.0015 U	0.0012 UJ	0.0015 U	0.0015 UJ	0.0016 U	0.0012 UJ	0.0015 UJ	0.0018 U	0.0016 U	0.0015 UJ
MKE-FNC45	MKE-NAV20-45-0-1	0	1	10/15/2020	0.011 U	0.012 U	0.0056 U	0.0042 U	0.022 U	0.0059 U	0.0063 U	0.009 U	0.0043 U	0.004 U	**0.99**	0.039 U	0.03 U	0.03 U	0.03 U	**0.069 J**	**0.061 J**	**0.17 J**	0.039 U	**0.046 J**	**0.046 J**	**0.065 J**	0.039 U	**0.15**	0.042 U	**0.085 J**
MKE-FNC45	MKE-NAV20-45-1-3	1	3	10/15/2020	**0.014 J**	0.0091 U	0.0042 U	0.0031 U	0.016 U	0.0044 U	0.0047 U	0.0066 U	0.0032 U	**0.014 J**	**0.65**	0.029 U	0.022 U	0.022 U	0.022 U	**0.047 J**	**0.038 J**	**0.11 J**	0.029 UJ	0.029 UJ	0.031 UJ	**0.042 J**	0.029 U	**0.11 J**	0.031 U	**0.048 J**
MKE-FNC45	MKE-NAV20-45-3-5	3	5	10/15/2020	**0.014 J**	0.0092 U	0.0042 U	0.0031 U	0.017 U	0.0044 U	0.0047 U	0.0067 U	0.0032 U	**0.014 J**	**0.31**	0.012 U	0.0091 U	0.0089 U	0.0089 U	**0.024 J**	**0.018 J**	**0.047 J**	0.012 U	**0.012 J**	0.013 U	**0.02 J**	0.012 U	**0.054**	0.013 U	**0.023 J**
MKE-FNC45	MKE-NAV20-45-5-7	5	7	10/15/2020	**0.016**	0.0056 U	0.0026 U	0.0019 U	0.01 U	0.0027 U	0.0029 U	0.0041 U	0.002 U	**0.016**	**0.11**	0.0035 U	0.0028 U	0.0027 U	0.0027 U	**0.0086 J**	**0.0065 J**	**0.017 J**	0.0035 U	**0.0044 J**	**0.0048 J**	**0.0073 J**	0.0035 U	**0.019**	0.0039 U	**0.008 J**
MKE-FNC45	MKE-NAV20-45-7-9	7	9	10/15/2020	0.0048 U	0.0053 U	0.0024 U	0.0018 U	0.0096 U	0.0026 U	0.0027 U	0.0039 U	0.0019 U	0.0017 U	**0.0093**	0.00067 U	0.00052 U	0.00051 U	0.00051 U	**0.00061 J**	0.00067 U	**0.0014 J**	0.00067 U	0.00067 U	0.00073 U	**0.00055 J**	0.00067 U	**0.0013 J**	0.00073 U	0.00067 U
MKE-FNC45	MKE-NAV20-45-9-11.4	9	11.4	10/15/2020	0.005 U	0.0055 U	0.0025 U	0.0019 U	0.01 U	0.0027 U	0.0028 U	0.004 U	0.0019 U	0.0018 U	**0.0077**	0.0007 U	0.00055 U	0.00053 U	0.00053 U	0.00055 U	0.0007 U	**0.0011 J**	0.0007 U	0.0007 U	0.00076 U	0.00055 U	0.0007 U	**0.00096 J**	0.00076 U	0.0007 U
MKE-FNC46	MKE-NAV20-46-0-1	0	1	10/14/2020	0.009 U	0.0099 U	0.0045 U	0.0034 U	0.018 U	0.0048 U	0.0051 U	0.0072 U	0.0035 U	0.0032 U	**0.63**	0.025 U	0.02 U	0.019 U	0.019 U	**0.05 J**	**0.038 J**	**0.11 J**	0.025 U	**0.026 J**	**0.029 J**	**0.048 J**	0.025 UJ	**0.091 J+**	0.028 U	**0.042 J**
MKE-FNC46	MKE-NAV20-46-1-3	1	3	10/14/2020	0.006 U	0.0064 U	0.0029 U	0.0022 U	0.012 U	0.0031 U	0.0033 U	0.0047 U	0.0022 U	0.0021 U	**0.39**	0.0081 U	0.0063 U	0.0062 U	0.0062 U	**0.031 J+**	**0.025**	**0.066 J**	**0.012 J**	**0.016 J**	**0.016 J**	**0.026**	0.0081 UJ	**0.067 J+**	0.0089 U	**0.03**
MKE-FNC46	MKE-NAV20-46-3-5	3	5	10/14/2020	0.0055 U	0.0061 U	0.0028 U	0.0021 U	0.011 U	0.0029 U	0.0031 U	0.0044 U	0.0021 U	0.0019 U	**0.11**	0.0038 U	0.003 U	0.0029 U	0.0029 U	**0.0083 J**	**0.0065 J**	**0.018 J**	0.0038 U	**0.0039 J**	**0.0046 J**	**0.0068 J**	0.0038 UJ	**0.018 J+**	0.0042 U	**0.0073 J**
MKE-FNC46	MKE-NAV20-46-5-7	5	7	10/14/2020	0.0047 U	0.0051 U	0.0023 U	0.0017 U	0.0093 U	0.0025 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	**0.16**	0.0065 U	0.0051 U	0.0049 U	0.0049 U	**0.013 J**	**0.0082 J**	**0.018 J**	0.0065 U	0.0065 U	0.0071 U	**0.0096 J**	0.0065 UJ	**0.032 J+**	0.0071 U	**0.0084 J**
MKE-FNC46	MKE-NAV20-46-7-9.2	7	9.2	10/14/2020	0.0048 U	0.0053 U	0.0024 U	0.0018 U	0.0095 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	0.0017 U	**0.0068**	0.00066 U	0.00052 U	0.00051 U	0.00051 U	0.00052 U	0.00066 U	**0.00075 J**	0.00066 U	0.00066 U	0.00073 U	0.00052 U	0.00066 UJ	**0.00083 J**	0.00073 U	0.00066 U
MKE-FNC47	MKE-NAV20-47-0-1	0	1	10/14/2020	0.009 U	0.0099 U	0.0045 U	0.0034 U	0.018 U	0.0048 U	0.0051 U	0.0072 U	0.0035 U	0.0032 U	**0.68**	0.031 U	0.025 U	0.024 U	0.024 U	**0.048 J**	**0.042 J**	**0.11 J**	0.031 U	0.031 U	0.034 U	**0.047 J**	0.031 UJ	**0.11**	0.034 U	**0.044 J**
MKE-FNC47	MKE-NAV20-47-1-3	1	3	10/14/2020	**0.035**	0.0083 U	0.0038 U	0.0028 U	0.015 U	0.004 U	0.0043 U	0.0061 U	0.0029 U	**0.035**	**0.78**	0.021 U	0.016 U	0.016 U	0.016 U	**0.06 J+**	**0.048 J**	**0.12 J**	**0.024 J**	**0.029 J**	**0.032 J**	**0.054**	0.021 U	**0.13**	0.023 U	**0.053 J**
MKE-FNC47	MKE-NAV20-47-3-5	3	5	10/14/2020	0.0046 U	0.0051 U	0.0023 U	0.0017 U	0.0092 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	**0.059**	0.00064 U	**0.03**	0.00049 U	0.00049 U	**0.0018 J+**	**0.0013 J**	**0.0033 J**	0.00064 U	**0.00088 J**	**0.00088 J**	**0.0013 J**	0.00064 U	**0.0038**	**0.0075 J**	**0.0016**
MKE-FNC47	MKE-NAV20-47-5-7	5	7	10/14/2020	0.0045 U	0.005 U	0.0023 U	0.0017 U	0.009 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	**0.014**	0.00063 U	**0.0013 J**	0.00048 U	0.00048 U	**0.001 J**	**0.00084 J**	**0.0021 J**	0.00063 U	0.00063 U	0.00069 U	**0.00086 J**	0.00063 U	**0.0021**	0.00069 U	**0.00084 J**
MKE-FNC47	MKE-NAV20-47-7-9	7	9	10/14/2020	0.0047 U	0.0052 U	0.0024 U	0.0018 U	0.0094 U	0.0025 U	0.0027 U	0.0038 U	0.0018 U	0.0017 U	**0.0057**	0.00065 U	**0.00053 J**	0.0005 U	0.0005 U	0.00051 U	0.00065 U	0.00051 UJ	0.00065 U	0.00065 U	0.00072 U	0.00051 U	0.00065 U	0.00077 U	0.00072 U	0.00065 U
MKE-FNC48	MKE-NAV20-48-0-1	0	1	10/14/2020	0.0065 U	0.0073 U	0.0033 U	0.0025 U	0.013 U	0.0035 U	0.0038 U	0.0053 U	0.0026 U	0.0024 U	0.0011 U	0.0018 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0018 U	0.0014 UJ	0.0018 U	0.0018 U	0.002 U	0.0014 U	0.0018 UJ	0.0022 U	0.002 U	0.0018 U
MKE-FNC48	MKE-NAV20-48-1-3	1	3	10/14/2020	0.0044 U	0.0049 U	0.0022 U	0.0016 U	0.0088 U	0.0023 U	0.0025 U	0.0035 U	0.0017 U	0.0016 U	**0.011**	0.0012 U	0.00096 U	0.00094 U	0.00094 U	0.00096 U	0.0012 U	**0.0011 J**	0.0012 U	0.0012 U	0.0013 U	0.00096 U	0.0012 UJ	0.0014 U	0.0013 U	0.0012 U
MKE-FNC48	MKE-NAV20-48-3-5	3	5	10/14/2020	0.0046 U	0.0051 U	0.0023 U	0.0017 U	0.0092 U	0.0024 U	0.0026 U	0.0037 U	0.0018 U	0.0016 U	0.00038 U	0.00064 U	0.0005 U	0.00049 U	0.00049 U	0.0005 U	0.00064 U	0.0005 UJ	0.00064 U	0.00064 U	0.0007 U	0.0005 U	0.00064 UJ	0.00075 U	0.0007 U	0.00064 U
MKE-FNC48	MKE-NAV20-48-5-6.3	5	6.3	10/14/2020	0.0045 U	0.005 U	0.0023 U	0.0017 U	0.009 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	0.00037 U	0.00063 U	0.00049 U	0.00048 U	0.00048 U	0.00049 U	0.00063 U	0.00049 UJ	0.00063 U	0.00063 U	0.00069 U	0.00049 U	0.00063 UJ	0.00074 U	0.00069 U	0.00063 U
MKE-FNC49	MKE-NAV20-49-0-1	0	1	10/15/2020	0.0085 U	0.0096 U	0.0044 U	0.0033 U	0.017 U	0.0046 U	0.005 U	0.007 U	0.0034 U	0.0031 U	**0.32**	0.024 U	0.019 U	0.019 U	0.019 U	**0.021 J**	0.024 U	**0.046 J**	0.024 U	0.024 U	0.027 U	**0.019 J**	0.024 U	**0.049 J**	0.027 U	0.024 U
MKE-FNC49	MKE-NAV20-49-1-3	1	3	10/15/2020	**0.034**	0.0087 U	0.004 U	0.0029 U	0.016 U	0.0042 U	0.0045 U	0.0063 U	0.003 U	**0.034**	**0.68**	0.027 U	0.021 U	0.021 U	0.021 U	**0.054 J**	**0.039 J**	**0.11 J**	0.027 U	0.027 U	0.03 U	**0.044 J**	0.027 U	**0.12**	0.03 U	**0.043 J**
MKE-FNC49	MKE-NAV20-49-3-5	3	5	10/15/2020	**0.054**	0.008 U	0.0037 U	0.0027 U	0.015 U	0.0039 U	0.0041 U	0.0058 U	0.0028 U	**0.054**	**2.3**	0.051 U	0.04 U	0.039 U	0.039 U	**0.19 J**	**0.13 J**	**0.35 J**	**0.061 J**	**0.073 J**	**0.087 J**	**0.15 J**	0.051 U	**0.45 J**	0.055 U	**0.14 J**
MKE-FNC49	MKE-NAV20-49-5-7	5	7	10/15/2020	**0.15**	0.0072 U	0.0033 U	0.0024 U	0.013 U	0.0035 U	0.0037 U	0.0053 U	0.0025 U	**0.15**	**1.2**	0.023 U	0.018 U	0.017 U	**0.018 J**	**0.1 J+**	**0.075**	**0.18 J**	**0.032 J**	**0.037 J**	**0.051 J**	**0.08**	0.023 U	**0.24**	0.025 U	**0.071**
MKE-FNC49	MKE-NAV20-49-7-9	7	9	10/15/2020	0.0045 U	0.0049 U	0.0023 U	0.0017 U	0.0089 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	0.00037 U	0.00062 U	0.00049 U	0.00048 U	0.00048 UJ	0.00049 U	0.00062 U	0.00049 UJ	0.00062 U	0.00062 UJ	0.00068 U	0.00049 UJ	0.00062 U	0.00073 U	0.00068 U	0.00062 UJ
MKE-FNC50	MKE-NAV20-50-0-1	0	1	10/14/2020	**0.017 J**	0.011 U	0.005 U	0.0037 U	0.02 U	0.0053 U	0.0056 U	0.0079 U	0.0038 U	**0.017 J**	**1.4**	0.034 U	0.027 U	0.026 U	0.026 U	**0.099 J+**	**0.087**	**0.22 J**	**0.046 J**	**0.065 J**	**0.069 J**	**0.094**	0.034 UJ	**0.23 J+**	0.038 U	**0.11**
MKE-FNC50	MKE-NAV20-50-1-3	1	3	10/14/2020	0.007 U	0.0077 U	0.0035 U	0.0026 U	0.014 U	0.0037 U	0.0039 U	0.0056 U	0.0027 U	0.0025 U	**0.33**	0.019 U	0.015 U	0.015 U	0.015 U	**0.027 J**	0.019 U	**0.041 J**	0.019 U	0.019 U	0.021 U	**0.024 J**	0.019 UJ	**0.053 J+**	0.021 U	0.019 U
MKE-FNC50	MKE-NAV20-50-3-5	3	5	10/14/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.0049 U	0.0024 U	0.0022 U	**0.038**	0.0017 U	0.0013 U	0.0013 U	0.0013 U	**0.0031 J**	**0.0019 J**	**0.0053 J**	0.0017 U	0.0017 U	0.0019 U	**0.0024 J**	0.0017 UJ	**0.0066 J+**	0.0019 U	**0.0025 J**
MKE-FNC50	MKE-NAV20-50-5-7	5	7	10/14/2020	0.006 U	0.0068 U	0.0031 U	0.0023 U	0.012 U	0.0033 U	0.0035 U	0.005 U	0.0024 U	0.0022 U	**0.038**	0.0043 U	0.0034 U	0.0033 U	0.0033 U	0.0034 U	0.0043 U	**0.0043 J**	0.0043 U	0.0043 U	0.0047 U	0.0034 U	0.0043 UJ	0.0051 U	0.0047 U	0.0043 U
MKE-FNC50	MKE-NAV20-50-7-9	7	9	10/14/2020	0.0045 U	0.0049 U	0.0022 U	0.0017 U	0.0089 U	0.0024 U	0.0025 U	0.0036 U	0.0017 U	0.0016 U	0.00037 U	0.00062 U	0.00048 U	0.00047 U	0.00047 U	0.00048 U	0.00062 U	0.00048 UJ	0.00062 U	0.00062 U	0.00068 U	0.00048 U	0.00062 UJ	0.00073 U	0.00068 U	0.00062 U
KKM-21-001	KKM-21-001-210816	0	0.1	8/16/2021	0.0021 U	0.0033 U	0.0035 U	0.0015 U	0.0041 U	0.0028 U	0.0028 U	0.0037 U	0.0041 U	0.0017 U	**73.1**	0.17 U	**0.7**	**0.19 J**	**0.97**	**5.1**	**4.4**	**6.6**	**3.5**	**3.5**	**2.2**	**5.9**	**0.82**	**13**	**0.84**	**3.1**
KKM-21-001	KKM-21-001-G-210816	0	0.1	8/16/2021																										
KKM-21-003	KKM-21-003-210816	0	0.1	8/16/2021	0.003 U	0.0049 U	0.0051 U	0.0023 U	0.006 U	0.0042 U	0.004 U	0.0056 U	0.006 U	0.0025 U	**36.9**	0.083 U	**0.18 J**	**0.11 J**	**0.58**	**2.6**	**2.6**	**4.3**	**2.2**	**2.5**	**1.3**	**3.8**	**0.44**	**5.7**	**0.25 J**	**2.3**
KKM-21-004	KKM-21-004-210816	0	0.1

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals																						Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100				25														
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300				75														
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500				125														
TSCA																																							
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
MKE-FNC39	MKE-NAV20-39-0-1	0	1	10/13/2020	0.0089 U	**0.016 J**	**0.042 J+**	**40**	**0.13**	**35**	**12**	**2.7**	**0.87**	**27**	**130**	**0.27 J**	**67**	**1.9**		**12000**	**360**											**42000 J**									
MKE-FNC39	MKE-NAV20-39-1-3	1	3	10/13/2020	0.011 U	**0.053 J+**	**0.12 J+**	**170**	**0.18**	**81**	**14**	**3.4**	**2.5**	**29**	**140**	**0.98**	**60**	**1.7**		**11000**	**340**											**19000 J**									
MKE-FNC39	MKE-NAV20-39-3-5	3	5	10/13/2020	0.012 U	**0.04 J+**	**0.087 J+**	**26**	0.012 U	**25**	**13**	**1.9**	**0.45**	**13**	**49**	**0.17 J**	**31**	**1.6**		**13000**	**440**											**10000 J**									
MKE-FNC39	MKE-NAV20-39-5-5.9	5	5.9	10/13/2020	0.00049 U	**0.0053 J+**	**0.0051 J+**	**10**	0.018 U	**6.6**	**10**	**1.1**	0.1 U	**11**	**36**	0.17 U	**18**	**1.5**		**11000**	**430**											**4600 J**									
MKE-FNC40	MKE-NAV20-40-0-1	0	1	10/9/2020	0.025 U	**0.036 J**	**0.098 J+**	**81**	**0.18**	**65**	**18**	**4.6**	**1.7**	**54**	**220**	**0.59**	**98**	**2.3**		**19000**	**570**											**62000**			**0**	**1.2**	**12.9**	**59.3**	**26.6**	
MKE-FNC40	MKE-NAV20-40-1-3	1	3	10/9/2020	0.016 U	0.016 U	**0.04 J**	**25**	**0.29**	**24**	**12**	**2.2**	**0.54**	**14**	**56**	0.17 U	**68**	**1.8**		**13000**	**500**											**50000**			**0**	**0.6**	**13.2**	**54.9**	**31.3**	
MKE-FNC40	MKE-NAV20-40-3-5	3	5	10/9/2020	0.017 U	0.017 UJ	**0.04 J**	**23 J**	**0.33**	**16 J**	**19**	**1.6 J**	**0.16 J**	**14 J**	**42 J**	0.16 U	**64**	**2.4**		**21000**	**520**											**53000**			**0**	**1.3**	**15.3**	**54.1**	**29.3**	
MKE-FNC40	MKE-NAV20-40-5-7	5	7	10/9/2020	0.003 U	**0.01 J+**	**0.025 J+**	**170**	**0.077**	**54**	**9.5**	**6.5**	**1.2**	**21**	**94**	**0.55**	**61**	**1.3**		**12000**	**450**											**31000**			**3.1**	**16.1**	**42.6**	**28.2**	**7.4**	
MKE-FNC40	MKE-NAV20-40-7-9	7	9	10/9/2020	0.00051 U	**0.00072 J**	**0.0014 J**	**21**	0.014 U	**10**	**17**	**2.4**	**0.15 J**	**14**	**48**	0.15 U	**57**	**2.1**		**22000**	**640**											**6400**			**0**	**0.2**	**0.8**	**51.8**	**47.2**	
MKE-FNC40	MKE-NAV20-40-9-11.3	9	11.3	10/9/2020	0.00048 U	0.00048 U	**0.00069 J**	**11**	0.013 U	**7.7**	**12**	**1.2**	**0.14 J**	**12**	**38**	0.15 U	**30**	**1.7**		**14000**	**510**											**4600**			**0**	**0.4**	**7.3**	**78.1**	**14.2**	
MKE-FNC41	MKE-NAV20-41-0-1	0	1	10/15/2020	0.015 U	**0.032 J**	**0.065 J**	**110**	**0.23**	**78**	**16**	**3.9**	**1.8**	**46**	**190**	**1.1**	**75**	**2.1**		**15000**	**420**											**35000**									
MKE-FNC41	MKE-NAV20-41-1-3	1	3	10/15/2020	0.019 U	**0.052 J**	**0.13**	**400**	**0.29**	**130**	**20**	**5.4**	**3.5**	**73**	**300**	**2**	**86**	**2.1**		**17000**	**420**											**46000**									
MKE-FNC41	MKE-NAV20-41-3-4.5	3	4.5	10/15/2020	0.013 U	**0.034 J**	**0.078**	**300**	**0.25**	**140**	**16**	**4**	**3.4**	**47**	**200**	**1.6**	**63**	**1.6**		**13000**	**340**											**25000**									
MKE-FNC42	MKE-NAV20-42-0-1	0	1	10/9/2020	0.025 U	**0.044 J**	**0.13 J+**	**63**	**0.16**	**60**	**16**	**4**	**1.5**	**50**	**210**	**0.46 J**	**95**	**2.5**		**19000**	**540**											**60000**									
MKE-FNC42	MKE-NAV20-42-1-3	1	3	10/9/2020	0.004 U	**0.013 J+**	**0.039 J+**	**180**	**0.3**	**92**	**15**	**4.2**	**2.3**	**56**	**220**	**1.1**	**77**	**1.9**		**15000**	**440**											**41000**									
MKE-FNC42	MKE-NAV20-42-3-5	3	5	10/9/2020	0.0041 U	**0.031 J+**	**0.058 J+**	**330**	**0.3**	**120**	**20**	**5.4**	**3.2**	**66**	**280**	**1.6**	**96**	**2.4**		**19000**	**460**											**49000**									
MKE-FNC42	MKE-NAV20-42-5-7	5	7	10/9/2020	0.013 U	**0.064 J+**	**0.15 J+**	**77**	**0.091**	**38**	**8.1**	**2.6**	**1.4**	**16**	**79**	**0.58**	**27**	**0.95**		**7900**	**240**											**8100**									
MKE-FNC42	MKE-NAV20-42-7-9	7	9	10/9/2020	0.00049 U	**0.0011 J**	**0.0024 J+**	**14**	0.017 U	**7**	**12**	**2.1**	**0.19 J**	**11**	**39**	0.16 U	**26**	**1.7**		**14000**	**570**											**3700**									
MKE-FNC42	MKE-NAV20-42-9-11	9	11	10/9/2020	0.00052 U	0.00052 U	0.00066 U	**24**	**0.021 J**	**11**	**19**	**3.6**	**0.31**	**15**	**60**	0.14 U	**62**	**2.3**		**27000**	**770**											**5800**									
MKE-FNC42	MKE-NAV20-42-11-12.5	11	12.5	10/9/2020	0.00052 U	0.00052 U	0.00066 U	**20**	**0.018 J**	**11**	**20**	**2.3**	**0.22**	**16**	**56**	0.18 U	**61**	**2.2**		**23000**	**790**											**7900**									
MKE-FNC43	MKE-NAV20-43-0-1	0	1	10/15/2020	0.028 U	0.028 UJ	**0.072 J**	**51**	**0.14**	**50**	**17**	**4.3**	**1.3**	**43**	**200**	**0.39 J**	**100**	**2.4**		**20000**	**660**											**82000**									
MKE-FNC43	MKE-NAV20-43-1-3	1	3	10/15/2020	0.018 U	**0.022 J**	**0.059**	**69**	**0.18**	**59**	**13**	**3.3**	**1.2**	**39**	**160**	**0.51**	**68**	**1.9**		**18000**	**420**											**61000**									
MKE-FNC43	MKE-NAV20-43-3-5	3	5	10/15/2020	0.016 U	**0.051 J-**	**0.12**	**83**	**0.13**	**48**	**8.7**	**2.5**	**1**	**21**	**90**	**0.48**	**36**	**1.1**		**9200**	**250**											**21000**									
MKE-FNC43	MKE-NAV20-43-5-7.2	5	7.2	10/15/2020	0.00052 U	**0.00056 J**	**0.0015 J**	**17**	0.018 U	**9.9**	**18**	**4.4**	**0.3**	**17**	**58**	0.17 U	**42**	**2**		**20000**	**570**											**5900**									
MKE-FNC44	MKE-NAV20-44-0-1	0	1	10/15/2020	0.0011 U	**0.0034 J**	**0.0094**	**27**	**0.033 J**	**16**	**6.3**	**1.5**	**0.34**	**9.2**	**44**	0.15 U	**20**	**1**		**7800**	**230**											**9500**									
MKE-FNC44	MKE-NAV20-44-1-3	1	3	10/15/2020	0.00052 U	0.00052 UJ	0.00066 U	**9.4**	0.016 U	**6**	**9.3**	**2**	**0.16 J**	**9.9**	**36**	0.13 U	**25**	**1.4**		**9700**	**360**											**9000**									
MKE-FNC44	MKE-NAV20-44-3-4.5	3	4.5	10/15/2020	0.0012 U	0.0012 UJ	0.0015 U	**25**	0.02 U	**11**	**21**	**3.2**	**0.27**	**16**	**68**	0.17 U	**77**	**2.5**		**30000**	**940**											**18000**									
MKE-FNC45	MKE-NAV20-45-0-1	0	1	10/15/2020	0.03 U	**0.041 J**	**0.12 J+**	**49**	**0.16**	**50**	**16**	**4**	**1.2**	**43**	**200**	**0.47**	**100**	**2.4**		**19000**	**640**											**76000**			**0**	**2.4**	**4.6**	**59.5**	**33.5**	
MKE-FNC45	MKE-NAV20-45-1-3	1	3	10/15/2020	0.022 U	**0.037 J**	**0.085 J**	**100**	**0.22**	**92**	**19**	**4.9**	**2**	**68**	**260**	**1**	**93**	**2.4**		**19000**	**530**											**60000**			**0**	**1.1**	**13.1**	**57.8**	**28**	
MKE-FNC45	MKE-NAV20-45-3-5	3	5	10/15/2020	0.0091 U	**0.019 J**	**0.044 J+**	**310**	**0.34**	**110**	**21**	**5.5**	**2.9**	**66**	**280**	**1.6**	**110**	**2.4**		**20000**	**520**											**61000**			**0**	**1**	**7.8**	**60**	**31.2**	
MKE-FNC45	MKE-NAV20-45-5-7	5	7	10/15/2020	0.0028 U	**0.0066 J**	**0.016 J+**	**79**	**0.071**	**36**	**8.2**	**2.9**	**0.88**	**16**	**73**	**0.39**	**26**	**1.1**		**10000**	**230**											**12000**			**0**	**2.4**	**55.7**	**33.8**	**8.1**	
MKE-FNC45	MKE-NAV20-45-7-9	7	9	10/15/2020	0.00052 U	**0.00054 J**	**0.0011 J**	**17**	**0.017 J**	**8.3**	**16**	**2.6**	**0.17 J**	**13**	**48**	0.16 U	**47**	**1.9**		**18000**	**700**											**5400**			**0**	**0.1**	**13.5**	**47.9**	**38.5**	
MKE-FNC45	MKE-NAV20-45-9-11.4	9	11.4	10/15/2020	0.00055 U	0.00055 U	**0.00083 J**	**23**	**0.026 J**	**10**	**21**	**2.1**	**0.2**	**14**	**53**	0.14 U	**69**	**2.4**		**29000**	**1600**											**12000**			**0**	**0**	**0.2**	**42.9**	**56.9**	
MKE-FNC46	MKE-NAV20-46-0-1	0	1	10/14/2020	0.02 U	**0.03 J**	**0.075 J+**	**67**	**0.13**	**43**	**15**	**3.5**	**1.2**	**34**	**140**	**0.48**	**83 J**	**2.1**		**14000**	**550**											**48000 J**									
MKE-FNC46	MKE-NAV20-46-1-3	1	3	10/14/2020	0.0063 U	**0.023 J+**	**0.056 J+**	**120**	**0.14**	**66**	**13**	**3**	**1.4**	**33**	**150**	**0.83**	**59 J**	**1.8**		**13000**	**260**											**22000 J**									
MKE-FNC46	MKE-NAV20-46-3-5	3	5	10/14/2020	0.003 U	**0.007 J**	**0.015 J+**	**76**	**0.029 J**	**38**	**10**	**2.5**	**0.81**	**20**	**100**	**0.42 J**	**59 J**	**1.7**		**11000**	**290**											**31000 J**									
MKE-FNC46	MKE-NAV20-46-5-7	5	7	10/14/2020	0.0051 U	**0.013 J**	**0.024 J+**	**11**	0.019 U	**5.4**	**9.1**	**2.2**	**0.16 J**	**11**	**33**	0.14 U	**15 J**	**1.4**		**9500**	**270**											**5400 J**									
MKE-FNC46	MKE-NAV20-46-7-9.2	7	9.2	10/14/2020	0.00052 U	0.00052 U	**0.00071 J**	**21**	0.016 U	**10**	**18**	**4.9**	**0.22**	**14**	**57**	0.16 U	**49 J**	**2.4**		**16000**	**590**											**8200 J**									
MKE-FNC47	MKE-NAV20-47-0-1	0	1	10/14/2020	0.025 U	**0.042 J**	**0.09 J+**	**61**	**0.19**	**67**	**16**	**4.3**	**1.5**	**59**	**220**	**0.58**	**100 J**	**2.5**		**17000**	**640**											**66000**									
MKE-FNC47	MKE-NAV20-47-1-3	1	3	10/14/2020	0.016 U	**0.054**	**0.11 J+**	**250**	**0.46**	**130**	**21**	**5.5**	**2.8**	**68**	**300**	**2.2**	**110 J**	**2.5**		**17000**	**490**											**50000**									
MKE-FNC47	MKE-NAV20-47-3-5	3	5	10/14/2020	0.0005 U	**0.0013 J**	**0.0032 J+**	**7.4**	0.016 U	**4**	**6.1**	**1.6**	**0.1 J**	**5**	**25**	0.17 U	**11 J**	**0.99**		**5700**	**250**											**3900**									
MKE-FNC47	MKE-NAV20-47-5-7	5	7	10/14/2020	0.00049 U	**0.00079 J**	**0.0017 J+**	**8.6**	0.013 U	**4.4**	**7.5**	**1.7**	**0.11 J**	**7.5**	**30**	0.14 U	**14 J**	**1.2**		**18000**	**220**											**4100**									
MKE-FNC47	MKE-NAV20-47-7-9	7	9	10/14/2020	0.00051 U	0.00051 U	0.00065 U	**10**	0.015 U	**5.8**	**9.9**	**1.3**	**0.15 J**	**10**	**36**	0.15 U	**23 J**	**1.7**		**8900**	**330**											**7500**									
MKE-FNC48	MKE-NAV20-48-0-1	0	1	10/14/2020	0.0014 U	0.0014 U	0.0018 U	**9.4**	0.024 U	**4.8**	**8.5**	**1.9**	**0.22**	**9.3**	**45**	0.17 U	**93 J**	**1.5**		**11000**	**500**											**46000 J**									
MKE-FNC48	MKE-NAV20-48-1-3	1	3	10/14/2020	0.00096 U	0.00096 U	0.0012 U	**5.5**	**0.014 J**	**2.9**	**4.9**	**1.2**	**0.11 J**	**2.7**	**28**	0.14 U	**11 J**	**0.97**		**5100**	**98**											**4600 J**									
MKE-FNC48	MKE-NAV20-48-3-5	3	5	10/14/2020	0.0005 U	0.0005 U	0.00064 U	**11**	**0.013 J**	**4.8**	**12**	**1.2**	**0.13 J**	**8.5**	**39**	0.15 U	**16 J**	**1.4**		**8300**	**210**											**4300 J**									
MKE-FNC48	MKE-NAV20-48-5-6.3	5	6.3	10/14/2020	0.00049 U	0.00049 U	0.00063 U	**6.8**	0.011 U	**3.2**	**6.3**	**1.1**	**0.13 J**	**5.7**	**27**	0.16 U	**10 J**	**0.98**		**4800**	**160**											**3000 J**									
MKE-FNC49	MKE-NAV20-49-0-1	0	1	10/15/2020	0.019 U	0.019 U	**0.04 J**	**100**	**0.23**	**100**	**19**	**5.3**	**2.4**	**73**	**280**	**1.2**	**110**	**2.4**		**24000**	**640**											**63000**									
MKE-FNC49	MKE-NAV20-49-1-3	1	3	10/15/2020	0.021 U	**0.043 J**	**0.097 J+**	**200**	**0.5**	**140**	**23**	**6.2**	**3.5**	**77**	**320**	**2.3**	**120**	**2.7**		**25000**	**540**											**61000**									
MKE-FNC49	MKE-NAV20-49-3-5	3	5	10/15/2020	0.04 U	**0.19 J**	**0.36 J**	**460**	**0.63**	**200**	**27**	**7.4**	**7.5**	**82**	**360**	**3.1**	**140**	**2.6**		**25000**	**540**											**59000**									
MKE-FNC49	MKE-NAV20-49-5-7	5	7	10/15/2020	0.018 U	**0.098**	**0.19 J+**	**350**	**0.39**	**170**	**22**	**6**	**5.1**	**69**	**290**	**2.4**	**110**	**2.3**		**19000**	**430**											**45000**									
MKE-FNC49	MKE-NAV20-49-7-9	7	9	10/15/2020	0.00049 U	0.00049 UJ	0.00062 U	**11**	**0.017 J**	**6.3**	**11**	**2.9**	**0.2**	**11**	**38**	0.14 U	**22**	**1.4**		**11000**	**350**											**4100**									
MKE-FNC50	MKE-NAV20-50-0-1	0	1	10/14/2020	0.027 U	**0.068 J**	**0.19 J+**	**71**	0.04 U	**67**	**18**	**4.4**	**1.6**	**54**	**210**	**0.72**	**100 J**	**2.5**		**14000**	**590**											**61000 J**			**0**	**0.6**	**9.5**	**52.5**	**37.4**	
MKE-FNC50	MKE-NAV20-50-1-3	1	3	10/14/2020	0.015 U	**0.03 J**	**0.049 J+**	**100**	0.023 U	**91**	**18**	**4.7**	**2**	**41**	**150**	**0.88**	**120 J**	**2.1**		**14000**	**570**											**43000 J**			**0**	**1.3**	**8.2**	**61.7**	**28.8**	
MKE-FNC50	MKE-NAV20-50-3-5	3	5	10/14/2020	0.0013 U	**0.0032 J**	**0.0054 J+**	**15**	0.021 U	**6.6**	**12**	**2.1**	**0.22**	**12**	**42**	0.17 U	**110 J**	**1.8**		**12000**	**680**											**40000 J**			**0**	**1**	**6.9**	**58.9**	**33.2**	
MKE-FNC50	MKE-NAV20-50-5-7	5	7	10/14/2020	0.0034 U	0.0034 U	0.0043 U	**14**	0.015 U	**6.5**	**12**	**2.1**	**0.2**	**12**	**41**	0.18 U	**110 J**	**1.8**		**14000**	**690**											**41000 J**			**0**	**1.1**	**12.8**	**57.5**	**28.6**	
MKE-FNC50	MKE-NAV20-50-7-9	7	9	10/14/2020	0.00048 U	0.00048 U	0.00062 U	**4.2**	0.012 U	**2**	**3.7**	**0.91**	0.1 U	**2.4**	**17**	0.17 U	**7.1 J**	**0.79**		**2300**	**130**											**3300 J**			**0.3**	**4.8**	**83.6**	**9.2**	**1.2**	
KKM-21-001	KKM-21-001-210816	0	0.1	8/16/2021	**0.2 J**	**10**	**12**	**50.1**	**0.13**	**63.2**	**12**	**2.1**	**0.24**	**37.8**	**131**																	**72300**									
KKM-21-001	KKM-21-001-G-210816	0	0.1	8/16/2021																												**34.7**	**57.6**	**13.9**	**25.8**	**17.9**	**6.5**	**1.3**	**7.8**
KKM-21-003	KKM-21-003-210816	0	0.1	8/16/2021	0.067 U	**2.4**	**5.6**	**33**	**0.072**	**88.7**	**19.4**	**3.9**	**1.1**	**66**	**289**																	**54500**									
KKM-21-004	KKM-21-004-210816	0	0.1	8/16/2021	0.54 U	**1.4 J**	**2.7 J**	**82.6**	**0.53**	**435**	**43.4**	**5**	**1.5**	**530**	**971**																	**111000**									
KKM-21-005	KKM-21-005-210816	0	0.1	8/16/2021	0.19 U	**0.4 J**	**0.58 J**	**24.4**	0.012 U	**23.7**	**11.8**	**2**	**0.17**	**25.6**	**94.6**																	**61200**									
KKR-20-001	KKR-20-001-C-00-01-200916	0	1	9/16/2020	0.023 U	**0.15**	**0.31**	**14**	**J- 0.017**	**8**	**15 J**	**3.2**	**0.17**	**21 J**	**56**																									
KKR-20-001	KKR-20-001-C-01-2.9-200916	1	2.9	9/16/2020	0.0074 U	0.01 U	0.009 U	**11**	**J- 0.015 J**	**10**	**15 J**	**5.4**	**0.19**	**15 J**	**62**																									
KKR-20-002	KKR-20-002-C-00-01-200916	0	1	9/16/2020	0.13 U	**1.5**	**2.5**	**12**	**J- 0.017**	**30**	**8.4 J**	**2.2**	**0.51**	**12 J**	**98**																									
KKR-20-002	KKR-20-002-C-01-03-200916	1	3	9/16/2020	**0.065 J**	**1.8**	**3.2**	**20**	**J- 0.054**	**37**	**11 J**	**4.2**	**5.2**	**27 J**	**240**																									
KKR-20-002	KKR-20-002-C-03-05-200916	3	5	9/16/2020	**1.5**	**48**	**47**	**130**	**J- 0.047**	**340**	**41 J**	**9.9**	**11**	**110 J**	**820**																									
KKR-20-002	KKR-20-002-C-05-06-200916	5	6	9/16/2020	**1.4**	**50**	**55**	**580**	**J- 0.54**	**530**	**38 J**	**16**	**120**	**280 J**	**3100**																									
KKR-20-003	KKR-20-003-C-00-01-200916	0	1	9/16/2020	**0.16 J**	**18**	**18**	**12**	**J- 0.012 J**	**31**	**7.8 J**	**2**	**0.92**	**16 J**	**100**																									
KKR-20-003	KKR-20-003-C-01-03-200916	1	3	9/16/2020	**0.037 J**	**4.8**	**7.7**	**12**	**J- 0.03**	**51**	**9.5 J**	**2.9**	**1.2**	**15 J**	**140**																									
KKR-20-003	KKR-20-003-C-03-05-200916	3	5	9/16/2020	**0.44**	**16**	**14**	**27**	**J- 0.23**	**89**	**19 J**	**4.6**	**0.96**	**44 J**	**340**																									
KKR-20-003	KKR-20-003-C-05-06-200916	5	6	9/16/2020	**0.12 J**	**7**	**6**	**28**	**J- 0.03**	**110**	**10 J**	**2.8**	**0.74**	**19 J**	**160**																									
KKR-20-004	KKR-20-004-C-00-01-200916	0	1	9/16/2020	**0.14 J**	**7.9**	**10**	**18**	**J- 0.021**	**64**	**7.9 J**	**2.2**	**0.77**	**31 J**	**93**																									
KKR-20-004	KKR-20-004-C-01-03-200916	1	3	9/16/2020	**0.049 J**	**1.7**	**3.6**	**13**	**J- 0.0095** U	**36**	**8.8 J**	**2.5**	**0.94**	**11 J**	**120**																									
KKR-20-004	KKR-20-004-C-03-05-200916	3	5	9/16/2020	**0.47 J**	**34**	**38**	**65**	**J- 0.24**	**310**	**22 J**	**6.8**	**5.3**	**58 J**	**340**																									
KKR-20-004	KKR-20-004-C-05-6.7-200916	5	6.7	9/16/2020	**1.4**	**64**	**68**	**130**	**J- 0.45**	**370**	**36 J**	**9**	**7.6**	**94 J**	**610**																									
KKR-20-005	KKR-20-005-C-00-01-200916	0	1	9/16/2020	**2.5**	**17**	**16**	**13**	**J- 0.022**	**84**	**14 J**	**5.8**	**1.1**	**22 J**	**600**																									
KKR-20-005	KKR-20-005-C-01-03-200916	1	3	9/16/2020	**0.037 J**	**7.7**	**7.6**	**16**	**J- 0.037**	**59**	**11 J**	**2.9**	**1**	**14 J**	**110**																									
KKR-20-005	KKR-20-005-C-03-5.1-200916	3	5.1	9/16/2020	**1.2**	**29**	**40**	**260**	**J- 0.58**	**500**	**54 J**	**20**	**33**	**220 J**	**1600**																									
KKR-20-006	KKR-20-006-C-00-01-200916	0	1	9/16/2020	0.067 U	**3.1**	**5.9**	**18**	**J- 0.025 J+**	**20**	**11 J**	**2.8**	**0.72**	**18 J**	**110**																									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB											PAH													
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8														
WI CBSQG PEC					3										68.4														
WI CBSQG PEC					5										114														
TSCA					50																								
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KKR-20-006	KKR-20-006-C-01-03-200916	1	3	9/16/2020	**0.33**	**0.064 J**	0.0013 UJ	0.00058 UJ	0.0015 UJ	0.0011 UJ	0.001 UJ	0.0014 UJ	0.0015 UJ	**0.27 J**	**40.8**	0.085 U	**0.38**	**0.18 J**	**1.3**	**3.7**	**3**	**3.2**	**1.7**	**1.7**	**1.6**	**3.6**	**0.79**	**7.5**	**0.39**	**1.7**
KKR-20-006	KKR-20-006-C-03-05-200916	3	5	9/16/2020	**0.49**	0.0013 UJ	**0.11 J**	0.0006 UJ	0.0016 UJ	0.0011 UJ	0.0011 UJ	0.0014 UJ	0.0016 UJ	**0.38 J**	**80**	**0.13 J**	**1.3**	**0.19 J**	**3.1**	**6.4**	**4.8**	**5.9**	**3**	**2.8**	**2.1**	**6.1**	**1**	**15**	**1.4**	**2.6**
KKR-20-006	KKR-20-006-C-05-7.2-200916	5	7.2	9/16/2020	**4.1**	**0.28 J**	0.0098 U	0.0044 U	0.012 U	0.0079 U	**3.8**	0.011 U	0.011 U	0.0048 U	**270**	**0.91 J**	**3.4**	**0.89 J**	**8.2 J**	**19**	**16**	**21**	**11**	**9.5**	**7.6**	**21**	**3.4**	**51**	**5.3**	**9.3**
KKR-20-007	KKR-20-007-C-00-1.2-200916	0	1.2	9/16/2020	**0.21**	**0.036 J**	0.0013 UJ	0.0006 UJ	0.0016 UJ	0.0011 UJ	**0.17 J**	0.0015 UJ	0.0016 UJ	0.00065 UJ	**28.9**	0.086 U	**0.36**	**0.093 J**	**1.2**	**2.5**	**2**	**2.2**	**1.2 J**	**1.1**	**0.92**	**2.4**	**0.62**	**5.1**	**0.43**	**1.1**
KKR-20-008	KKR-20-008-C-00-01-200921	0	1	9/21/2020	**57**	0.19 U	**11**	0.088 U	0.23 U	0.16 U	0.16 U	0.21 U	0.23 U	**46**	**325**	**0.84 J**	**4.7**	**0.81 J**	**7.3**	**23**	**21**	**29**	**14**	**17**	**9.5**	**27**	**3.8**	**62**	**5.7**	**14**
KKR-20-008	KKR-20-008-C-01-03-200921	1	3	9/21/2020	**42.7**	0.17 U	**8.7**	0.079 U	0.21 U	0.14 U	0.14 U	0.19 U	0.21 U	**34**	**268**	**0.76 J**	**3.2**	**1.1 J**	**7.1**	**19**	**18**	**23**	**12**	**13**	**7**	**23**	**3.9**	**52**	**4.6**	**12**
KKR-20-008	KKR-20-008-C-03-05-200921	3	5	9/21/2020	**23**	**2**	0.11 U	0.047 U	0.12 U	0.086 U	**21**	0.11 U	0.12 U	0.052 U	**398**	**1.9**	**3.9**	**2.3**	**12**	**27**	**24**	**32**	**17**	**20**	**13**	**36**	**5.9**	**78**	**6.3**	**17**
KKR-20-008	KKR-20-008-C-05-07-200921	5	7	9/21/2020	**14**	0.097 U	**14**	0.046 U	0.12 U	0.083 U	0.082 U	0.11 U	0.12 U	0.05 U	**304**	**1.2 J**	**2.3**	**1.2 J**	**6.6**	**20**	**19**	**25**	**14**	**18**	**11**	**26**	**4.3**	**62**	**3.8**	**14**
KKR-20-008	KKR-20-008-C-07-09-200921	7	9	9/21/2020	0.0012 U	0.0019 U	0.002 UJ	0.0009 UJ	0.0024 UJ	0.0016 UJ	0.0016 UJ	0.0022 UJ	0.0024 UJ	0.00098 UJ	**117**	**0.5 J**	**0.97**	**0.47 J**	**2.3**	**8**	**7.9**	**11**	**5.7**	**6.4**	**4**	**11**	**1.6**	**22**	**1.1**	**5.3**
KKR-20-008	KKR-20-008-C-09-10-200921	9	10	9/21/2020	0.0022 U	0.0035 U	0.0037 U	0.0017 U	0.0044 U	0.003 U	0.003 U	0.004 U	0.0044 U	0.0018 U	**5.8**	**0.046 J**	**0.12**	**0.031 J**	**0.17**	**0.42**	**0.38**	**0.39**	**0.23 J**	**0.27**	**0.21**	**0.51**	**0.08 J**	**0.98**	**0.075 J**	**0.25**
KKR-20-009	KKR-20-009-C-00-1.3-200921	0	1.3	9/21/2020	**0.24**	**0.023**	0.0029 U	0.0013 U	0.0034 U	0.0024 U	**0.22**	0.0032 U	0.0034 U	0.0014 U	**65.3**	0.23 U	**0.81 J**	0.21 U	**2.5**	**5.5 J**	**4.5**	**4.8 J**	**2.8 J**	**2.2**	**2.4**	**5.3**	**1.4**	**12 J**	**1**	**2.1**
KKR-20-009	KKR-20-009-G-00-1.3-200921	0	1.3	9/21/2020																										
KKR-20-009	KKR-20-009-C-1.3-03-200921	1.3	3	9/21/2020	**2.1**	**0.16**	0.0034 U	0.0015 U	0.0041 U	0.0028 U	**1.9**	0.0037 U	0.004 U	0.0017 U	**192**	**0.42 J**	**2.7**	**0.73**	**5.2**	**13**	**11**	**15**	**7.9**	**7.1**	**5.6**	**16**	**2.2**	**38**	**3.4**	**6.9**
KKR-20-009	KKR-20-009-G-1.3-03-200921	1.3	3	9/21/2020																										
KKR-20-009	KKR-20-009-C-03-05-200921	3	5	9/21/2020	**9.3**	**0.76**	0.038 U	0.017 U	0.045 U	0.031 U	**8.5**	0.041 U	0.044 U	0.018 U	**402**	**1.4**	**4.7**	**1.8**	**15**	**27**	**23**	**29**	**16**	**14**	**13**	**32**	**4.5**	**77**	**8**	**14**
KKR-20-009	KKR-20-009-G-03-05-200921	3	5	9/21/2020																										
KKR-20-009	KKR-20-009-C-05-07-200921	5	7	9/21/2020	**3.3**	0.0038 U	**3.3 J+**	0.0018 U	0.0047 U	0.0032 U	0.0032 U	0.0043 U	0.0046 U	0.0019 U	**197**	**0.54 J**	**1.5**	**0.98**	**4.5**	**12**	**12**	**17**	**9.5**	**8.4**	**6.7**	**17**	**2.6**	**40**	**2.6**	**7.6**
KKR-20-009	KKR-20-009-G-05-07-200921	5	7	9/21/2020																										
KKR-20-009	KKR-20-009-C-07-09-200921	7	9	9/21/2020	**0.82**	0.0039 U	**0.82**	0.0018 U	0.0048 U	0.0033 U	0.0032 U	0.0044 U	0.0048 U	0.002 U	**83.5**	**0.4**	**0.69**	**0.53**	**1.6**	**5.6**	**5.4**	**7.1**	**3.9**	**3.7**	**2.5**	**7.2**	**1**	**16**	**1**	**3.5**
KKR-20-009	KKR-20-009-G-07-09-200921	7	9	9/21/2020																										
KKR-20-009	KKR-20-009-C-09-9.9-200921	9	9.9	9/21/2020	0.0022 U	0.0034 U	0.0036 U	0.0016 U	0.0043 U	0.0029 U	0.0029 U	0.0039 U	0.0043 U	0.0018 U	**13.9**	**0.11 J**	**0.13 J**	**0.16**	**0.31**	**1.1**	**1**	**1.2**	**0.7 J**	**0.68**	**0.44**	**1.2**	**0.29**	**2.1**	**0.18**	**0.61**
KKR-20-009	KKR-20-009-G-09-9.9-200921	9	9.9	9/21/2020																										
KKR-20-010	KKR-20-010-C-00-01-200918	0	1	9/18/2020	**0.28**	0.0014 UJ	**0.28 J**	0.00065 UJ	0.0017 UJ	0.0012 UJ	0.0012 UJ	0.0016 UJ	0.0017 UJ	0.00071 UJ	**511**	**2.3**	**9.7**	**0.39 J**	**21**	**37**	**30**	**35**	**18**	**21**	**14**	**35**	**6.2**	**95**	**10**	**19**
KKR-20-010	KKR-20-010-C-01-03-200918	1	3	9/18/2020	**5.5**	**0.4**	0.016 U	0.0071 U	0.019 U	0.013 U	**5.1**	0.017 U	0.019 U	0.0077 U	**127**	**0.31 J**	**1.6**	**0.55 J**	**3.8**	**9**	**7.8**	**10**	**5.4**	**6.5**	**2.9**	**11**	**1.9**	**24**	**2.3**	**5.5**
KKR-20-010	KKR-20-010-C-03-05-200918	3	5	9/18/2020	**3.8**	**0.49**	0.018 U	0.0079 U	0.021 U	0.014 U	**3.3**	0.019 U	0.021 U	0.0086 U	**350**	**1.7**	**4**	**1.4**	**10**	**25**	**22**	**25**	**15**	**18**	**13**	**29**	**5.1**	**66**	**6**	**15**
KKR-20-010	KKR-20-010-C-05-07-200918	5	7	9/18/2020	**3.4**	**0.48**	0.019 U	0.0085 U	0.022 U	0.015 U	**2.9**	0.021 U	0.022 U	0.0092 U	**240**	**0.73 J**	**1.8**	**1.3**	**6.2**	**17**	**15**	**20**	**11**	**13**	**8.1**	**22**	**3**	**45**	**3.1**	**11**
KKR-20-010	KKR-20-010-C-07-08-200918	7	8	9/18/2020	0.0012 U	0.0019 UJ	0.002 UJ	0.00089 UJ	0.0023 U	0.0016 UJ	0.0016 U	0.0021 UJ	0.0023 UJ	0.00097 UJ	**53.1**	**0.42 J**	**0.56**	**0.52 J**	**1.2**	**4**	**3.8**	**4.8**	**2.4 J**	**3.1**	**1.2**	**4.6**	**0.82**	**9**	**0.66**	**2.5**
KKR-20-011	KKR-20-011-C-00-01-200918	0	1	9/18/2020	**0.54**	0.0013 UJ	**0.12 J**	0.00064 UJ	0.0017 UJ	0.0012 UJ	0.0011 UJ	0.0015 UJ	0.0017 UJ	**0.42 J**	**46.6**	0.092 U	**0.42**	**0.21 J**	**1.2**	**3.8**	**3.3**	**3.9**	**2**	**2.8**	**1.4**	**3.8**	**0.73**	**8.8**	**0.43**	**2.2**
KKR-20-011	KKR-20-011-C-01-03-200918	1	3	9/18/2020	**5.3**	**0.34 J**	0.015 U	0.0068 U	0.018 U	0.012 U	**5**	0.017 U	0.018 U	0.0074 U	**70.4**	0.097 U	**0.83**	0.088 U	**2.2**	**5.5**	**4.7**	**6**	**3**	**3.7**	**1.9**	**5.8**	**1**	**13**	**1.4**	**3.1**
KKR-20-011	KKR-20-011-C-03-05-200918	3	5	9/18/2020	**10.6**	**0.62**	0.018 U	0.0082 U	0.022 U	0.015 U	**10**	0.02 U	0.022 U	0.009 U	**194**	**0.36 J**	**2.3**	**0.75 J**	**4.9**	**14**	**13**	**16**	**8.4**	**10**	**6.2**	**16**	**3.1**	**38**	**3**	**8.8**
KKR-20-011	KKR-20-011-C-05-07-200918	5	7	9/18/2020	**4.1**	**0.51**	0.019 U	0.0083 U	0.022 U	0.015 U	**3.6**	0.02 U	0.022 U	0.0091 U	**51.6**	**0.49**	**0.54**	**0.43**	**1.3**	**3.8**	**3.6**	**4.7**	**2.3**	**2.6**	**1.2**	**4.5**	**0.82**	**9.2**	**0.7**	**2.2**
KKR-20-011	KKR-20-011-C-07-09-200918	7	9	9/18/2020	0.0012 U	0.0019 U	0.002 U	0.00089 U	0.0023 U	0.0016 U	0.0016 U	0.0021 U	0.0023 U	0.00097 U	**220**	**0.61 J**	**1.8**	**1**	**5.4**	**15**	**14**	**19**	**10**	**13**	**7**	**19**	**3.6**	**42**	**3.1**	**11**
KKR-20-011	KKR-20-011-C-09-9.9-200918	9	9.9	9/18/2020	0.0012 U	0.0019 U	0.002 U	0.00088 U	0.0023 U	0.0016 U	0.0016 U	0.0021 U	0.0023 U	0.00096 U	**25.7**	**0.28**	**0.22 J**	**0.24 J**	**0.56**	**2**	**1.8**	**2.1**	**1.2 J**	**1.7**	**0.69**	**2.2**	**0.42**	**4.2**	**0.34**	**1.3**
KKR-20-012	KKR-20-012-C-00-01-200918	0	1	9/18/2020	**3.7**	**0.37**	0.015 U	0.0068 U	0.018 U	0.012 U	0.012 U	0.016 U	0.018 U	**3.3**	**63.1**	0.15 U	**0.79**	0.13 U	**2 J**	**4.4 J**	**4.4 J**	**5 J**	**2.8 J**	**2.9 J**	**2.4 J**	**5 J**	**0.79**	**12 J**	**0.92**	**2.2 J**
KKR-20-012	KKR-20-012-C-01-03-200918	1	3	9/18/2020	**9.1**	**0.53**	0.018 U	0.0079 U	0.021 U	0.014 U	**8.6**	0.019 U	0.021 U	0.0086 U	**185**	**0.29 J**	**1.9**	**0.51 J**	**4.6**	**14**	**12**	**16**	**8.2**	**8.9**	**5.7**	**16**	**2.6**	**36**	**2.7**	**7.4**
KKR-20-012	KKR-20-012-C-03-05-200918	3	5	9/18/2020	**7.1**	**0.9**	0.02 U	0.0089 U	0.023 U	0.016 U	**6.2**	0.022 U	0.023 U	0.0097 U	**321**	**1.1 J**	**3.1**	**1.3 J**	**7.6**	**24**	**20**	**28**	**15**	**15**	**10**	**29**	**4.2**	**62**	**4.8**	**13**
KKR-20-012	KKR-20-012-C-05-07-200918	5	7	9/18/2020	**2.6**	0.019 U	**2.6**	0.009 U	0.024 U	0.016 U	0.016 U	0.022 U	0.024 U	0.0098 U	**247**	**0.74 J**	**1.8**	**1.2**	**5.5**	**16**	**16**	**21**	**12**	**13**	**8.5**	**22**	**3.3**	**49**	**2.9**	**11**
KKR-20-012	KKR-20-012-C-07-8.8-200918	7	8.8	9/18/2020	**0.57**	0.0019 UJ	**0.57 J-**	0.0009 UJ	0.0024 UJ	0.0016 UJ	0.0016 UJ	0.0022 UJ	0.0024 UJ	0.00098 UJ	**255**	**0.99**	**1.6**	**1**	**4.3**	**16**	**17**	**23**	**12**	**15**	**8.3**	**23**	**3.8**	**52**	**2.8**	**12**
KKR-20-013	KKR-20-013-C-00-01-200918	0	1	9/18/2020	**2.6**	**0.53**	0.016 U	0.0073 U	0.019 U	0.013 U	**2.1**	0.018 U	0.019 U	0.008 U	**167**	**0.22 J**	**1.8**	**0.39 J**	**4.1**	**11**	**11**	**14**	**7.4**	**9.4**	**4.3**	**14**	**2.2**	**33**	**2.4**	**7.8**
KKR-20-013	KKR-20-013-C-01-03-200918	1	3	9/18/2020	**5.9**	**0.82**	0.018 U	0.0081 U	0.021 U	0.015 U	**5.1**	0.02 U	0.021 U	0.0088 U	**314**	**0.5 J**	**3.2**	**0.89 J**	**8.8**	**21**	**21**	**27**	**13**	**18**	**9.3**	**26**	**4.4**	**59**	**4.5**	**15**
KKR-20-013	KKR-20-013-C-03-4.6-200918	3	4.6	9/18/2020	**0.33**	0.0019 U	**0.33 J+**	0.00088 U	0.0023 U	0.0016 U	0.0016 U	0.0021 U	0.0023 U	0.00096 U	**185**	**0.33 J**	**1.3**	**0.56 J**	**4.1**	**14**	**12**	**15**	**8.2**	**9.5**	**5.7**	**17**	**3.1**	**38**	**1.7**	**8.6**
KKR-20-013	KKR-20-013-C-4.6-07-200918	4.6	7	9/18/2020	0.0016 U	0.0026 U	0.0027 U	0.0012 U	0.0032 U	0.0022 U	0.0022 U	0.0029 U	0.0032 U	0.0013 U	**0.63**	0.035 U	0.042 U	0.032 U	0.038 U	0.066 U	0.064 U	0.036 U	0.1 U	0.032 U	0.044 U	0.081 U	0.094 U	**0.097 J**	0.029 U	0.073 U
KKR-20-014	KKR-20-014-C-00-01-200917	0	1	9/17/2020	**0.38**	**0.1**	0.0057 U	0.0025 U	0.0067 U	0.0046 U	**0.28**	0.0062 U	0.0067 U	0.0028 U	**70**	0.37 U	0.44 U	**0.35 J**	**0.86 J**	**4.1**	**5.3**	**7.8**	**4.5 J**	**4.7**	**2.8**	**6.4**	**2.2**	**11**	**0.43 J**	**4.2**
KKR-20-014	KKR-20-014-C-01-3.3-200917	1	3.3	9/17/2020	**0.8**	**0.19**	0.0054 U	0.0024 U	0.0064 U	0.0044 U	**0.61**	0.0059 U	0.0064 U	0.0027 U	**68.9**	0.26 U	**0.36 J**	**0.34 J**	**0.8 J**	**3.9**	**4.6**	**8**	**4.3 J**	**4.5**	**2.1**	**6.3**	**1.7**	**12**	**0.52 J**	**4.2**
KKR-20-014	KKR-20-014-C-3.3-05-200917	3.3	5	9/17/2020	**0.0069**	0.0025 UJ	0.0027 U	0.0012 U	0.0031 U	0.0022 U	**0.0069 J**	0.0029 U	0.0031 U	0.0013 U	**0.12**	0.0086 U	0.01 U	0.0078 U	0.0093 U	0.016 U	0.015 U	0.0088 U	0.024 U	0.0077 U	0.011 U	0.02 U	0.023 U	0.0094 U	0.007 U	0.018 U
KKR-20-014	KKR-20-014-C-05-07-200917	5	7	9/17/2020	0.0016 U	0.0026 UJ	0.0028 UJ	0.0012 UJ	0.0032 UJ	0.0022 UJ	0.0022 UJ	0.003 UJ	0.0032 UJ	0.0013 UJ	0.0125 U	0.0087 U	0.01 U	0.0079 U	0.0094 U	0.016 U	0.016 U	0.0089 U	0.025 U	0.0078 U	0.011 U	0.02 U	0.023 U	0.0096 U	0.0071 U	0.018 U
KKR-20-014	KKR-20-014-C-07-8.5-200917	7	8.5	9/17/2020	**0.062**	**0.011**	0.003 U	0.0013 U	0.0035 U	0.0024 U	**0.051**	0.0032 U	0.0035 U	0.0015 U	**12.1**	**0.029 J**	**0.075**	**0.052**	**0.29**	**0.81**	**0.77**	**1.1**	**0.57**	**0.51**	**0.41**	**1.1**	**0.15**	**2.4**	**0.15**	**0.5**
KKR-20-014	KKR-20-014-C-8.5-8.8-200917	8.5	8.8	9/17/2020	**0.34**	**0.14 J+**	0.0037 U	0.0017 U	0.0044 U	0.003 U	**0.2 J+**	0.0041 U	0.0044 U	0.0018 U	**193**	**1.2 J**	**3.2**	**0.6 J**	**6.3**	**14**	**11**	**14**	**7.1 J**	**6**	**4.5**	**14**	**2.9**	**33**	**4.2**	**5.6**
KKR-20-015	KKR-20-015-C-00-01-200915	0	1	9/15/2020	**0.6**	**0.051 J+**	0.0037 U	0.0017 U	0.0044 U	0.003 U	**0.55 J+**	0.004 U	0.0043 U	0.0018 U	**263**	**1.4 J**	**3**	**0.69 J**	**7**	**19**	**19**	**24**	**13**	0.53 U	**7.5**	**23**	1.6 U	**51**	**3.9**	**13**
KKR-20-015	KKR-20-015-C-01-2.8-200915	1	2.8	9/15/2020	**0.93**	**0.16 J+**	0.0042 U	0.0019 U	0.0049 U	0.0034 U	**0.77 J**	0.0045 U	0.0049 U	0.002 U	**137**	**0.77 J**	**1.7**	0.37 U	**3.4 J**	**9.3 J**	**9.2 J**	**14 J**	**6.5 J**	**7 J**	**2.7**	**11 J**	**1.8**	**24**	**2.4**	**5.5**
KKR-20-015	KKR-20-015-C-2.8-3.3-200915	2.8	3.3	9/15/2020	0.0016 U	0.0025 UJ	0.0027 UJ	0.0012 UJ	0.0031 U	0.0022 U	0.0021 U	0.0029 U	0.0031 UJ	0.0013 U	**0.21**	0.0085 U	0.01 U	0.0078 U	0.0092 U	**0.018 J**	0.015 U	**0.021 J**	0.024 U	0.0077 U	0.011 U	**0.022 J**	0.023 U	**0.036**	0.007 U	0.018 U
KKR-20-015	KKR-20-015-C-3.3-4.7-200915	3.3	4.7	9/15/2020	0.0023 U	0.0037 U	0.0039 U	0.0017 U	0.0046 UJ	0.0032 UJ	0.0031 UJ	0.0042 UJ	0.0046 U	0.0019 UJ	**108**	**0.81**	**0.91**	**0.89**	**2.4**	**7.4**	**6.6**	**7.6**	**4.4**	**5.1**	**3.9**	**9.4**	**1.4**	**20**	**1.8**	**4.3**
KKR-20-016	KKR-20-016-C-00-01-200917	0	1	9/17/2020	**0.4**	**0.14**	0.0071 U	0.0032 U	0.0084 U	0.0058 U	**0.26**	0.0077 U	0.0083 U	0.0035 U	**59.4**	0.34 U	0.41 U	0.31 U	**0.58 J**	**3.4**	**4**	**6.9**	**3.9 J**	**4.1**	**2.4**	**5.6**	**2**	**9.4**	**0.36 J**	**3.6**
KKR-20-016	KKR-20-016-C-01-03-200917	1	3	9/17/2020	**0.47**	**0.16**	0.0072 U	0.0032 U	0.0085 U	0.0058 U	**0.31**	0.0078 U	0.0084 U	0.0035 U	**65.6**	0.46 U	0.55 U	0.42 U	**0.66 J**	**4**	**4.7**	**7.2**	**3.8 J**	**5.3**	**2.6**	**6.6**	1.2 U	**11**	0.38 U	**4.5**
KKR-20-016	KKR-20-016-C-03-4.6-200917	3	4.6	9/17/2020	**1.1**	**0.25 J**	0.0022 UJ	0.001 UJ	0.0026 UJ	0.0018 UJ	**0.86 J**	0.0024 UJ	0.0026 UJ	0.0011 UJ	**115**	0.29 U	**0.75 J**	**0.26 J**	**1.8**	**7.4**	**8.5**	**11**	**6**	**8.1**	**5**	**10**	**1.9**	**21**	**0.91 J**	**6.5**
KKR-20-016	KKR-20-016-C-4.6-06-200917	4.6	6	9/17/2020	0.00075 U	0.0012 UJ	0.0013 UJ	0.00058 UJ	0.0015 UJ	0.0011 UJ	0.001 UJ	0.0014 UJ	0.0015 UJ	0.00063 UJ	0.012 U	0.0084 U	0.01 U	0.0076 U	0.009 U	0.016 U	0.015 U	0.0086 U	0.024 U	0.0075 U	0.01 U	0.019 U	0.022 U	0.0092 U	0.0068 U	0.017 U
KKR-20-017	KKR-20-017-C-00-01-200915	0	1	9/15/2020	**0.89**	**0.14**	0.0061 U	0.0027 U	0.0072 U	0.005 U	**0.75**	0.0066 U	0.0072 U	0.003 U	**125**	0.6 U	**1.1 J**	0.55 U	**2.1 J**	**8.7**	**8.7**	**12**	**6.4 J**	**9.5**	**5.2**	**11**	1.6 U	**23**	**1.2 J**	**7.6**
KKR-20-017	KKR-20-017-C-01-1.8-200915	1	1.8	9/15/2020	**0.47**	**0.031 J-**	0.0035 UJ	0.0016 UJ	0.0041 UJ	0.0028 UJ	**0.44 J-**	0.0038 UJ	0.0041 UJ	0.0017 UJ	**51.4**	0.11 U	**0.38 J**	**0.2 J**	**1.3**	**3.7**	**3.4**	**4.4**	**2.4**	**3**	**1.7**	**4.4**	**0.9**	**10**	**0.5**	**2.6**
KKR-20-017	KKR-20-017-C-1.8-03-200915	1.8	3	9/15/2020	0.0017 U	0.0026 U	0.0028 U	0.0012 U	0.0033 U	0.0023 U	0.0022 U	0.003 U	0.0033 U	0.0014 U	0.0125 U	0.009 U	0.011 U	0.0082 U	0.0097 U	0.017 U	0.016 U	0.0092 U	0.025 U	0.0081 U	0.011 U	0.021 U	0.024 U	0.0098 U	0.0073 U	0.019 U
KKR-20-017	KKR-20-017-C-03-5.3-200915	3	5.3	9/15/2020	**0.081**	**0.0069 J**	0.0058 U	0.0026 U	0.0069 U	0.0047 U	**0.074**	0.0063 U	0.0068 U	0.0028 U	**0.88**	0.0093 U	0.011 U	0.0085 U	**0.016 J**	**0.064**	**0.071**	**0.068**	**0.05 J**	**0.06**	**0.052**	**0.083**	0.025 U	**0.15**	**0.0084 J**	**0.051**
KKR-20-018	KKR-20-018-C-00-01-200917	0	1	9/17/2020	**0.39**	**0.095 J**	0.0024 UJ	0.0011 UJ	0.0029 UJ	0.002 UJ	**0.29 J**	0.0026 UJ	0.0029 UJ	0.0012 UJ	**112**	0.39 U	**0.52 J**	0.35 U	**1.3 J**	**6.6**	**8**	**12**	**6.2 J**	**8.9**	**4**	**11**	**2.2**	**20**	**0.6 J**	**7.2**
KKR-20-018	KKR-20-018-C-01-1.5-200917	1	1.5	9/17/2020	**0.6**	**0.1**	0.0036 U	0.0016 U	0.0042 U	0.0029 U	**0.5**	0.0039 U	0.0042 U	0.0017 U	**56.5**	0.29 U	**0.52 J**	0.26 U	**1.1 J**	**3.6**	**4**	**4.5**	**2.8 J**	**4**	**2.7**	**5**	**1.3**	**9.6**	**0.5 J**	**3.3**
KKR-20-018	KKR-20-018-C-1.5-03-200917	1.5	3	9/17/2020	**0.0056**	0.0012 UJ	0.0013 UJ	0.00058 UJ	0.0015 UJ	0.001 UJ	**0.0056 J**	0.0014 UJ	0.0015 UJ	0.00063 UJ	**0.15**	0.0083 U	0.01 U	0.0076 U	0.009 U	0.016 U	0.015 U	0.0085 U	0.024 U	0.0075 U	0.01 U	0.019 U	0.022 U	**0.023 J**	0.0068 U	0.017 U
KKR-20-018	KKR-20-018-C-03-05-200917	3	5	9/17/2020	0.0008 U	0.0012 UJ	0.0013 UJ	0.00059 UJ	0.0016 UJ	0.0011 UJ	0.0011 UJ	0.0014 UJ	0.0015 UJ	0.00064 UJ	**0.11**	0.0084 U	0.01 U	0.0077 U	0.0091 U	0.016 U	0.015 U	0.0086 U	0.024 U	0.0076 U	0.01 U	0.019 U	0.022 U	0.0092 U	0.0069 U	0.017 U
KKR-20-018	KKR-20-018-C-05-6.3-200917	5	6.3	9/17/2020	**0.012**	**0.0028 J**	0.0015 UJ	0.00067 UJ	0.0018 UJ	0.0012 UJ	**0.0087 J**	0.0016 UJ	0.0018 UJ	0.00073 UJ	**0.51**	0.0097 U	0.012 U	0.0089 U	**0.019 J**	**0.046**	**0.039 J**	**0.039 J**	0.027 U	**0.022 J**	**0.013 J**	**0.041**	0.026 U	**0.092**	**0.013 J**	0.02 U
KKR-20-018	KKR-20-018-C-6.3-6.6-200917	6.3	6.6	9/17/2020	**0.68**	**0.17 J**	0.0018 UJ	0.00081 UJ	0.0021 UJ	0.0015 UJ	**0.51 J**	0.0019 UJ	0.0021 UJ	0.00088 UJ	**911**	**19**	**19**	**2**	**30**	**56**	**73**	**77**	**41**	**50**	**29**	**55**	**13**	**120**	**21**	**44**
KKR-20-019	KKR-20-019-C-00-0.9-200915	0	0.9	9/15/2020	**0.41**	**0.07**	0.0043 U	0.0019 U	0.0051 U	0.0035 U	**0.34**	0.0047 U	0.0051 U	0.0021 U	**62.7**	0.21 U	0.25 U	0.19 U	**0.62 J**	**4.1**	**4.7**	**7.4**	**3.5 J**	**4.8**	**2.6**	**5.9**	0.56 U	**11**	**0.28 J**	**3.9**
KKR-20-019	KKR-20-019-C-0.9-03-200915	0.9	3	9/15/2020	**0.062**	0.0053 U	0.0056 U	0.0025 U	0.0066 U	0.0045 U	**0.062**	0.0061 U	0.0066 U	0.0027 U	**1.7**	0.0089 U	0.011 U	**0.0083 J**	**0.033 J**	**0.15**	**0.13**	**0.15**	**0.094 J**	**0.088**	**0.072**	**0.17**	0.024 U	**0.32**	**0.015 J**	**0.076**
KKR-20-019	KKR-20-019-C-03-4.3-200915	3	4.3	9/15/2020	**0.031**	0.0051 U	0.0054 U	0.0024 U	0.0064 U	0.0044 U	**0.031**	0.0059 U	0.0063 U	0.0026 U	**0.4**	0.0086 U	0.01 U	0.0078 U	0.0093 U	**0.029 J**	**0.03 J**	**0.033 J**	0.024 U	**0.016 J**	**0.015 J**	**0.038**	0.023 U	**0.08**	0.007 U	0.018 U
KKR-20-019	KKR-20-019-C-4.3-5.2-200915	4.3	5.2	9/15/2020	0.0024 U	0.0039 UJ	0.0041 UJ	0.0018 UJ	0.0048 U	0.0033 U	0.0033 U	0.0044 U	0.0048 UJ	0.002 U	**229**	**1.1**	**1.8**	**0.89**	**4.3**	**15**	**14**	**20**	**11**	**12**	**8**	**21**	**2.8**	**45**	**2.7**	**10**
KKR-20-020	KKR-20-020-C-00-0.4-200917	0	0.4	9/17/2020	**2.1**	0.0035 UJ	**0.58 J-**	0.0016

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																		Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100		25																	
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300		75																	
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500		125																	
TSCA																																								
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
KKR-20-006	KKR-20-006-C-01-03-200916	1	3	9/16/2020	0.069 U	**3.5**	**6.5**	**17** J-	**0.019** J+	31	11 J	2.2	1	24 J	160																									
KKR-20-006	KKR-20-006-C-03-05-200916	3	5	9/16/2020	**0.17** J	**11**	**13**	**8.7**	**0.33** J+	25	8.2	2	0.62	10 J	93																									
KKR-20-006	KKR-20-006-C-05-7.2-200916	5	7.2	9/16/2020	**1.3**	**39**	**42**	**290**	**0.38** J+	430	38	13	21	140 J	980																									
KKR-20-007	KKR-20-007-C-00-1.2-200916	0	1.2	9/16/2020	0.07 U	**3.1**	**4.5**	**7.4**	**0.017** J+	23	7.3	1.9	0.61	9.1 J	96																									
KKR-20-008	KKR-20-008-C-00-01-200921	0	1	9/21/2020	0.25 U	**41**	**44**	**147**	**1.1**	685	31.4	9.8	7.8	132	633																									
KKR-20-008	KKR-20-008-C-01-03-200921	1	3	9/21/2020	**0.56** J	**33**	**35**	**71.4**	**0.3**	483	27.1	7.4	9.5	86.1	496																									
KKR-20-008	KKR-20-008-C-03-05-200921	3	5	9/21/2020	**0.48** J	**48**	**53**	**137**	**0.7**	606	42.5	15.9	13.9	139	794																									
KKR-20-008	KKR-20-008-C-05-07-200921	5	7	9/21/2020	**0.93** J	**32**	**43**	**193**	**0.59**	422	43.7	14.5	14.3	156	938																									
KKR-20-008	KKR-20-008-C-07-09-200921	7	9	9/21/2020	**0.59**	**12**	**16**	**289**	**0.75**	282	38.2	12.1	43.5	358	1230																									
KKR-20-008	KKR-20-008-C-09-10-200921	9	10	9/21/2020	**0.087** J	**0.73**	**0.79**	**19.5**	**0.12**	26.6	17.4	3.4	0.36	22.6	78.7																									
KKR-20-009	KKR-20-009-C-00-1.3-200921	0	1.3	9/21/2020	0.19 U	**7.7** J	**10** J	**21.7**	**0.03**	48	15.7	3.3	0.63	16.3	123																									
KKR-20-009	KKR-20-009-G-00-1.3-200921	0	1.3	9/21/2020																											35500									
KKR-20-009	KKR-20-009-C-1.3-03-200921	1.3	3	9/21/2020	**0.4** J	**26**	**30**	**42.1**	**0.18**	193	18.2	4.4	5.4	43.9	269																									
KKR-20-009	KKR-20-009-G-1.3-03-200921	1.3	3	9/21/2020																											42900									
KKR-20-009	KKR-20-009-C-03-05-200921	3	5	9/21/2020	**0.78** J	**58**	**63**	**84.3**	**0.53**	374	30.9	9.9	10.7	79.2	491																									
KKR-20-009	KKR-20-009-G-03-05-200921	3	5	9/21/2020																											78000									
KKR-20-009	KKR-20-009-C-05-07-200921	5	7	9/21/2020	**0.46** J	**22**	**32**	**190**	**0.49**	415	41.4	13.2	11.2	131	754																									
KKR-20-009	KKR-20-009-G-05-07-200921	5	7	9/21/2020																											63500									
KKR-20-009	KKR-20-009-C-07-09-200921	7	9	9/21/2020	**0.54**	**8.8**	**14**	**308**	**1.3**	248	35.9	10.8	2.9	135	540																									
KKR-20-009	KKR-20-009-G-07-09-200921	7	9	9/21/2020																											64300									
KKR-20-009	KKR-20-009-C-09-9.9-200921	9	9.9	9/21/2020	**0.24**	**1.2**	**2.2**	**102**	**0.85**	94.9	20.4	7.6	0.77	73.2	240																									
KKR-20-009	KKR-20-009-G-09-9.9-200921	9	9.9	9/21/2020																											55100									
KKR-20-010	KKR-20-010-C-00-01-200918	0	1	9/18/2020	**3.3**	**85**	**69**	**22**	**0.031**	61	12	2.2	0.81	23	140																									
KKR-20-010	KKR-20-010-C-01-03-200918	1	3	9/18/2020	0.17 U	**16**	**18**	**33**	**0.15**	170	17	4.7	2.6	39	220																									
KKR-20-010	KKR-20-010-C-03-05-200918	3	5	9/18/2020	**1.3** J	**45**	**47**	**60**	**0.24**	330	24	6.5	6.5	63	400																									
KKR-20-010	KKR-20-010-C-05-07-200918	5	7	9/18/2020	**0.61** J	**26**	**35**	**140**	**0.46**	390	35	13	14	120	690																									
KKR-20-010	KKR-20-010-C-07-08-200918	7	8	9/18/2020	**0.79**	**5.2**	**7.5**	**570** J	**1.7**	340 J	40	14	2.7	230 J	730																									
KKR-20-011	KKR-20-011-C-00-01-200918	0	1	9/18/2020	0.075 U	**4.7**	**6.8**	**15** J	**0.04**	510 J	10	2.4	0.98	14 J	140																									
KKR-20-011	KKR-20-011-C-01-03-200918	1	3	9/18/2020	0.079 U	**8.7**	**9.4**	**18** J	**1.7**	89 J	11	3	1.5	23 J	140																									
KKR-20-011	KKR-20-011-C-03-05-200918	3	5	9/18/2020	**0.21** J	**23**	**26**	**52** J	**0.29**	330 J	27	8.1	4.5	68 J	380																									
KKR-20-011	KKR-20-011-C-05-07-200918	5	7	9/18/2020	**0.78**	**5.5**	**6.9**	**67** J	**0.31**	390 J	30	8.5	10	80 J	520																									
KKR-20-011	KKR-20-011-C-07-09-200918	7	9	9/18/2020	**0.29** J	**25**	**29**	**650** J	**1.2**	280 J	38	13	4.4	170 J	790																									
KKR-20-011	KKR-20-011-C-09-9.9-200918	9	9.9	9/18/2020	**0.57**	**2.4**	**3.5**	**140** J	**0.88**	130 J	27	11	1.1	93 J	320																									
KKR-20-012	KKR-20-012-C-00-01-200918	0	1	9/18/2020	0.12 U	**7.9** J	**9.4** J	**24** J	**0.07**	190 J	12	2.9	1.4	25 J	180																									
KKR-20-012	KKR-20-012-C-01-03-200918	1	3	9/18/2020	**0.24** J	**22**	**26**	**47** J	**0.27**	280 J	23	6.7	5.1	57 J	320																									
KKR-20-012	KKR-20-012-C-03-05-200918	3	5	9/18/2020	0.3 U	**37**	**46**	**93** J	**0.49**	500 J	33	10	11	95 J	620																									
KKR-20-012	KKR-20-012-C-05-07-200918	5	7	9/18/2020	**0.59** J	**26**	**36**	**140** J	**0.55**	380 J	34	14	8.2	94 J	570																									
KKR-20-012	KKR-20-012-C-07-8.8-200918	7	8.8	9/18/2020	**1**	**26**	**35**	**150** J	**1**	260 J	27	11	25	130 J	900																									
KKR-20-013	KKR-20-013-C-00-01-200918	0	1	9/18/2020	**0.22** J	**20**	**24**	**55** J	**1.7**	440 J	19	5.1	6	51 J	680																									
KKR-20-013	KKR-20-013-C-01-03-200918	1	3	9/18/2020	**0.36** J	**40**	**42**	**76** J	**0.41**	550 J	23	8.4	5.6	77 J	640																									
KKR-20-013	KKR-20-013-C-03-4.6-200918	3	4.6	9/18/2020	**0.55** J	**18**	**27**	**44** J	**0.27**	290 J	20	5.2	2.9	53 J	300																									
KKR-20-013	KKR-20-013-C-4.6-07-200918	4.6	7	9/18/2020	0.029 U	**0.062** J	**0.075** J	**13** J	0.02 U	**7.5** J	15	3.1	0.23	17 J	54																									
KKR-20-014	KKR-20-014-C-00-01-200917	0	1	9/17/2020	0.3 U	**4.8**	**10**	**41.4**	**0.098**	87.5	23.7	5	0.99	86	414																									
KKR-20-014	KKR-20-014-C-01-3.3-200917	1	3.3	9/17/2020	0.21 U	**5**	**10**	**48.6**	**0.15**	122	28.4	5.9	1.6	96.2	488																									
KKR-20-014	KKR-20-014-C-3.3-05-200917	3.3	5	9/17/2020	0.007 U	0.0096 U	**0.009** J	**6.4**	0.0097 U	**2.1**	**4.5**	**0.89**	**0.045** J	**3.5**	**9.4**																									
KKR-20-014	KKR-20-014-C-05-07-200917	5	7	9/17/2020	0.0071 U	0.0097 U	0.0086 U	**3.8**	0.011 U	**2**	**3.6**	**1.5**	**0.049** J	**5.4**	**13.6**																									
KKR-20-014	KKR-20-014-C-07-8.5-200917	7	8.5	9/17/2020	**0.033** J	**1.2**	**2**	**4.6**	0.01 U	**4.6**	**4.1**	**1.1**	**0.082**	**5.7**	**17.6**																									
KKR-20-014	KKR-20-014-C-8.5-8.8-200917	8.5	8.8	9/17/2020	**4.1**	**31**	**30**	**109**	**1**	650	21.9	8.7	3.4	181	730																									
KKR-20-015	KKR-20-015-C-00-01-200915	0	1	9/15/2020	**2.3** J	**34**	**40**	**16.1**	**0.05** J	**76.6** J	**9.6**	**2**	**1.3**	**20.7** J	**154**																									
KKR-20-015	KKR-20-015-C-01-2.8-200915	1	2.8	9/15/2020	**1** J	**18** J	**19** J	**22.1**	**0.13** J	**121** J	**12**	**3.1**	**0.96**	**32.2** J	**215**																									
KKR-20-015	KKR-20-015-C-2.8-3.3-200915	2.8	3.3	9/15/2020	0.0069 U	**0.017** J	**0.026** J	**3.9**	0.0092 U	**2** J	**3.7**	**0.94**	**0.052** J	**4.6** J	**10**																									
KKR-20-015	KKR-20-015-C-3.3-4.7-200915	3.3	4.7	9/15/2020	**1.7**	**14**	**15**	**557**	**3.2** J	**353** J	**25.8**	**11.9**	**3**	**116** J	**624**																									
KKR-20-016	KKR-20-016-C-00-01-200917	0	1	9/17/2020	0.28 U	**3.8**	**8.7**	**46.6**	**0.12**	**91.3**	**27.4**	**5.9**	**1.2**	**92.5**	**505**																									
KKR-20-016	KKR-20-016-C-01-03-200917	1	3	9/17/2020	0.37 U	**4.2**	**9.3**	**51.9**	**0.41**	**116**	**30.9**	**6.5**	**1.5**	**115**	**584**																									
KKR-20-016	KKR-20-016-C-03-4.6-200917	3	4.6	9/17/2020	0.23 U	**9.9**	**16**	**49**	**0.15**	176	**26.4**	**7.5**	**1.6**	**85.2**	**413**																									
KKR-20-016	KKR-20-016-C-4.6-06-200917	4.6	6	9/17/2020	0.0068 U	0.0093 U	0.0082 U	**3.5**	0.01 U	**1.5**	**2.9**	**0.92**	**0.034** J	**4.2**	**9.4**																									
KKR-20-017	KKR-20-017-C-00-01-200915	0	1	9/15/2020	0.49 U	**11**	**16**	**43**	**0.13** J	**107** J	**23.5**	**5.2**	**1.3**	**73** J	**403**																									
KKR-20-017	KKR-20-017-C-01-1.8-200915	1	1.8	9/15/2020	0.089 U	**5.1**	**7.3**	**15.3**	**0.06** J	**55.4** J	**9.6**	**2**	**0.89**	**24.9** J	**122**																									
KKR-20-017	KKR-20-017-C-1.8-03-200915	1.8	3	9/15/2020	0.0073 U	0.01 U	0.0088 U	**2.7**	0.011 U	**1.7** J	**2.3**	**0.74**	**0.041** J	**2.7** J	**14.7**																									
KKR-20-017	KKR-20-017-C-03-5.3-200915	3	5.3	9/15/2020	0.0076 U	**0.063**	**0.11**	**3.7**	0.0093 U	**5** J	**4.1**	**1.3**	**0.06**	**5.1** J	**12.5**																									
KKR-20-018	KKR-20-018-C-00-01-200917	0	1	9/17/2020	0.31 U	**7.7**	**15**	**41.3**	**0.12**	**91.6**	**27.2**	**6.1**	**1.1**	**88.5**	**477**																									
KKR-20-018	KKR-20-018-C-01-1.5-200917	1	1.5	9/17/2020	0.23 U	**5.1**	**8.1**	**26.4**	**0.12**	**103**	**16.2**	**3.4**	**0.98**	**47.3**	**238**																									
KKR-20-018	KKR-20-018-C-1.5-03-200917	1.5	3	9/17/2020	0.0068 U	**0.012** J	**0.021** J	**4.9**	0.0084 U	**2.9**	**5**	**1.3**	**0.08**	**6.6**	**14.4**																									
KKR-20-018	KKR-20-018-C-03-05-200917	3	5	9/17/2020	0.0068 U	0.0094 U	**0.011** J	**4**	0.0098 U	**2.5**	**3.6**	**2.2**	**0.055**	**35.2**	**10.9**																									
KKR-20-018	KKR-20-018-C-05-6.3-200917	5	6.3	9/17/2020	0.0079 U	**0.048**	**0.086**	**4.1**	**0.068**	**2.8**	**3.9**	**1.3**	**0.054** J	**4.8**	**13.8**																									
KKR-20-018	KKR-20-018-C-6.3-6.6-200917	6.3	6.6	9/17/2020	**32**	**130**	**100**	**231**	**1.1**	544	**19.5**	**8.2**	**3**	**104**	**624**																									
KKR-20-019	KKR-20-019-C-00-0.9-200915	0	0.9	9/15/2020	0.17 U	**4.5**	**8.7**	**23.2**	**0.069** J	**50.7** J	**13.4**	**3.5**	**0.66**	**42.1** J	**215**																									
KKR-20-019	KKR-20-019-C-0.9-03-200915	0.9	3	9/15/2020	0.0073 U	**0.11**	**0.29**	**4**	0.011 U	**7.6** J	**3.9**	**1.2**	**0.13**	**6.2** J	**19.6**																									
KKR-20-019	KKR-20-019-C-03-4.3-200915	3	4.3	9/15/2020	0.007 U	**0.027** J	**0.07**	**4**	0.01 U	**2.7** J	**3.4**	**1.4**	**0.068**	**3.1** J	**9.7**																									
KKR-20-019	KKR-20-019-C-4.3-5.2-200915	4.3	5.2	9/15/2020	**1.9**	**25**	**33**	**388**	**1.9** J	**576** J	**36.8**	**24.1**	**129**	**323** J	**2700**																									
KKR-20-020	KKR-20-020-C-00-0.4-200917	0	0.4	9/17/2020	0.38 U	**13**	**17**	**53.6**	**0.17**	**147** J	**29**	**6.7**	**1.7** J	**89.1** J	**418**																									
KKR-20-020	KKR-20-020-C-0.4-1.8-200917	0.4	1.8	9/17/2020	0.0071 U	0.0098 U	0.0087 U	**3.1**	0.011 U	**2.6** J	**2.5**	**1.6**	**0.062** J	**2.7** J	**7.6**																									
KKR-20-020	KKR-20-020-C-1.8-03-200917	1.8	3	9/17/2020	**2.6**	**30**	**37**	**218**	**1.7**	483 J	**44.7**	**23.6**	**32.4** J	**181** J	**1300** J																									
KKR-20-020	KKR-20-020-C-03-4.1-200917	3	4.1	9/17/2020	**2.4**	**26**	**37**	**508**	**4.8**	236 J	**15.1**	**10.1**	**26.6** J	**99.7** J	**664**																									
KKR-20-021	KKR-20-021-C-00-01-200917	0	1	9/17/2020	0.37 U	**5.8**	**12**	**46.8**	**0.13**	143 J	**26.9**	**6**	**1.2** J	**84.6** J	**453**																									
KKR-20-021	KKR-20-021-C-01-2.1-200917	1	2.1	9/17/2020	0.38 U	**7.2**	**14**	**41.4**	**0.14**	**91.5** J	**22**	**4.6**	**1.2** J	**76.9** J	**396**																									
KKR-20-021	KKR-20-021-C-2.1-3.2-200917	2.1	3.2	9/17/2020	**0.27** J	**6.4**	**6.3**	**12.1**	**0.023**	**21.8** J	**7.8**	**2**	**0.42** J	**17.2** J	**61.6**																									
KKR-20-021	KKR-20-021-C-3.2-05-200917	3.2	5	9/17/2020	0.0073 U	0.01 U	0.0088 U	**4.4**	0.01 U	**2.2** J	**4.1**	**1.5**	**0.057** J	**4.1** J	**12.1**																									
KKR-20-021	KKR-20-021-C-05-5.8-200917	5	5.8	9/17/2020	0.007 U	**0.03** J	**0.045**	**4.1**	0.0088 U	**3.6** J	**4**	**3.9**	**0.12** J	**9.2** J	**12.3**																									
KKR-20-022	KKR-20-022-C-00-01-200914	0	1	9/14/2020	**0.39** J	**6.2**	**11**	**149**	**0.75**	824	**25.3**	**8**	**7.2**	**102**	**538**																									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB										PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8												
WI CBSQG PEC					3										68.4												
WI CBSQG PEC					5										114												
TSCA					50																						
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KKR-20-022	KKR-20-022-C-01-03-200914	1	3	9/14/2020	0.0024 U	0.0038 UJ	0.004 U	0.0018 U	0.0047 U	0.0032 U	0.0032 U	0.0043 U	0.0047 U	0.0019 U	**80.4**	**0.5**	**0.67**	**0.41**	**1.8**	**6.6**	**5.5**	**6.3**	**3.5**	**4**	**3**	**7.3**	**1.1**	**15**	**1**	**3.4**
KKR-20-022	KKR-20-022-C-03-05-200914	3	5	9/14/2020	0.0024 U	0.0038 UJ	0.004 U	0.0018 U	0.0047 U	0.0032 U	0.0032 U	0.0043 U	0.0047 U	0.0019 U	0.018 U	0.013 U	0.015 U	0.012 U	0.014 U	0.024 U	0.023 U	0.013 U	0.036 U	0.011 U	0.016 U	0.029 U	0.034 U	0.014 U	0.01 U	0.026 U
KKR-20-023	KKR-20-023-C-00-01-200914	0	1	9/14/2020	**0.41**	**0.089 J**	0.005 U	0.0022 U	0.0059 U	0.0041 U	**0.32**	0.0054 U	0.0059 U	0.0024 U	**105**	0.41 U	0.49 U	**0.37 J**	**1.2 J**	**6**	**7.7**	**12**	**6.2 J**	**8.6**	**4.3**	**10**	**1.9**	**18**	**0.65 J**	**6.5**
KKR-20-023	KKR-20-023-G-00-01-200914	0	1	9/14/2020																										
KKR-20-023	KKR-20-023-C-01-03-200914	1	3	9/14/2020	**7.1**	**0.74 J**	0.041 U	0.018 U	0.048 U	0.033 U	**6.4**	0.044 U	0.048 U	0.02 U	**336**	**0.81**	**2.3**	**1.2**	**6.8**	**23**	**22**	**32**	**16**	**18**	**10**	**32**	**5**	**68**	**3.8**	**16**
KKR-20-023	KKR-20-023-G-01-03-200914	1	3	9/14/2020																										
KKR-20-023	KKR-20-023-C-03-05-200914	3	5	9/14/2020	**1.5**	0.0039 U	**1.5 J**	0.0018 U	0.0048 U	0.0033 U	0.0033 U	0.0044 U	0.0048 U	0.002 U	**350**	**0.87 J**	**2.5**	**1.3 J**	**7.8**	**25**	**24**	**31**	**17**	**18**	**12**	**33**	**4.7**	**67**	**4.1**	**15**
KKR-20-023	KKR-20-023-G-03-05-200914	3	5	9/14/2020																										
KKR-20-023	KKR-20-023-C-05-07-200914	5	7	9/14/2020	0.0027 U	0.0043 UJ	0.0045 U	0.002 U	0.0053 U	0.0037 U	0.0036 U	0.0049 U	0.0053 U	0.0022 U	**159**	**0.72**	**1.4**	**0.88**	**3.5**	**12**	**10**	**14**	**7**	**7.6**	**4**	**15**	**2.2**	**31**	**2.3**	**6.3**
KKR-20-023	KKR-20-023-G-05-6.2-200914	5	6.2	9/14/2020																										
KKR-20-023	KKR-20-023-C-07-8.9-200914	7	8.9	9/14/2020	0.0028 U	0.0044 UJ	0.0047 U	0.0021 U	0.0055 U	0.0038 U	0.0037 U	0.0051 U	0.0055 U	0.0023 U	**153**	**1.4**	**1.6**	**0.94**	**3.5**	**12**	**9.6**	**11**	**6.2**	**7.2**	**5**	**13**	**1.8**	**29**	**2.4**	**5.9**
KKR-20-024	KKR-20-024-C-00-01-200915	0	1	9/15/2020	**1.4**	**0.23**	0.0049 U	0.0022 U	0.0057 U	0.004 U	**1.2**	0.0053 U	0.0057 U	0.0024 U	**88.7**	0.16 U	**0.49 J**	**0.3 J**	**1.3**	**5.9**	**6.7**	**9**	**5.3**	**6.8**	**4.1**	**8.1**	**1.5**	**15**	**0.66**	**5.1**
KKR-20-024	KKR-20-024-C-01-03-200915	1	3	9/15/2020	**0.81**	0.0037 UJ	**0.81 J+**	0.0017 UJ	0.0046 UJ	0.0032 UJ	0.0031 UJ	0.0042 UJ	0.0046 UJ	0.0019 UJ	**172**	**0.63**	**1.1**	**0.8**	**3.5**	**11**	**11**	**16**	**8.8**	**9.9**	**5.7**	**16**	**2.7**	**34**	**1.8**	**8.4**
KKR-20-024	KKR-20-024-C-03-05-200915	3	5	9/15/2020	**0.16**	0.0078 UJ	**0.16 J-**	0.0037 UJ	0.0097 UJ	0.0067 UJ	0.0066 UJ	0.0089 UJ	0.0097 UJ	0.004 UJ	**138**	**0.96**	**1.2**	**0.9**	**3.4**	**9.6**	**8.9**	**12**	**6.3**	**6.6**	**3.9**	**12**	**1.9**	**27**	**2.1**	**5.8**
KKR-20-024	KKR-20-024-C-05-07-200915	5	7	9/15/2020	0.0024 U	0.0038 UJ	0.004 UJ	0.0018 UJ	0.0047 UJ	0.0033 UJ	0.0032 UJ	0.0044 UJ	0.0047 UJ	0.002 UJ	**99.3**	**1.3**	**1.2**	**0.55**	**2.6**	**7.1**	**6.1**	**7.4**	**3.9**	**4.7**	**3**	**8.2**	**1.4**	**18**	**1.7**	**3.9**
KKR-20-024	KKR-20-024-C-07-7.5-200915	7	7.5	9/15/2020	**0.055**	**0.01 J**	0.0038 U	0.0017 U	0.0045 U	0.0031 U	**0.045 J**	0.0041 U	0.0044 U	0.0019 U	**37**	**0.4**	**0.46**	**0.34**	**0.94**	**2.6**	**2.3**	**2.7**	**1.6**	**1.8**	**1.1**	**3.2**	**0.49**	**6.8**	**0.52**	**1.5**
KKR-20-025	KKR-20-025-C-00-1.2-200914	0	1.2	9/14/2020	**1.1**	**0.12**	0.0043 U	0.0019 U	0.0051 U	0.0035 U	**1**	0.0047 U	0.005 U	0.0021 U	**93.9**	0.28 U	**0.42 J**	**0.37 J**	**1.1 J**	**6.1**	**7.5**	**10**	**5.6 J**	**7.2**	**4.1**	**9.1**	0.73 U	**17**	**0.61 J**	**5.8**
KKR-20-025	KKR-20-025-C-1.2-2.6-200914	1.2	2.6	9/14/2020	0.0032 U	0.0051 U	0.0054 U	0.0024 U	0.0064 U	0.0044 U	0.0043 U	0.0058 U	0.0063 U	0.0026 U	**0.85**	0.0089 U	0.011 U	0.0081 U	**0.021 J**	**0.074**	**0.06**	**0.083**	**0.041 J**	**0.047**	**0.018 J**	**0.077**	0.024 U	**0.15**	**0.015 J**	**0.035 J**
KKR-20-025	KKR-20-025-C-2.6-05-200914	2.6	5	9/14/2020	0.0024 U	0.0038 U	0.004 U	0.0018 U	0.0047 U	0.0032 U	0.0032 U	0.0043 U	0.0047 U	0.0019 U	**27.6**	**0.35**	**0.28**	**0.32**	**0.72**	**1.9**	**1.7**	**2.2**	**1.3**	**1.5**	**0.6**	**2.5**	**0.35**	**4.6**	**0.42**	**1.1**
KKR-20-025	KKR-20-025-C-05-5.9-200914	5	5.9	9/14/2020	0.0024 U	0.0038 UJ	0.004 UJ	0.0018 UJ	0.0047 UJ	0.0032 UJ	0.0032 UJ	0.0043 UJ	0.0047 UJ	0.0019 UJ	**7.9**	**0.1 J**	**0.14 J**	**0.045 J**	**0.22**	**0.51**	**0.47**	**0.46**	**0.33 J**	**0.41**	**0.28**	**0.52**	0.1 U	**1.3**	**0.18**	**0.36**
KKR-20-026	KKR-20-026-C-00-01-200921	0	1	9/21/2020	**0.0054**	0.0031 U	0.0033 UJ	0.0015 UJ	0.0039 UJ	0.0027 UJ	**0.0054 J**	0.0036 UJ	0.0038 UJ	0.0016 UJ	0.015 U	0.011 U	0.013 U	0.0097 U	0.011 U	0.02 U	0.019 U	0.011 U	0.03 U	0.0095 U	0.013 U	0.025 U	0.028 U	0.012 U	0.0087 U	0.022 U
KKR-20-026	KKR-20-026-C-01-3.2-200921	1	3.2	9/21/2020	0.0019 U	0.003 U	0.0031 UJ	0.0014 UJ	0.0037 UJ	0.0025 UJ	0.0025 UJ	0.0034 UJ	0.0037 UJ	0.0015 UJ	0.015 U	0.01 U	0.012 U	0.0092 U	0.011 U	0.019 U	0.018 U	0.01 U	0.029 U	0.0091 U	0.013 U	0.023 U	0.027 U	0.011 U	0.0083 U	0.021 U
KKR-20-026	KKR-20-026-C-3.2-05-200921	3.2	5	9/21/2020	0.0021 U	0.0033 U	0.0034 UJ	0.0015 UJ	0.0041 UJ	0.0028 UJ	0.0027 UJ	0.0037 UJ	0.004 UJ	0.0017 UJ	0.015 U	0.011 U	0.013 U	0.0098 U	0.012 U	0.02 U	0.019 U	0.011 U	0.03 U	0.0097 U	0.013 U	0.025 U	0.029 U	0.012 U	0.0088 U	0.022 U
KKR-20-027	KKR-20-027-C-00-01-200911	0	1	9/11/2020	**1.8**	**0.45 J+**	0.0055 U	0.0024 U	0.0065 U	0.0044 U	**1.3 J+**	0.0059 U	0.0064 U	0.0027 U	**75.4**	0.26 U	**0.4 J**	**0.47 J**	**1 J**	**5**	**5.6**	**8**	**4.5 J**	**5.1**	**3**	**7**	**2**	**12**	**0.49 J**	**4.5**
KKR-20-027	KKR-20-027-C-01-03-200911	1	3	9/11/2020	**0.95**	**0.24 J-**	0.0042 UJ	0.0019 UJ	0.005 UJ	0.0034 UJ	**0.71 J-**	0.0046 UJ	0.0049 UJ	0.0021 UJ	**91.3**	**0.17 J**	**0.8**	**0.38 J**	**1.4**	**6.2**	**6.3**	**8.9**	**4.8**	**5.1**	**2.8**	**8**	**1.5**	**17**	**0.84**	**4.7**
KKR-20-027	KKR-20-027-C-03-4.3-200911	3	4.3	9/11/2020	**1.6**	**0.38**	0.0039 U	0.0018 U	0.0046 U	0.0032 U	**1.2**	0.0042 U	0.0046 U	0.0019 U	**143**	**0.49 J**	**1.3**	**1**	**3.5**	**9.9**	**9**	**12**	**6.8**	**6.7**	**4.4**	**12**	**2.3**	**27**	**1.8**	**6.1**
KKR-20-028	KKR-20-028-C-00-01-200921	0	1	9/21/2020	**0.0081**	0.0043 U	0.0045 UJ	0.002 UJ	0.0053 UJ	0.0036 UJ	**0.0081 J**	0.0049 UJ	0.0053 UJ	0.0022 UJ	**9**	0.058 U	0.07 U	**0.056 J**	**0.2 J**	**0.7**	**0.64**	**0.86**	**0.47 J**	**0.42**	**0.29**	**0.77**	**0.32**	**1.5**	**0.078 J**	**0.41**
KKR-20-028	KKR-20-028-C-01-03-200921	1	3	9/21/2020	0.0017 U	0.0026 U	0.0028 UJ	0.0012 UJ	0.0033 UJ	0.0023 UJ	0.0022 UJ	0.003 UJ	0.0033 UJ	0.0014 UJ	0.0125 U	0.0088 U	0.011 U	0.008 U	0.0095 U	0.017 U	0.016 U	0.009 U	0.025 U	0.0079 U	0.011 U	0.02 U	0.023 U	0.0097 U	0.0072 U	0.018 U
KKR-20-028	KKR-20-028-C-03-05-200921	3	5	9/21/2020	0.002 U	0.0032 UJ	0.0034 UJ	0.0015 UJ	0.004 UJ	0.0027 UJ	0.0027 UJ	0.0036 UJ	0.0039 UJ	0.0016 UJ	0.016 U	0.011 U	0.013 U	0.0099 U	0.012 U	0.02 U	0.02 U	0.011 U	0.031 U	0.0097 U	0.014 U	0.025 U	0.029 U	0.012 U	0.0089 U	0.022 U
KKR-20-028	KKR-20-028-C-05-07-200921	5	7	9/21/2020	0.0009 U	0.0015 U	0.0015 UJ	0.00069 UJ	0.0018 UJ	0.0012 UJ	0.0012 UJ	0.0017 UJ	0.0018 UJ	0.00075 UJ	0.014 U	0.01 U	0.012 U	0.0091 U	0.011 U	0.019 U	0.018 U	0.01 U	0.028 U	0.009 U	0.012 U	0.023 U	0.027 U	0.011 U	0.0082 U	0.021 U
KKR-20-028	KKR-20-028-C-07-8.9-200921	7	8.9	9/21/2020	0.00085 U	0.0014 U	0.0014 UJ	0.00064 UJ	0.0017 UJ	0.0012 UJ	0.0011 UJ	0.0016 UJ	0.0017 UJ	0.0007 UJ	0.013 U	0.0092 U	0.011 U	0.0084 U	0.01 U	0.017 U	0.017 U	0.0094 U	0.026 U	0.0083 U	0.012 U	0.021 U	0.025 U	0.01 U	0.0075 U	0.019 U
KKR-20-028	KKR-20-028-C-8.9-9.7-200921	8.9	9.7	9/21/2020	**0.0028**	0.0029 U	0.003 UJ	0.0014 UJ	0.0036 UJ	0.0025 UJ	**0.0028 J**	0.0033 UJ	0.0035 UJ	0.0015 UJ	0.014 U	0.0096 U	0.012 U	0.0088 U	0.01 U	0.018 U	0.017 U	0.0099 U	0.027 U	0.0087 U	0.012 U	0.022 U	0.026 U	0.011 U	0.0079 U	0.02 U
KKR-20-029	KKR-20-029-C-00-01-200911	0	1	9/11/2020	**0.7**	**0.11 J-**	0.0053 UJ	0.0024 UJ	0.0063 UJ	0.0043 UJ	**0.59 J-**	0.0058 UJ	0.0063 UJ	0.0026 UJ	**79.3**	0.26 U	**0.45 J**	**0.36 J**	**1.2**	**5.1**	**5.8**	**9.4**	**4.5 J**	**4.6**	**2.2**	**7.3**	**2**	**13**	**0.58 J**	**4.3**
KKR-20-029	KKR-20-029-G-00-01-200911	0	1	9/11/2020																										
KKR-20-029	KKR-20-029-C-01-03-200911	1	3	9/11/2020	**2.1**	**0.36 J-**	0.0043 UJ	0.0019 UJ	0.0051 UJ	0.0035 UJ	**1.7 J-**	0.0047 UJ	0.005 UJ	0.0021 UJ	**127**	**0.24 J**	**1**	**0.62 J**	**2.3**	**8.6**	**8.9**	**12**	**6.6**	**6.9**	**4.1**	**11**	**2.2**	**24**	**1.2**	**6.4**
KKR-20-029	KKR-20-029-G-01-03-200911	1	3	9/11/2020																										
KKR-20-029	KKR-20-029-C-03-05-200911	3	5	9/11/2020	**11.3**	**1.6**	0.042 U	0.019 U	0.049 U	0.034 U	**9.7**	0.045 U	0.049 U	0.02 U	**343**	**0.63 J**	**3.8**	**1.3**	**7.2**	**22**	**22**	**28**	**15**	**17**	**10**	**26**	**4.2**	**68**	**4.8**	**15**
KKR-20-029	KKR-20-029-G-03-05-200911	3	5	9/11/2020																										
KKR-20-029	KKR-20-029-C-05-6.1-200911	5	6.1	9/11/2020	**19.5**	**1.5**	0.082 U	0.037 U	0.097 U	0.066 U	**18**	0.089 U	0.096 U	0.04 U	**227**	**0.84**	**2.1**	**0.88**	**4.4**	**15**	**15**	**20**	**11**	**11**	**7.2**	**19**	**3**	**44**	**3**	**10**
KKR-20-029	KKR-20-029-G-05-5.8-200911	5	5.8	9/11/2020																										
KKR-20-029	KKR-20-029-C-6.1-6.5-200911	6.1	6.5	9/11/2020	**0.049**	0.0028 U	0.0029 U	0.0013 U	0.0034 U	0.0024 U	**0.049**	0.0031 U	0.0034 U	0.0014 U	**0.2**	0.0091 U	0.011 U	0.0083 U	0.0099 U	0.017 U	0.017 U	**0.01 J**	0.026 U	**0.012 J**	0.011 U	**0.023 J**	0.024 U	**0.018 J**	0.0075 U	0.019 U
KKR-20-030	KKR-20-030-C-00-01-200911	0	1	9/11/2020	**2.5**	**0.28 J+**	0.0045 U	0.002 U	0.0053 U	0.0036 U	**2.2 J+**	0.0048 U	0.0052 U	0.0022 U	**102**	0.22 U	**0.67 J**	**0.46 J**	**1.8**	**7**	**7.4**	**10**	**5.8**	**5.8**	**3.8**	**8.7**	**1.8**	**18**	**0.93**	**5.4**
KKR-20-030	KKR-20-030-C-01-2.4-200911	1	2.4	9/11/2020	**1.6**	**0.22 J-**	0.0045 UJ	0.002 UJ	0.0054 UJ	0.0037 UJ	**1.4 J-**	0.0049 UJ	0.0053 UJ	0.0022 UJ	**103**	**0.26 J**	**0.66 J**	**0.61 J**	**1.7**	**6.8**	**7.4**	**10**	**5.7**	**6.1**	**3.9**	**9**	**2**	**18**	**0.96**	**5.3**
KKR-20-031	KKR-20-031-C-00-01-200917	0	1	9/17/2020	**49**	**28**	0.05 U	0.022 U	0.059 U	0.04 U	**21**	0.054 U	0.058 U	0.024 U	**128**	0.79 U	0.95 U	0.72 U	**2.4 J**	**9.3**	**10**	**13**	**7.7 J**	**10**	**6.2**	**11**	**2.4 J**	**20**	**0.75 J**	**7.2**
KKR-20-031	KKR-20-031-C-01-03-200917	1	3	9/17/2020	**280**	**110**	0.26 U	0.12 U	0.31 U	0.21 U	**170**	0.29 U	0.31 U	0.13 U	**150**	**0.8**	**1.5**	**0.78**	**2.5**	**12**	**11**	**14**	**8**	**9.5**	**6.3**	**14**	**2**	**29**	**1.5**	**7.3**
KKR-20-031	KKR-20-031-C-03-4.7-200917	3	4.7	9/17/2020	**21**	0.12 U	**21**	0.057 U	0.15 U	0.1 U	0.1 U	0.14 U	0.15 U	0.063 U	**94.8**	**0.66 J**	**0.83**	**1.4**	**2.5**	**7.2 J**	**6.6 J**	**9.1 J**	**4.7 J**	**5.4 J**	**3**	**8.6 J**	**1.3**	**17 J**	**0.69 J**	**4.7 J**
KKR-20-032	KKR-20-032-C-00-01-200911	0	1	9/11/2020	**22.9**	**6.9**	0.067 U	0.03 U	0.079 U	0.055 U	**16**	0.073 U	0.079 U	0.033 U	**161**	**0.67 J**	**2.8**	**0.85 J**	**4.2**	**10**	**9.7**	**14**	**7.5**	**7.7**	**5**	**12**	**2.8**	**29**	**2.6**	**7.3**
KKR-20-032	KKR-20-032-C-01-03-200911	1	3	9/11/2020	**86**	**23**	0.6 U	0.27 U	0.71 U	0.49 U	**63**	0.65 U	0.7 U	0.29 U	**180**	**0.98**	**1.9**	**1.1**	**4.1**	**12**	**11**	**17**	**8.7**	**8.4**	**5.5**	**16**	**2.8**	**34**	**2.4**	**8**
KKR-20-032	KKR-20-032-C-03-05-200911	3	5	9/11/2020	**7.6**	0.062 U	**7.6**	0.029 U	0.078 U	0.053 U	0.053 U	0.071 U	0.077 U	0.032 U	**267**	**3.7**	**12**	**2**	**7.1**	**13**	**9.6**	**12**	**6.9**	**6.5**	**4.9**	**13**	**2.4**	**52**	**11**	**5.8**
KKR-20-032	KKR-20-032-C-05-6.6-200911	5	6.6	9/11/2020	0.0041 U	0.0065 U	0.0069 U	0.0031 U	0.0081 U	0.0056 U	0.0055 U	0.0074 U	0.008 U	0.0033 U	**89.6**	**0.86**	**1.7**	**0.6**	**4.4**	**7.4**	**5.1 J-**	**5.7 J-**	**2.9 J-**	**2.7 J-**	**1.7 J-**	**7.1**	**0.9 J-**	**18**	**1.8**	**2.6 J-**
KKR-20-033	KKR-20-033-C-00-01-200911	0	1	9/11/2020	**1.4**	**0.23 J-**	0.0046 UJ	0.0021 UJ	0.0054 UJ	0.0037 UJ	**1.2 J-**	0.005 UJ	0.0054 UJ	0.0022 UJ	**78.5**	0.15 U	**0.46 J**	**0.47 J**	**1.2**	**5.2**	**5.8**	**8.6**	**4.4**	**5.2**	**2.5**	**7**	**1.5**	**14**	**0.64**	**4.6**
KKR-20-033	KKR-20-033-C-01-03-200911	1	3	9/11/2020	**1.7**	**0.29**	0.0042 U	0.0019 U	0.005 U	0.0034 U	**1.4**	0.0046 U	0.005 U	0.0021 U	**93**	0.21 U	**0.72 J**	**0.57 J**	**1.7**	**6.4**	**6.4**	**8.9**	**4.9**	**5.6**	**3.1**	**7.8**	**1.9**	**17**	**0.96**	**4.8**
KKR-20-033	KKR-20-033-C-03-05-200911	3	5	9/11/2020	**11.2**	**1.4**	0.043 U	0.019 U	0.051 U	0.035 U	**9.8**	0.047 U	0.051 U	0.021 U	**230**	**0.58**	**2.1**	**1.2**	**4.6**	**15**	**15**	**21**	**11**	**12**	**5.9**	**18**	**3.1**	**47**	**2.7**	**11**
KKR-20-033	KKR-20-033-C-05-07-200911	5	7	9/11/2020	**3.2**	0.0037 U	**3.2 J+**	0.0017 U	0.0046 U	0.0031 U	0.0031 U	0.0042 U	0.0045 U	0.0019 U	**237**	**3**	**2.5**	**2.9**	**7.2**	**15**	**12**	**15**	**8**	**8**	**5.3**	**16**	**2.6**	**34**	**3.8**	**7.5**
KKR-20-033	KKR-20-033-C-07-08-200911	7	8	9/11/2020	**0.086**	0.0044 U	**0.086 J+**	0.0021 U	0.0054 U	0.0037 U	0.0037 U	0.005 U	0.0054 U	0.0022 U	**371**	**4.1**	**2.8**	**6.5**	**7.8**	**26**	**23**	**26**	**14**	**15**	**10**	**26**	**4.8**	**52**	**4.2**	**14**
KKR-20-034	KKR-20-034-C-00-01-200921	0	1	9/21/2020	**6.6**	**1.2**	0.022 U	0.0098 U	0.026 U	0.018 U	**5.4**	0.024 U	0.026 U	0.011 U	**174**	**0.52 J**	**1.5**	**0.86**	**3.4**	**13**	**12**	**16**	**8.8**	**7.9**	**5.6**	**16**	**2.5**	**33**	**2.2**	**7.5**
KKR-20-034	KKR-20-034-C-01-03-200921	1	3	9/21/2020	**0.27**	**0.058**	0.004 UJ	0.0018 UJ	0.0048 UJ	0.0033 UJ	**0.21 J**	0.0044 UJ	0.0047 UJ	0.002 UJ	**167**	**1.7**	**2.3**	**2.2**	**4.7**	**13**	**9.9**	**12**	**6.7**	**5.8**	**4.6**	**13**	**2.2**	**24**	**3.3**	**5.5**
KKR-20-034	KKR-20-034-C-03-05-200921	3	5	9/21/2020	0.0023 U	0.0036 U	0.0038 U	0.0017 U	0.0045 U	0.0031 U	0.0031 U	0.0041 U	0.0045 U	0.0019 U	**174**	**1.8**	**2.8**	**2.1**	**5**	**12**	**9.9**	**13**	**6.8**	**6.2**	**4.2**	**13**	**2.6**	**27**	**3.4**	**5.8**
KKR-20-034	KKR-20-034-C-05-07-200921	5	7	9/21/2020	0.0024 U	0.0038 U	0.004 U	0.0018 U	0.0047 U	0.0032 U	0.0032 U	0.0043 U	0.0046 U	0.0019 U	**136**	**4.4**	**4.3**	**1**	**4.3**	**6.3**	**5.1**	**6.1**	**3.3**	**3**	**2.4**	**6.3**	**1**	**16**	**3.8**	**2.8**
KKR-20-034	KKR-20-034-C-07-9.2-200921	7	9.2	9/21/2020	0.0027 U	0.0042 U	0.0045 U	0.002 U	0.0053 U	0.0036 U	0.0036 U	0.0048 U	0.0052 U	0.0022 U	**98**	**2.7**	**1.9**	**0.84**	**2.6**	**5.5**	**4.4**	**5**	**2.8**	**2.5**	**2**	**5.5**	**0.91**	**14**	**2**	**2.4**
KKR-20-034	KKR-20-034-C-9.2-10-200921	9.2	10	9/21/2020	0.0022 U	0.0035 U	0.0037 U	0.0017 U	0.0044 U	0.003 U	0.003 U	0.004 U	0.0043 U	0.0018 U	**2.4**	**0.079**	**0.062**	0.011 U	0.013 U	0.022 U	0.022 U	0.012 U	0.034 U	0.011 U	0.015 U	0.028 U	0.032 U	0.013 U	**0.022 J**	0.025 U
KKR-20-035	KKR-20-035-C-00-01-200911	0	1	9/11/2020	**0.87**	**0.2 J**	0.0056 U	0.0025 U	0.0066 U	0.0046 U	**0.67**	0.0061 U	0.0066 U	0.0027 U	**70.3**	0.18 U	**0.39 J**	**0.51 J**	**1**	**4.4**	**5.3**	**7.8**	**4.4**	**4.9**	**2.6**	**6.5**	**1.8**	**11**	**0.51 J**	**4.3**
KKR-20-035	KKR-20-035-C-01-03-200911	1	3	9/11/2020	**0.7**	**0.14 J**	0.004 U	0.0018 U	0.0047 U	0.0033 U	**0.56**	0.0044 U	0.0047 U	0.002 U	**89.9**	**0.28 J**	**0.92**	**0.67**	**1.7**	**6.1**	**6.4**	**8.9**	**4.7**	**5.4**	**2.4**	**7.8**	**1.6**	**15**	**0.91**	**4.9**
KKR-20-035	KKR-20-035-C-03-4.9-200911	3	4.9	9/11/2020	0.0022 U	0.0034 UJ	0.0036 UJ	0.0016 UJ	0.0043 UJ	0.003 UJ	0.0029 UJ	0.0039 UJ	0.0043 UJ	0.0018 UJ	0.017 U	0.012 U	0.014 U	0.011 U	0.013 U	0.022 U	0.021 U	0.012 U	0.033 U	0.011 U	0.015 U	0.027 U	0.031 U	0.013 U	0.0096 U	0.024 U
KKR-20-036	KKR-20-036-C-00-01-200911	0	1	9/11/2020	**0.71**	**0.16 J**	0.0057 U	0.0025 U	0.0067 U	0.0046 U	**0.55**	0.0061 U	0.0066 U	0.0028 U	**63.3**	0.18 U	**0.37 J**	**0.49 J**	**0.9**	**4**	**4.6**	**7.1**	**3.9**	**4.6**	**2.4**	**6**	**1.6**	**9.7**	**0.45 J**	**4.2**
KKR-20-036	KKR-20-036-C-01-02-200911	1	2	9/11/2020	**1.6**	**0.41 J**	0.0045 U	0.002 U	0.0053 U	0.0037 U	**1.2 J+**	0.0049 U	0.0053 U	0.0022 U	**97**	**0.2 J**	**0.58 J**	**0.61**	**1.5**	**6.3**	**7.1**	**11**	**5.6**	**6.8**	**3**	**8.7**	**1.9**	**16**	**0.8**	**5.9**
KKR-20-037	KKR-20-037-C-00-01-200921	0	1	9/21/2020	**1.4**	**0.28**	0.0047 U	0.0021 U	0.0056 U	0.0039 U	**1.1**	0.0051 U	0.0056 U	0.0023 U	**91.7**	**0.24 J**	**0.64 J**	**0.51 J**	**1.4**	**5.8**	**6.8**	**9.9**	**5.4**	**6**	**3.3**	**8.3**	**2**	**15**	**0.81 J**	**5.5**
KKR-20-037	KKR-20-037-C-01-03-200921	1	3	9/21/2020	**1.7**	**0.39 J+**	0.0044 U	0.002 U	0.0052 U	0.0036 U	**1.3 J+**	0.0048 U	0.0052 U	0.0022 U	**108**	**0.27 J**	**0.88 J**	**0.65 J**	**2.2**	**7.6**	**7.9**	**10**	**5.9**	**6**	**4.2**	**9.4**	**2**	**19**	**1.2**	**5.3**
KKR-20-037	KKR-20-037-C-03-05-200921	3	5	9/21/2020	**5.6**	**1.4**	0.023 U	0.01 U	0.027 U	0.018 U	**4.2**	0.025 U	0.027 U	0.011 U	**286**	**2.3**	**3.3**	**1.5**	**6.5**	**17**	**18**	**24**	**13**	**13**	**9.1**	**22**	**3.2**	**57**	**4.2**	**12**
KKR-20-037	KKR-20-037-C-05-5.7-200921	5	5.7	9/21/2020	**12.3**	**1.3**	0.044 U	0.02 U	0.052 U	0.036 U	**11**	0.048 U	0.052 U	0.022 U	**366**	**2.1**	**3.4**	**2.2**	**8.7**	**24**	**25**	**33**	**18**	**18**	**12**	**30**	**5**	**68**	**5.2**	**17**
KKR-20-038	KKR-20-038-C-00-01-200910	0	1	9/10/2020	**1.1**	**0.26**	0.0058 UJ	0.0026 UJ	0.0068 UJ	0.0047 UJ	**0.85 J**	0.0063 UJ	0.0068 UJ	0.0028 UJ	**36.2**	0.18 U	0.22 U	**0.33 J**	**0.63 J**	**2.2**	**2.9**	**4.2**	**2.5 J**	**3.2**	**1.5**	**3.4**	**0.77**	**5.2**	**0.3 J**	**2.5**
KKR-20-038	KKR-20-038-C-01-03-200910	1	3	9/10/2020	**1.6**	**0.47**	0.0049 UJ	0.0022 UJ	0.0058 UJ	0.004 UJ	**1

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group									Metals																													Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																													
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	Chromium mg/kg	Mercury mg/kg	Lead mg/kg	Nickel mg/kg	Arsenic mg/kg	Cadmium mg/kg	Copper mg/kg	Zinc mg/kg	Silver mg/kg	Barium mg/kg	Selenium mg/kg	Aluminum mg/kg	Iron mg/kg	Manganese mg/kg	Potassium mg/kg	Sodium mg/kg	Thallium mg/kg	Antimony mg/kg	Beryllium mg/kg	Cobalt mg/kg	Calcium mg/kg	Cyanide mg/kg	Magnesium mg/kg	Vanadium mg/kg	TOC mg/kg	Gravel %	Sand %	Coarse Sand %	Medium Sand %	Fine Sand %	Silt %	Clay %	Fines %
KKR-20-022	KKR-20-022-C-01-03-200914	1	3	9/14/2020	**1.3**	**8**	**11**	**452**	**2.6**	**341**	**21.9**	**10.8**	**3.3**	**97.9**	**474**																										
KKR-20-022	KKR-20-022-C-03-05-200914	3	5	9/14/2020	0.01 U	0.014 U	0.013 U	**15.2**	**0.024**	**7.4**	**16.1**	**1.7**	**0.15**	**13** J+	**45.6**																										
KKR-20-023	KKR-20-023-C-00-01-200914	0	1	9/14/2020	0.33 U	**7.1**	**14**	**41.9**	**0.17**	**86.6**	**21.4**	**4.5**	**1**	**84.4**	**361**																	**78700**								
KKR-20-023	KKR-20-023-G-00-01-200914	0	1	9/14/2020																													0 U	**6.1**	**0.2**	**2.5**	**13.4**	**53.9**	**30**	**83.9**
KKR-20-023	KKR-20-023-C-01-03-200914	1	3	9/14/2020	**0.54** J	**34**	**45**	**119**	**0.56**	**454**	**36.2**	**9.9**	**5.9**	**98**	**495**																	**66800**								
KKR-20-023	KKR-20-023-G-01-03-200914	1	3	9/14/2020																													0 U	**9.8**	**0.8**	**2**	**7**	**55**	**35.2**	**90.2**
KKR-20-023	KKR-20-023-C-03-05-200914	3	5	9/14/2020	**1.9**	**35**	**50**	**297**	**1.6**	**523**	**35.8**	**15.7**	**15.2**	**148**	**894**																	**82300**								
KKR-20-023	KKR-20-023-G-03-05-200914	3	5	9/14/2020																													0 U	**7.6**	**0.7**	**2.8**	**14.1**	**49.8**	**32.6**	**82.4**
KKR-20-023	KKR-20-023-C-05-07-200914	5	7	9/14/2020	**1.1**	**18**	**22**	**2880** J	**7.4**	**510** J	**34.8**	**18** J	**6.4**	**172** J	**1060**																	**85500**								
KKR-20-023	KKR-20-023-G-05-6.2-200914	5	6.2	9/14/2020																													0 U	**16**	**1.5**	**2.9**	**11.6**	**51.7**	**32.3**	**84**
KKR-20-023	KKR-20-023-C-07-8.9-200914	7	8.9	9/14/2020	**2.3**	**19**	**21**	**5530** J	**5.3**	**503** J	**39.7**	**16.8** J	**5.7**	**181** J	**1080**																	**81100**								
KKR-20-024	KKR-20-024-C-00-01-200915	0	1	9/15/2020	**0.26** J	**6.1**	**12**	**66.6**	**0.22**	**140** J	**25**	**5.4**	**1.8**	**76.6** J	**344**																										
KKR-20-024	KKR-20-024-C-01-03-200915	1	3	9/15/2020	**1.2**	**16**	**23**	**210**	**1.2**	**548** J	**44.4**	**15.4**	**8.8**	**124** J	**678**																										
KKR-20-024	KKR-20-024-C-03-05-200915	3	5	9/15/2020	**1.6**	**15**	**19**	**3130**	**2.5**	**405** J	**37.1**	**15.2**	**6.5**	**148** J	**853**																										
KKR-20-024	KKR-20-024-C-05-07-200915	5	7	9/15/2020	**4.2**	**11**	**13**	**1450**	**3.7**	**395** J	**29.4**	**12.8**	**2.4**	**140** J	**708**																										
KKR-20-024	KKR-20-024-C-07-7.5-200915	7	7.5	9/15/2020	**1.2**	**3.9**	**5.1**	**202**	**1.7**	**203** J	**22.5**	**9.3**	**1.1**	**75.4** J	**304**																										
KKR-20-025	KKR-20-025-C-00-1.2-200914	0	1.2	9/14/2020	**0.27** J	**6.2**	**12**	**53.3** J	**0.15**	**122** J	**21.6**	**4.7** J	**1.5**	**75.8** J	**325**																										
KKR-20-025	KKR-20-025-C-1.2-2.6-200914	1.2	2.6	9/14/2020	0.0072 U	**0.094**	**0.11**	**5.4** J	0.01 U	**2.9** J	**4**	**1.3** J	**0.058**	**6.4** J	**14.1**																										
KKR-20-025	KKR-20-025-C-2.6-05-200914	2.6	5	9/14/2020	**0.94**	**3**	**3.8**	**197** J	**1.6**	**295** J	**18.7**	**8.9** J	**1**	**78.1** J	**333**																										
KKR-20-025	KKR-20-025-C-05-5.9-200914	5	5.9	9/14/2020	**0.41**	**1**	**1.1**	**78.7** J	**0.49** J+	**136** J	**20.7**	**7** J	**0.83**	**84.4** J	**318**																										
KKR-20-026	KKR-20-026-C-00-01-200921	0	1	9/21/2020	0.0086 U	0.012 U	0.01 U	**6.3**	0.014 U	**4.3**	**5.9**	**6.2**	**0.086**	**4.6**	**22.1**																										
KKR-20-026	KKR-20-026-C-01-3.2-200921	1	3.2	9/21/2020	0.0082 U	0.011 U	0.01 U	**5.7**	0.013 U	**2.5**	**5.1**	**1.3**	**0.06** J	**3.7**	**16.8**																										
KKR-20-026	KKR-20-026-C-3.2-05-200921	3.2	5	9/21/2020	0.0087 U	0.012 U	0.011 U	**8.4**	0.014 U	**4.3**	**7.8**	**1.3**	**0.091**	**7.6**	**22.5**																										
KKR-20-027	KKR-20-027-C-00-01-200911	0	1	9/11/2020	**0.48** J	**4.7**	**11**	**64.3** J-	**0.16** J+	**135** J-	**24** J-	**6.6**	**1.7**	**86.5** J-	**427**																	**71800**								
KKR-20-027	KKR-20-027-C-01-03-200911	1	3	9/11/2020	**0.24** J	**8.2**	**14**	**56.8** J-	**0.17** J+	**175** J-	**22.9** J-	**5.6**	**2.2**	**78.9** J-	**390**																	**57400**								
KKR-20-027	KKR-20-027-C-03-4.3-200911	3	4.3	9/11/2020	**3**	**14**	**22**	**154** J-	**0.54** J+	**486** J-	**28.9** J-	**13.2**	**7.2**	**96.7** J-	**643**																	**92700**								
KKR-20-028	KKR-20-028-C-00-01-200921	0	1	9/21/2020	**0.056** J	**0.78**	**1.4**	**19**	**0.054** J	**120**	**10.6**	**6.6**	**0.41**	**22**	**57.7**																										
KKR-20-028	KKR-20-028-C-01-03-200921	1	3	9/21/2020	0.0071 U	0.0098 U	0.0087 U	**2.9**	0.01 U	**1.6**	**2.8**	**3.3**	**0.035** J	**1.6**	**9.9**																										
KKR-20-028	KKR-20-028-C-03-05-200921	3	5	9/21/2020	0.0088 U	0.012 U	0.011 U	**3.2**	0.013 U	**1.3**	**2.6**	**4.2**	**0.032** J	**1.8**	**8.4**																										
KKR-20-028	KKR-20-028-C-05-07-200921	5	7	9/21/2020	0.0081 U	0.011 U	0.0099 U	**4.9**	0.013 U	**2.8**	**4.7**	**2.6**	**0.067**	**4.7**	**18.1**																										
KKR-20-028	KKR-20-028-C-07-8.9-200921	7	8.9	9/21/2020	0.0075 U	0.01 U	0.0091 U	**5.1**	0.0095 U	**2.8**	**5.9**	**1.2**	**0.071**	**5.6**	**23.2**																										
KKR-20-028	KKR-20-028-C-8.9-9.7-200921	8.9	9.7	9/21/2020	0.0078 U	0.011 U	0.0095 U	**6.3**	0.0097 U	**3.3**	**6.3**	**1.4**	**0.075**	**5.4**	**22.5**																										
KKR-20-029	KKR-20-029-C-00-01-200911	0	1	9/11/2020	**0.54** J	**5.8**	**12**	**50.4** J-	**0.39** J+	**124** J-	**20.1** J-	**5**	**1.3**	**73.4** J-	**349**																	**76600**								
KKR-20-029	KKR-20-029-G-00-01-200911	0	1	9/11/2020																													**8.5**	**27**	**0.9**	**3.5**	**22.6**	**43.8**	**20.7**	**64.5**
KKR-20-029	KKR-20-029-C-01-03-200911	1	3	9/11/2020	**0.4** J	**11**	**20**	**85.3** J-	**0.3** J+	**397** J-	**29.3** J-	**6.6**	**3.6**	**86** J-	**531**																	**62200**								
KKR-20-029	KKR-20-029-G-01-03-200911	1	3	9/11/2020																													0 U	**6.5**	**0.3**	**2.1**	**14.1**	**58.6**	**24.9**	**83.5**
KKR-20-029	KKR-20-029-C-03-05-200911	3	5	9/11/2020	**0.74** J	**43**	**54**	**310** J-	**0.45** J+	**1090** J-	**27.5** J-	**11.5**	**12.7**	**82.8** J-	**1200**																	**62500**								
KKR-20-029	KKR-20-029-G-03-05-200911	3	5	9/11/2020																													**5**	**13.7**	**0.7**	**2.5**	**10.5**	**47.4**	**33.9**	**81.3**
KKR-20-029	KKR-20-029-C-05-6.1-200911	5	6.1	9/11/2020	**1.1**	**24**	**35**	**116** J-	**0.64** J+	**584** J-	**27.6** J-	**10.7**	**5.8**	**74.4** J-	**451**																	**61600**								
KKR-20-029	KKR-20-029-G-05-5.8-200911	5	5.8	9/11/2020																													0 U	**1.1**	**0.5**	**2.3**	**8.3**	**48.1**	**40.8**	**88.9**
KKR-20-029	KKR-20-029-C-6.1-6.5-200911	6.1	6.5	9/11/2020	0.0074 U	**0.027** J	**0.022** J	**14.9** J-	0.011 U	**8** J-	**14** J-	**3.7**	**0.099**	**12** J-	**32**																	**30300**								
KKR-20-030	KKR-20-030-C-00-01-200911	0	1	9/11/2020	**0.62** J	**8**	**16**	**72.5** J-	**0.21** J+	**200** J-	**23** J-	**6**	**2.1**	**81.2** J-	**399**																	**73800**								
KKR-20-030	KKR-20-030-C-01-2.4-200911	1	2.4	9/11/2020	**0.66** J	**7.9**	**16**	**72.9** J-	**0.27** J+	**220** J-	**28.9** J-	**6.6**	**2.6**	**105** J-	**503**																	**58800**								
KKR-20-031	KKR-20-031-C-00-01-200917	0	1	9/17/2020	0.64 U	**8**	**18**	**169**	**0.39**	**321** J	**65.4**	**35.8**	**5.2** J	**345** J	**1130**																										
KKR-20-031	KKR-20-031-C-01-03-200917	1	3	9/17/2020	**1.7**	**5.4**	**23**	**840**	**1.3**	**716** J	**70.7**	**26.5**	**6.9** J	**633** J	**943**																										
KKR-20-031	KKR-20-031-C-03-4.7-200917	3	4.7	9/17/2020	**1.5**	**6.6** J	**13** J	**844**	**0.87**	**460** J	**32.7**	**51.7**	**7.8** J	**369** J	**792**																										
KKR-20-032	KKR-20-032-C-00-01-200911	0	1	9/11/2020	**3**	**16**	**26**	**180** J-	**0.37** J+	**425** J-	**50.1** J-	**17**	**4.9**	**240** J-	**721**																	**154000**								
KKR-20-032	KKR-20-032-C-01-03-200911	1	3	9/11/2020	**3.8**	**15**	**27**	**569** J-	**0.76** J+	**535** J-	**44.2** J-	**17.7**	**9.8**	**303** J-	**1030**																	**195000**								
KKR-20-032	KKR-20-032-C-03-05-200911	3	5	9/11/2020	**16**	**49**	**40**	**1370** J-	**1.3** J+	**984** J-	**31.1** J-	**32.3**	**17.6**	**335** J-	**1360**																	**279000**								
KKR-20-032	KKR-20-032-C-05-6.6-200911	5	6.6	9/11/2020	**3.1**	**12**	**11**	**3610** J-	**0.5** J+	**196** J-	**14.7** J-	**24.2**	**1.8**	**152** J-	**223**																	**184000**								
KKR-20-033	KKR-20-033-C-00-01-200911	0	1	9/11/2020	**0.32** J	**5.5**	**11**	**58.6** J-	**0.23** J+	**170** J-	**23.9** J-	**5.4**	**2.1**	**90.4** J-	**425**																	**66900**								
KKR-20-033	KKR-20-033-C-01-03-200911	1	3	9/11/2020	**0.41** J	**7.7**	**14**	**110**	**0.35** J+	**366** J-	**31.1**	**6.6**	**3.9**	**106**	**610**																	**57000**								
KKR-20-033	KKR-20-033-C-03-05-200911	3	5	9/11/2020	**2**	**23**	**35**	**835**	**0.47** J+	**960** J-	**35.4**	**11.9**	**11.2**	**115**	**1020**																	**73100**								
KKR-20-033	KKR-20-033-C-05-07-200911	5	7	9/11/2020	**48**	**20**	**26**	**253**	**0.89** J+	**263** J-	**20**	**18.5**	**13.6**	**96.5**	**665**																	**443000**								
KKR-20-033	KKR-20-033-C-07-08-200911	7	8	9/11/2020	**74**	**22**	**39**	**232**	**1.3**	**315** J-	**23.5**	**35.3**	**54.9**	**172**	**1490**																	**278000**								
KKR-20-034	KKR-20-034-C-00-01-200921	0	1	9/21/2020	**1.3**	**16**	**26**	**119**	**0.42** J	**447**	**32**	**8.9**	**4.9**	**86.5**	**392**																										
KKR-20-034	KKR-20-034-C-01-03-200921	1	3	9/21/2020	**23**	**15**	**18**	**255**	**1.3** J	**260**	**17.5**	**13.2**	**2.6**	**86**	**384**																										
KKR-20-034	KKR-20-034-C-03-05-200921	3	5	9/21/2020	**19**	**17**	**22**	**471**	**1.7** J	**251**	**20.2**	**9.8**	**2.9**	**96.8**	**495**																										
KKR-20-034	KKR-20-034-C-05-07-200921	5	7	9/21/2020	**39**	**15**	**12**	**1600**	**2.4** J	**248**	**26.6**	**10.6**	**5**	**90.8**	**800**																										
KKR-20-034	KKR-20-034-C-07-9.2-200921	7	9.2	9/21/2020	**22**	**9.9**	**11**	**1640**	**3.7** J	**257**	**24.7**	**12.6**	**3**	**110**	**552**																										
KKR-20-034	KKR-20-034-C-9.2-10-200921	9.2	10	9/21/2020	**2.1**	**0.029** J	**0.013** J	**16.1**	**0.017** J	**7.2**	**16.4**	**2.1**	**0.16**	**12.3**	**42.3**																										
KKR-20-035	KKR-20-035-C-00-01-200911	0	1	9/11/2020	**0.45** J	**4.5**	**9.8**	**65.9**	**0.15**	**132** J-	**27.7**	**6.5**	**2**	**95.8**	**454**																	**70300**								
KKR-20-035	KKR-20-035-C-01-03-200911	1	3	9/11/2020	**2.3**	**6.9**	**13**	**99.8**	**0.25**	**145** J-	**19.6**	**6.6**	**1.5**	**70.4**	**284**																	**75800**								
KKR-20-035	KKR-20-035-C-03-4.9-200911	3	4.9	9/11/2020	0.0095 U	0.013 U	0.012 U	**16.8**	0.013 U	**7.6** J-	**17.6**	**2.1**	**0.18**	**12.9**	**44.9**																	**38100**								
KKR-20-036	KKR-20-036-C-00-01-200911	0	1	9/11/2020	**0.35** J	**3.5**	**9**	**59.9**	**0.17**	**113** J-	**26.6**	**6.4**	**1.6**	**84.7**	**409**																	**63600**								
KKR-20-036	KKR-20-036-C-01-02-200911	1	2	9/11/2020	**0.74**	**6.3**	**14**	**62.8**	**0.2**	**130** J-	**23**	**5.3**	**1.9**	**74.7**	**329**																	**59300**								
KKR-20-037	KKR-20-037-C-00-01-200921	0	1	9/21/2020	**0.93** J	**6.2**	**13**	**68.2**	**0.22** J	**166**	**25.7**	**5.8**	**2.3**	**92.5**	**415**																										
KKR-20-037	KKR-20-037-C-01-03-200921	1	3	9/21/2020	**0.73** J	**9.2**	**16**	**94.5**	**0.3** J	**255**	**31.2**	**6.6**	**3.1**	**106**	**527**																										
KKR-20-037	KKR-20-037-C-03-05-200921	3	5	9/21/2020	**5.6**	**31**	**43**	**760**	**0.41** J	**809**	**31.3**	**11.2**	**9.4**	**99.9**	**820**																										
KKR-20-037	KKR-20-037-C-05-5.7-200921	5	5.7	9/21/2020	**5.9**	**36**	**52**	**156**	**0.51** J	**670**	**32.8**	**11.4**	**7.4**	**92.8**	**723**																										
KKR-20-038	KKR-20-038-C-00-01-200910	0	1	9/10/2020	**0.28** J	**1.8**	**4.3**	**98**	**0.27** J-	**180**	**26**	**8.1**	**2.7**	**80**	**370**																										
KKR-20-038	KKR-20-038-C-01-03-200910	1	3	9/10/2020	**0.35** J	**2**	**4.4**	**110**	**0.35** J-	**220**	**35**	**9.3**	**3.7**	**110**	**510**																										
KKR-20-038	KKR-20-038-C-03-05-200910	3	5	9/10/2020	**0.18** J	**2.4**	**4.1**	**190** J-	**0.33** J-	**420**	**39**	**11**	**5.7**	**110** J	**710**																										
KKR-20-038	KKR-20-038-C-05-6.3-200910	5	6.3	9/10/2020	**0.98**	**12**	**16**	**510** J-	**0.41** J-	**770**	**32**	**11**	**14**	**86** J	**880**																										
KKR-20-039	KKR-20-039-C-00-01-200910	0	1	9/10/2020	**0.51** J	**4.1**	**9.3**	**75** J-	**0.26** J-	**130**	**26**	**6.2**	**2.2**	**84** J	**400**																										
KKR-20-039	KKR-20-039-C-01-2.5-200910	1	2.5	9/10/2020	**0.74**	**8.3**	**16**	**150** J-	**0.43** J-	**330**	**30**	**7.4**	**4**	**100** J	**580**																										
KKR-20-039	KKR-20-039-C-2.5-05-200910	2.5	5	9/10/2020	0.011 U	0.015 U	**0.014** J	**20** J-	**0.023** J-	**14**	**18**	**2.1**	**0.24**	**14** J	**51**																										
KKR-20-040	KKR-20-040-C-00-01-200910	0	1	9/10/2020	**0.37** J	**3.1**	**7**	**71** J-	**0.26** J-	**130**	**25**	**5.8**	**2.2**	**81** J	**390**																										
KKR-20-040	KKR-20-040-C-01-03-200910	1	3	9/10/2020	**0.66**	**5.5**	**10**	**83** J-	**0.29** J-	**170**	**27**	**6.2**	**2.5**	**90** J	**430**																										
KKR-20-040	KKR-20-040-C-03-4.6-200910	3	4.6	9/10/2020	**1**	**11**	**15**	**200** J-	**0.57** J-	**440**	**34**	**8.9**	**5.9**	**110** J	**660**																										

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB										PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8												
WI CBSQG PEC					3										68.4												
WI CBSQG PEC					5										114												
TSCA					50																						
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KKR-20-040	KKR-20-040-C-4.6-07-200910	4.6	7	9/10/2020	0.0024 U	0.0038 U	0.004 U	0.0018 U	0.0047 U	0.0032 U	0.0032 U	0.0043 U	0.0047 U	0.0019 U	**0.19**	0.013 U	0.016 U	0.012 U	0.014 U	0.024 U	0.023 U	0.013 U	0.037 U	0.012 U	0.016 U	0.03 U	0.034 U	**0.017 J**	0.011 U	0.027 U
KKR-20-041	KKR-20-041-C-00-01-200910	0	1	9/10/2020	**1.9**	**0.24 J+**	0.0049 U	0.0022 U	0.0057 U	0.0039 U	**1.7 J+**	0.0053 U	0.0057 U	0.0024 U	**70.5**	**0.18 J**	**0.41 J**	**0.35 J**	**1.1**	**4.6**	**5.4**	**7.4**	**4**	**5**	**2.3**	**6.6**	**1.2**	**13**	**0.61 J**	**3.9**
KKR-20-041	KKR-20-041-C-01-3.3-200910	1	3.3	9/10/2020	**3.1**	**0.92**	0.0046 UJ	**0.098 J**	0.0054 UJ	0.0037 UJ	**2.1 J**	0.0049 UJ	0.0053 UJ	0.0022 UJ	**111**	**0.44 J**	**1.2**	**0.89**	**3.1**	**7.9**	**7.4**	**9.2**	**5**	**7.1**	**3.3**	**9.3**	**1.7**	**21**	**1.9**	**5.7**
KKR-20-042	KKR-20-042-C-00-01-200911	0	1	9/11/2020	**1.2**	**0.24 J**	0.0047 U	0.0021 U	0.0056 U	0.0038 U	**0.96**	0.0051 U	0.0056 U	0.0023 U	**103**	**0.3 J**	**0.94**	**0.76**	**1.8**	**7.1**	**7.6**	**10**	**5.8**	**6.6**	**4**	**9**	**2**	**17**	**1.1**	**5.9**
KKR-20-042	KKR-20-042-C-01-03-200911	1	3	9/11/2020	**1.3**	**0.31 J**	0.0048 U	0.0022 U	0.0057 U	0.0039 U	**0.97**	0.0052 U	0.0057 U	0.0024 U	**107**	**0.45 J**	**1.1**	**0.63 J**	**2.5**	**7.7**	**7.4**	**10**	**5.3**	**6.5**	**3.6**	**9**	**1.6**	**20**	**1.4**	**5.1**
KKR-20-042	KKR-20-042-C-03-4.2-200911	3	4.2	9/11/2020	**3.2**	**0.6 J**	0.0042 U	0.0019 U	0.0049 U	0.0034 U	**2.6**	0.0045 U	0.0049 U	0.002 U	**162**	**1.2**	**1.9**	**1.1**	**4.3**	**12**	**11**	**15**	**7.3**	**9.3**	**4.8**	**13**	**2.5**	**28**	**2.5**	**7.6**
KKR-20-043	KKR-20-043-C-00-01-200910	0	1	9/10/2020	**4.6**	**1.2 J-**	0.0048 UJ	0.0021 UJ	0.0056 UJ	0.0039 UJ	**3.4 J**	0.0052 UJ	0.0056 UJ	0.0023 UJ	**180**	**0.79**	**1.9**	**1.9**	**4.2**	**13**	**12**	**15**	**8.7**	**7.8**	**6.7**	**15**	**2.2**	**34**	**2.6**	**7.2**
KKR-20-043	KKR-20-043-C-01-03-200910	1	3	9/10/2020	**6**	**1.3**	0.0047 UJ	0.0021 UJ	0.0055 UJ	0.0038 UJ	**4.7 J**	0.0051 UJ	0.0055 UJ	0.0023 UJ	**226**	**1.1**	**3.6**	**1.5**	**6.5**	**14**	**14**	**18**	**9.3**	**9**	**6.3**	**16**	**2.6**	**42**	**4.7**	**8.4**
KKR-20-043	KKR-20-043-C-03-5.1-200910	3	5.1	9/10/2020	**7.5**	**1.3**	0.04 U	0.018 U	0.047 U	0.032 U	**6.2**	0.043 U	0.047 U	0.019 U	**203**	**1.6**	**4.9**	**2.6**	**8.8**	**14**	**11**	**13**	**7**	**5.7**	**5.3**	**15**	**2**	**35**	**6.2**	**5.7**
KKR-20-043	KKR-20-043-C-5.1-7.1-200910	5.1	7.1	9/10/2020	0.0027 U	0.0043 UJ	0.0045 UJ	0.002 UJ	0.0053 UJ	0.0037 UJ	0.0036 UJ	0.0049 UJ	0.0053 UJ	0.0022 UJ	**0.38**	0.015 U	0.018 U	0.014 U	0.016 U	**0.028 J**	**0.028 J**	**0.028 J**	0.042 U	**0.023 J**	0.019 U	0.034 U	0.04 U	**0.052 J**	0.012 U	0.031 U
KKR-20-044	KKR-20-044-C-00-01-200910	0	1	9/10/2020	**0.57**	**0.15**	0.0055 U	0.0025 U	0.0065 U	0.0045 U	**0.42**	0.006 U	0.0065 U	0.0027 U	**76.7**	**0.29 J**	**0.67**	**1.2**	**2.7**	**6.1**	**5.4**	**7.2**	**3.9**	**3.8**	**2.5**	**6.7**	**1.3**	**12**	**1**	**3.4**
KKR-20-044	KKR-20-044-C-01-03-200910	1	3	9/10/2020	**1.1**	**0.26**	0.005 U	0.0022 U	0.0058 U	0.004 U	**0.79**	0.0054 U	0.0058 U	0.0024 U	**87.1**	**0.49**	**0.74**	**0.86**	**2**	**6.2**	**6.4**	**8.5**	**4.7**	**4.8**	**3.5**	**7.4**	**1.4**	**14**	**1.1**	**4.4**
KKR-20-044	KKR-20-044-C-03-04-200910	3	4	9/10/2020	**4.8**	**0.95**	0.0045 U	0.002 U	0.0053 U	0.0036 U	**3.8**	0.0049 U	0.0053 U	0.0022 U	**157**	**1.1**	**2.3**	**1.4**	**5.5**	**10**	**8.9**	**11**	**6.1**	**5.9**	**4.5**	**11**	**1.7**	**31**	**3.3**	**5.3**
KKR-20-044	KKR-20-044-C-04-05-200910	4	5	9/10/2020	0.0025 U	0.004 U	0.0042 U	0.0019 U	0.005 U	0.0034 U	0.0034 U	0.0046 U	0.005 U	0.0021 U	0.02 U	0.014 U	0.017 U	0.013 U	0.015 U	0.026 U	0.025 U	0.014 U	0.039 U	0.012 U	0.017 U	0.032 U	0.037 U	0.015 U	0.011 U	0.029 U
KKR-20-045	KKR-20-045-C-00-0.4-200910	0	0.4	9/10/2020	**0.59**	**0.19 J+**	0.0046 U	0.0021 U	0.0055 U	0.0038 U	**0.4 J+**	0.005 U	0.0054 U	0.0023 U	**20.7**	**0.13 J**	**0.15 J**	**0.29**	**0.4**	**1.3**	**1.7**	**2.4**	**1.3**	**1.4**	**0.87**	**1.9**	**0.42**	**2.7**	**0.24**	**1.3**
KKR-20-045	KKR-20-045-C-0.4-01-200910	0.4	1	9/10/2020	0.0027 U	0.0042 U	0.0045 U	0.002 U	0.0053 U	0.0036 U	0.0036 U	0.0048 U	0.0052 U	0.0022 U	**0.2**	0.014 U	0.017 U	0.013 U	0.016 U	0.027 U	0.026 U	0.015 U	0.041 U	0.013 U	0.018 U	0.033 U	0.038 U	0.016 U	**0.012 J**	0.03 U
KKR-20-046	KKR-20-046-C-00-01-200911	0	1	9/11/2020	**1.3**	**0.23 J**	0.0042 U	0.0019 U	0.005 U	0.0034 U	**1.1**	0.0046 U	0.0049 U	0.0021 U	**89.3**	**0.63**	**0.78**	**0.96**	**2.5**	**7.6**	**6.7**	**8.1**	**4.3**	**4.7**	**3.1**	**8.6**	**1.4**	**14**	**1.4**	**4.1**
KKR-20-046	KKR-20-046-C-01-03-200911	1	3	9/11/2020	**0.48**	**0.049 J+**	0.0036 U	0.0016 U	0.0042 U	0.0029 U	**0.43 J+**	0.0039 U	0.0042 U	0.0017 U	**155**	**1.6**	**7.6**	**1.5**	**6.5**	**12**	**8.8**	**9.4**	**5.3**	**5.5**	**4.1**	**11**	**1.7**	**24**	**4.7**	**4.5**
KKR-20-046	KKR-20-046-C-03-05-200911	3	5	9/11/2020	0.0021 U	0.0033 UJ	0.0035 UJ	0.0016 UJ	0.0041 UJ	0.0028 UJ	0.0028 UJ	0.0038 UJ	0.0041 UJ	0.0017 UJ	**56.5**	**0.93**	**0.86**	**0.68**	**2**	**4.6**	**3.4**	**4.2**	**2**	**2**	**1.2**	**4.4**	**0.63**	**8.2 J**	**1**	**1.8**
KKR-20-046	KKR-20-046-C-05-07-200911	5	7	9/11/2020	0.0025 U	0.004 UJ	0.0042 UJ	0.0019 UJ	0.0049 UJ	0.0034 UJ	0.0033 UJ	0.0045 UJ	0.0049 UJ	0.002 UJ	**206**	**5.6**	**4.4**	**2.1**	**6.5**	**12**	**9.2**	**9.8**	**5.3**	**5.2**	**4.5**	**11**	**1.6**	**29**	**4**	**4.8**
KKR-20-046	KKR-20-046-C-07-8.6-200911	7	8.6	9/11/2020	0.0027 U	0.0043 UJ	0.0046 UJ	0.002 UJ	0.0054 UJ	0.0037 UJ	0.0036 UJ	0.0049 UJ	0.0053 UJ	0.0022 UJ	**250**	**4.1**	**4.5**	**2.7**	**9.2**	**17**	**13**	**14**	**7.3**	**7.4**	**6**	**15**	**2.3**	**39**	**4.4**	**7**
KKR-20-047	KKR-20-047-C-00-01-200917	0	1	9/17/2020	**0.36**	**0.094 J**	0.0028 UJ	0.0012 UJ	0.0033 UJ	0.0023 UJ	**0.27**	0.003 UJ	0.0033 UJ	0.0014 UJ	**28.9**	**0.19 J**	**0.21 J**	**0.31 J**	**0.58**	**1.8**	**2.5**	**3.1**	**1.8 J**	**2.3**	**1.4**	**2.7**	**0.68**	**3.9**	**0.26 J**	**1.9**
KKR-20-047	KKR-20-047-C-01-03-200917	1	3	9/17/2020	**0.72**	**0.18 J**	0.0024 UJ	0.0011 UJ	0.0029 UJ	0.002 UJ	**0.54 J-**	0.0026 UJ	0.0028 UJ	0.0012 UJ	**61.7**	**0.26 J**	0.19 U	**0.49 J**	**1.5**	**5.2**	**5.6**	**6.8**	**3.8**	**4.9**	**2.4**	**6.3**	**1.1**	**8**	**0.58 J**	**3.8**
KKR-20-047	KKR-20-047-C-03-3.9-200917	3	3.9	9/17/2020	**1.7**	**0.33 J**	0.0023 UJ	0.001 UJ	0.0027 U	0.0018 UJ	**1.4**	0.0024 UJ	0.0026 UJ	0.0011 UJ	**39.2**	**0.28 J**	**0.24 J**	**0.47**	**0.91**	**2.9**	**3.1**	**4**	**2.4**	**3**	**1.6**	**3.5**	**0.8**	**5.4**	**0.46**	**2.4**
KKR-20-047	KKR-20-047-C-3.9-4.8-200917	3.9	4.8	9/17/2020	0.0012 U	0.0018 UJ	0.0019 UJ	0.00086 UJ	0.0023 U	0.0016 UJ	0.0015 U	0.0021 UJ	0.0023 UJ	0.00094 UJ	0.017 U	0.012 U	0.015 U	0.011 U	0.013 U	0.023 U	0.022 U	0.012 U	0.034 U	0.011 U	0.015 U	0.028 U	0.032 U	0.013 U	0.0099 U	0.025 U
KKR-20-048	KKR-20-048-C-00-01-200922	0	1	9/22/2020	**0.59**	**0.14**	0.0026 UJ	0.0012 UJ	0.0031 UJ	0.0021 UJ	**0.45 J**	0.0029 UJ	0.0031 UJ	0.0013 UJ	**96.9**	**0.45 J**	**0.86**	**0.71 J**	**2.5**	**7.1**	**7.4**	**9**	**5.2**	**5.6**	**3.7**	**7.8**	**1.6**	**15**	**1.1**	**5.1**
KKR-20-048	KKR-20-048-C-01-1.8-200922	1	1.8	9/22/2020	**0.56**	**0.13**	0.0025 UJ	0.0011 UJ	0.0029 UJ	0.002 UJ	**0.43 J**	0.0027 UJ	0.0029 UJ	0.0012 UJ	**47.4**	**0.35 J**	**0.27 J**	**0.53 J**	**0.95**	**3.4**	**3.8**	**5**	**2.9 J**	**2.9**	**2.1**	**4.3**	**1.3**	**6.1**	**0.5 J**	**2.7**
KKR-20-048	KKR-20-048-C-1.8-2.3-200922	1.8	2.3	9/22/2020	**0.074**	**0.0089 J**	0.0015 UJ	0.00067 UJ	0.0018 UJ	0.0012 UJ	**0.065 J**	0.0016 UJ	0.0018 UJ	0.00073 UJ	**0.53**	0.0095 U	**0.015 J**	0.0086 U	**0.013 J**	**0.04**	**0.039 J**	**0.045**	**0.032 J**	**0.027 J**	**0.022 J**	**0.052**	0.025 U	**0.066**	**0.011 J**	**0.023 J**
KKR-20-049	KKR-20-049-C-00-01-200923	0	1	9/23/2020	**0.33**	**0.098 J**	0.0048 U	0.0021 U	0.0056 U	0.0039 U	**0.23**	0.0052 U	0.0056 U	0.0023 U	**84.3**	**0.62**	**0.77**	**1.6**	**2.3**	**7.3**	**6.6**	**7.5**	**4.4**	**4**	**3.2**	**7.6**	**1.4**	**13**	**1.2**	**3.7**
KKR-20-049	KKR-20-049-G-00-01-200923	0	1	9/23/2020																										
KKR-20-049	KKR-20-049-C-01-03-200923	1	3	9/23/2020	**0.5**	**0.089 J**	0.0048 U	0.0021 U	0.0056 U	0.0039 U	**0.41**	0.0052 U	0.0056 U	0.0023 U	**70.8**	**0.5**	**0.74**	**1.3**	**2**	**6.6**	**5.3**	**6.1**	**3.4**	**3.1**	**2.5**	**6.2**	**1.1**	**11**	**0.98**	**2.8**
KKR-20-049	KKR-20-049-G-01-03-200923	1	3	9/23/2020																										
KKR-20-049	KKR-20-049-C-03-3.8-200923	3	3.8	9/23/2020	0.0026 U	0.0042 U	0.0044 U	0.002 U	0.0052 U	0.0036 U	0.0036 U	0.0048 U	0.0052 U	0.0022 U	**17.4**	**0.11 J**	**0.3**	**0.27**	**0.64**	**1.5**	**1.1**	**1.4**	**0.69 J**	**0.61**	**0.46**	**1.4**	**0.33**	**2.8**	**0.28**	**0.6**
KKR-20-049	KKR-20-049-G-03-3.8-200923	3	3.8	9/23/2020																										
KKR-20-050	KKR-20-050-C-00-01-200922	0	1	9/22/2020	**0.38**	**0.077**	0.0019 UJ	0.00085 UJ	0.0022 UJ	0.0015 UJ	**0.3 J**	0.0021 UJ	0.0022 UJ	0.00092 UJ	**45.9**	**0.3 J**	**0.38 J**	**0.69**	**1.2**	**3.7**	**3.5**	**4.5**	**2.5**	**2.4**	**1.8**	**4.2**	**1.1**	**6.5**	**0.52**	**2.2**
KKR-20-050	KKR-20-050-C-01-1.7-200922	1	1.7	9/22/2020	**0.96**	**0.2 J+**	0.002 UJ	0.0009 UJ	0.0024 UJ	0.0016 UJ	**0.76 J**	0.0022 UJ	0.0024 UJ	0.00098 UJ	**36**	**0.25 J**	**0.3 J**	**0.49 J**	**0.85**	**2.8**	**2.7**	**3.9**	**2.2 J**	**2**	**1.3**	**3.2**	**0.94**	**5**	**0.41 J**	**1.8**
KKR-20-051	KKR-20-051-C-00-01-200922	0	1	9/22/2020	**0.91**	**0.23**	0.003 UJ	0.0014 UJ	0.0036 UJ	0.0025 UJ	**0.68 J**	0.0033 UJ	0.0035 UJ	0.0015 UJ	**32.6**	**0.21 J**	0.23 U	**0.41 J**	**0.52 J**	**2.1**	**2.8**	**3.9**	**2.3 J**	**2.4**	**1.5**	**2.8**	**1.1**	**3.8**	**0.32 J**	**2.1**
KKR-20-051	KKR-20-051-C-01-2.3-200922	1	2.3	9/22/2020	**1.7**	**0.3**	0.002 UJ	0.00092 UJ	0.0024 UJ	0.0017 UJ	**1.4 J**	0.0022 UJ	0.0024 UJ	0.001 UJ	**25.5**	**0.16 J**	**0.18 J**	**0.33 J**	**0.5 J**	**1.9**	**2**	**2.7**	**1.7 J**	**1.5**	**1.1**	**2.3**	**0.74**	**3.4**	**0.29 J**	**1.3**
KKR-20-052	KKR-20-052-C-00-01-200909	0	1	9/9/2020	**0.92**	**0.18**	0.0051 U	0.0023 U	0.006 U	0.0041 U	**0.74**	0.0055 U	0.0059 U	0.0025 U	**36.2**	**0.2 J**	**0.28 J**	**0.59 J**	**0.74**	**2.3**	**2.8**	**4.1**	**2.5 J**	**2.9**	**1.7**	**3.1**	**0.86**	**4.7**	**0.44 J**	**2.4**
KKR-20-052	KKR-20-052-C-01-03-200909	1	3	9/9/2020	**2.4**	**0.25**	0.0046 U	0.0021 U	0.0055 U	0.0038 U	**2.1**	0.005 U	0.0054 U	0.0023 U	**46.8**	**0.33 J**	**0.48 J**	**0.59 J**	**1.1**	**3.3**	**3.8**	**5**	**3 J**	**3.3**	**2**	**3.9**	**0.89**	**6.7**	**0.63**	**2.8**
KKR-20-052	KKR-20-052-C-03-3.5-200909	3	3.5	9/9/2020	0.0021 U	0.0033 UJ	0.0035 UJ	0.0016 UJ	0.0041 UJ	0.0029 UJ	0.0028 UJ	0.0038 UJ	0.0041 UJ	0.0017 UJ	**63.4**	**0.8**	**0.62**	**0.86**	**1.9**	**5.6**	**4.5**	**5.1**	**2.9**	**3.2**	**2.1**	**6.1**	**0.96**	**11**	**0.79**	**2.5**
KKR-20-053	KKR-20-053-C-00-01-200909	0	1	9/9/2020	**3.1**	**0.38**	0.0052 U	0.0023 U	0.0061 U	0.0042 U	**2.7**	0.0056 U	0.006 U	0.0025 U	**55.6**	**0.34 J**	**0.38**	**0.67**	**1.3**	**4.1**	**4.5**	**6.4**	**3.3**	**4.1**	**1.7**	**5.3**	**0.93**	**8.3**	**0.58**	**3**
KKR-20-053	KKR-20-053-C-01-03-200909	1	3	9/9/2020	**7.2**	**0.76**	0.047 U	0.021 U	0.056 U	0.038 U	**6.4**	0.051 U	0.055 U	0.023 U	**72.1**	**0.33**	**0.5**	**0.82**	**1.7**	**5.3**	**5.8**	**7.7**	**4.3**	**5.1**	**2.9**	**6.9**	**1.3**	**11**	**0.76**	**4**
KKR-20-053	KKR-20-053-C-03-05-200909	3	5	9/9/2020	**0.83**	**0.1**	0.0047 U	0.0021 U	0.0055 U	0.0038 U	**0.73**	0.0051 U	0.0055 U	0.0023 U	**62.7**	**0.46**	**0.45**	**1.1**	**1.8**	**5.4**	**5.1**	**5.8**	**3.5**	**3.7**	**2.6**	**5.9**	**1.2**	**9.6**	**0.77**	**3**
KKR-20-053	KKR-20-053-C-05-5.4-200909	5	5.4	9/9/2020	0.0018 U	0.0029 U	0.0031 U	0.0014 U	0.0036 U	0.0025 U	0.0025 U	0.0034 U	0.0036 U	0.0015 U	0.014 U	0.01 U	0.012 U	0.0091 U	0.011 U	0.019 U	0.018 U	0.01 U	0.028 U	0.009 U	0.012 U	0.023 U	0.027 U	0.011 U	0.0082 U	0.021 U
KKR-20-054	KKR-20-054-C-00-01-200924	0	1	9/24/2020	**0.87**	**0.28**	0.006 U	0.0027 U	0.0071 U	0.0049 U	**0.59**	0.0065 U	0.007 U	0.0029 U	**42.3**	**0.26 J**	**0.19 J**	**0.5**	**0.75**	**2.9**	**3.6**	**5.2**	**2.8**	**2.7**	**1.8**	**3.7**	**0.96**	**4.8**	**0.38 J**	**2.4**
KKR-20-054	KKR-20-054-C-01-03-200924	1	3	9/24/2020	**1.5**	**0.38**	0.0052 U	0.0023 U	0.0062 U	0.0043 U	**1.1**	0.0057 U	0.0061 U	0.0026 U	**54.4**	**0.34 J**	**0.3 J**	**0.71**	**1.1**	**4**	**4.4**	**6.1**	**3.4**	**3.1**	**2.4**	**5**	**1.4**	**6.8**	**0.51 J**	**2.9**
KKR-20-054	KKR-20-054-C-03-05-200924	3	5	9/24/2020	**6.2**	**1.2**	0.046 U	0.021 U	0.055 U	0.038 U	**5**	0.05 U	0.054 U	0.023 U	**87.5**	**0.51 J**	**0.48 J**	**1.1**	**2**	**6.7**	**7.2**	**9.9**	**5.2**	**4.7**	**3.2**	**8.4**	**1.4**	**12**	**0.91**	**4.4**
KKR-20-054	KKR-20-054-C-05-7.1-200924	5	7.1	9/24/2020	**11.3**	**1.9**	0.05 U	0.022 U	0.059 U	0.04 U	**9.4**	0.054 U	0.058 U	0.024 U	**127**	**0.57 J**	**0.8**	**1.8**	**3**	**11**	**9.7**	**13**	**7.3**	**6.6**	**5.6**	**12**	**2.3**	**18**	**1.4**	**6.3**
KKR-20-055	KKR-20-055-C-00-01-200923	0	1	9/23/2020	**2.4**	**0.5**	0.0048 U	0.0021 U	0.0057 U	0.0039 U	**1.9**	0.0052 U	0.0056 U	0.0023 U	**33.8**	**0.18 J**	**0.25 J**	**0.41**	**0.73**	**2.5**	**2.6**	**3.6**	**1.9**	**1.9**	**1.2**	**3.1**	**0.72**	**5**	**0.38**	**1.7**
KKR-20-055	KKR-20-055-C-01-03-200923	1	3	9/23/2020	**4.9**	**0.82**	0.0051 U	0.0023 U	0.006 U	0.0041 U	**4.1**	0.0055 U	0.0059 U	0.0025 U	**45.3**	**0.24 J**	**0.28 J**	**0.58**	**0.99**	**3.6**	**3.6**	**5.1**	**2.8**	**2.5**	**1.6**	**4.3**	**0.92**	**6.2**	**0.46**	**2.3**
KKR-20-055	KKR-20-055-C-03-05-200923	3	5	9/23/2020	**6.3**	**1.2**	0.0052 U	0.0023 U	0.0061 U	0.0042 U	**5.1**	0.0056 U	0.0061 U	0.0025 U	**67**	**0.37**	**0.43**	**0.93**	**1.6**	**5.1**	**5.2**	**7.2**	**4**	**3.7**	**2.5**	**6.5**	**1.3**	**9.8**	**0.69**	**3.4**
KKR-20-055	KKR-20-055-C-05-5.6-200923	5	5.6	9/23/2020	**6.1**	**0.81**	0.0052 U	0.0023 U	0.0061 U	0.0042 U	**5.3**	0.0056 U	0.0061 U	0.0025 U	**65.6**	**0.31 J**	**0.4**	**0.83**	**1.4**	**5.2**	**5.3**	**7.3**	**4.1**	**3.8**	**2.4**	**6.1**	**1.3**	**9.8**	**0.59**	**3.6**
KKR-20-056	KKR-20-056-C-00-0.9-200923	0	0.9	9/23/2020	0.0026 U	0.0042 U	0.0044 U	0.002 U	0.0052 U	0.0036 U	0.0035 U	0.0048 U	0.0051 U	0.0021 U	**0.2**	0.014 U	0.017 U	0.013 U	0.015 U	0.027 U	0.026 U	0.015 U	0.04 U	0.013 U	0.018 U	0.033 U	0.038 U	**0.018 J**	0.012 U	0.03 U
KKR-20-057	KKR-20-057-C-00-01-200923	0	1	9/23/2020	**0.92**	**0.2**	0.0042 U	0.0019 U	0.0049 U	0.0034 U	**0.72**	0.0045 U	0.0049 U	0.002 U	**0.19**	0.013 U	**0.027 J**	0.012 U	0.014 U	0.025 U	0.024 U	0.014 U	0.037 U	0.012 U	0.017 U	0.031 U	0.035 U	0.015 U	0.011 U	0.027 U
KKR-20-058	KKR-20-058-C-00-0.8-200922	0	0.8	9/22/2020	**0.43**	**0.093**	0.0027 UJ	0.0012 UJ	0.0032 UJ	0.0022 UJ	**0.34 J**	0.0029 UJ	0.0031 UJ	0.0013 UJ	**14.3**	**0.089 J**	**0.15 J**	**0.14 J**	**0.33**	**1**	**1**	**1.4**	**0.79 J**	**0.77**	**0.53**	**1.2**	**0.38**	**2.1**	**0.21 J**	**0.7**
KKR-20-059	KKR-20-059-C-00-01-200909	0	1	9/9/2020	**1.5**	**0.25**	0.0048 U	0.0021 U	0.0056 U	0.0039 U	**1.2**	0.0052 U	0.0056 U	0.0023 U	**56.8**	**0.25 J**	**0.32 J**	**0.48**	**0.89**	**3.9**	**4.6**	**6.1**	**3.4**	**4.3**	**2.1**	**5.3**	**1.1**	**8.9**	**0.49**	**3.5**
KKR-20-059	KKR-20-059-C-01-03-200909	1	3	9/9/2020	**0.89**	**0.15**	0.005 U	0.0023 U	0.0059 U	0.0041 U	**0.74**	0.0055 U	0.0059 U	0.0025 U	**44.4**	**0.33 J**	**0.36**	**0.59**	**0.97**	**3**	**3.6**	**4.8**	**2.7**	**3.3**	**1.6**	**4**	**0.81**	**6.1**	**0.59**	**2.6**
KKR-20-059	KKR-20-059-C-03-4.1-200909	3	4.1	9/9/2020	**4.6**	**0.54**	0.046 U	0.021 U	0.054 U	0.037 U	**4.1**	0.05 U	0.054 U	0.022 U	**111**	**0.7**	**0.89**	**1.7**	**4**	**9.2**	**8.2**	**9.7**	**5.2**	**5.9**	**3.3**	**10**	**1.9**	**19**	**1.7**	**4.9**
KKR-20-059	KKR-20-059-C-4.1-5.2-200909	4.1	5.2	9/9/2020	0.0024 U	0.0038 U	0.004 U	0.0018 U	0.0048 U	0.0033 U	0.0032 U	0.0044 U	0.0047 U	0.002 U	**0.18**	0.013 U	0.015 U	0.012 U	0.014 U	0.024 U	0.023 U	0.013 U	0.036 U	0.011 U	0.016 U	0.029 U	0.034 U	**0.015 J**	0.01 U	0.026 U
KKR-20-060	KKR-20-060-C-00-01-200904	0	1	9/4/2020	**2.9**	**0.66**	0.0062 U	0.0028 U	0.0073 U	0.005 U	**2.2**	0.0067 U	0.0072 U	0.003 U	**93.6**	**1**	**0.55**	**1.3**	**2.4**	**7.2**	**6.9**	**9.9**	**5.5**	**6.5**	**3.2**	**9**	**1.9**	**14**	**0.97**	**5.1**
KKR-20-060	KKR-20-060-C-01-03-200904	1	3	9/4/2020	**0.28**	0.0042 U	**0.28**	0.002 U	0.0053 U	0.0036 U	0.0036 U	0.0049 U	0.0052 U	0.0022 U	**118**	**1.4**	**0.87**	**2.2**	**2.7**	**10**	**10**	**13**	**6.7**	**8.1**	**2.9**	**11**	**2.1**	**17**	**1**	**6.2**
KKR-20-060	KKR-20-060-C-03-05-200904	3	5	9/4/2020	**0.099**	**0.071 J-**	0.0046 UJ	**0.028 J-**	0.0054 UJ	0.0037 UJ	0.0037 UJ	0.0049 UJ	0.0054 UJ	0.0022 UJ	**114**	**1.6**	**0.51 J**	**2.1**	**2.8**	**11**	**9.8**	**11**	**6.5**	**6.1**	**3.6**	**11**	**2**	**16**	**0.99**	**5.1**
KKR-20-060	KKR-20-060-C-05-6.8-200904	5	6.8	9/4/2020	**0.031**	**0.021 J-**	0.0046 UJ	**0.0095 J-**	0.0054 UJ	0.0037 UJ	0.0036 UJ	0.0049 UJ	0.0053 UJ	0.0022 UJ	**78.3**	**1.3**	**0.51**	**1.3**	**2.1**	**7.6**	**6**	**6.6**	**3.9**	**4.3**	**2.8**	**7.8**	**1.1**	**12**	**0.85**	**3.5**
KKR-20-060	KKR-20-060-C-6.8-8.8-200904	6.8	8.8	9/4/2020	0.0025 U	0.004 U	0.0042 U	0.0019 U	0.0049 U	0.0034 U	0.0033 U	0.0045 U	0.0049 U	0.002 U	0.019 U	0.014 U	0.016 U	0.012 U	0.015 U	0.025 U	0.024 U	0.014 U	0.038 U	0.012 U	0.017 U	0.031 U	0.036 U	0.015 U	0.011 U	0.028 U
KKR-20-061	KKR-20-061-C-00-01-200904	0	1	9/4/2020	**1.8**	**0.44**	0.0062 U	0.0028 U	0.0073 U	0.005 U	**1.4**	0.0067 U	0.0072 U	0.003 U	**44.9**	**0.25 J**	**0.37 J**	**0.47**	**0.78**	**3.3**	**3.6**	**4.8**	**2.7**	**3.7**	**1.9**	**3.8**	**0.78**	**6.6**	**0.4 J**	**2.8**
KKR-20-061	KKR-20-061-C-01-03-200904	1	3	9/4/2020	**4.3**	**0.91 J-**	0.0057 UJ	0.0026 UJ	0.0067 UJ	0.0046 UJ	**3.4 J-**	0.0062 UJ	0.0067 UJ	0.0028 UJ	**79.3**	**0.48**	**0.45**	**0.74**	**1.5**	**5.9**	**6.1**	**9**	**4.7**	**5.3**	**2.8**	**7.3**	**1.5**	**13**	**0.59**	**4.6**
KKR-20-061	KKR-20-061-C-03-05-200904	3	5	9/4/2020	**6.3**	**1.1**	0.025 U

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																		Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100		25																	
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300		75																	
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500		125																	
TSCA																																								
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
KKR-20-040	KKR-20-040-C-4.6-07-200910	4.6	7	9/10/2020	0.011 U	0.014 U	**0.015 J**	**18 J-**	**0.022 J-**	**8**	**19**	**2.2**	**0.16**	**14 J**	**46**																									
KKR-20-041	KKR-20-041-C-00-01-200910	0	1	9/10/2020	**0.41 J**	**4.8**	**9.2**	**83 J-**	**0.026 J-**	**180**	**28**	**6.2**	**2.6**	**94 J**	**480**																									
KKR-20-041	KKR-20-041-C-01-3.3-200910	1	3.3	9/10/2020	**0.96**	**11**	**14**	**160 J-**	**0.43**	**420**	**33**	**8**	**5.4**	**100 J**	**640**																									
KKR-20-042	KKR-20-042-C-00-01-200911	0	1	9/11/2020	**0.82**	**7.6**	**15**	**83.4**	**0.24**	**189 J-**	**28.4**	**6.1**	**2.5**	**91.4**	**425**																	**67500**								
KKR-20-042	KKR-20-042-C-01-03-200911	1	3	9/11/2020	**0.83**	**10**	**14**	**135**	**0.27**	**263 J-**	**32.5**	**6.9**	**3.5**	**107**	**561**																	**65100**								
KKR-20-042	KKR-20-042-C-03-4.2-200911	3	4.2	9/11/2020	**3.1**	**16**	**21**	**210**	**0.33**	**410 J-**	**25.1**	**7.8**	**6.1**	**71.8**	**557**																	**173000**								
KKR-20-043	KKR-20-043-C-00-01-200910	0	1	9/10/2020	**2.5**	**17**	**28**	**290 J-**	**0.4**	**520**	**26**	**8.6**	**6.2**	**85 J**	**630**																									
KKR-20-043	KKR-20-043-C-01-03-200910	1	3	9/10/2020	**3.8**	**31**	**34**	**330**	**0.45**	**470**	**26**	**8.8**	**6.9**	**69 J+**	**560**																									
KKR-20-043	KKR-20-043-C-03-5.1-200910	3	5.1	9/10/2020	**6.5**	**33**	**26**	**78 J-**	**0.36**	**210**	**23**	**7.8**	**3**	**46 J**	**260**																									
KKR-20-043	KKR-20-043-C-5.1-7.1-200910	5.1	7.1	9/10/2020	0.012 U	**0.043 J**	**0.055 J**	**14 J-**	**0.02 J**	**6.2**	**13**	**2**	**0.27**	**13 J**	**49**																									
KKR-20-044	KKR-20-044-C-00-01-200910	0	1	9/10/2020	**1.3**	**7.2**	**10**	**81 J-**	**0.41**	**140**	**20**	**5.8**	**2.1**	**59 J**	**290**																									
KKR-20-044	KKR-20-044-C-01-03-200910	1	3	9/10/2020	**1.9**	**6.7**	**12**	**150 J-**	**0.42 J-**	**200**	**26**	**7.4**	**3.8**	**86 J**	**430**																									
KKR-20-044	KKR-20-044-C-03-04-200910	3	4	9/10/2020	**5**	**21**	**22**	**320 J-**	**0.59 J-**	**410**	**28**	**9.9**	**7.8**	**77 J**	**510**																									
KKR-20-044	KKR-20-044-C-04-05-200910	4	5	9/10/2020	0.011 U	0.016 U	0.014 U	**16 J-**	**0.025 J-**	**7**	**16**	**2**	**0.21**	**14 J**	**48**																									
KKR-20-045	KKR-20-045-C-00-0.4-200910	0	0.4	9/10/2020	**0.62**	**1.1**	**2.5**	**44**	**0.18 J-**	**280**	**12**	**4.2**	**1.1**	**30**	**150**																									
KKR-20-045	KKR-20-045-C-0.4-01-200910	0.4	1	9/10/2020	0.012 U	**0.02 J**	0.014 U	**15**	**0.028 J-**	**6.9**	**12**	**2.2**	**0.27**	**12**	**47**																									
KKR-20-046	KKR-20-046-C-00-01-200911	0	1	9/11/2020	**4**	**6.9**	**9.5**	**107**	**0.33**	**162 J-**	**17.2**	**5.9**	**2.7**	**120**	**658**																	**108000**								
KKR-20-046	KKR-20-046-C-01-03-200911	1	3	9/11/2020	**11**	**20**	**16**	**93.7**	**0.49**	**150 J-**	**15.2**	**8.1**	**3.3**	**45.3**	**280**																									
KKR-20-046	KKR-20-046-C-03-05-200911	3	5	9/11/2020	**7.2**	**5.1**	**6.3**	**175**	**1.1**	**70.9 J-**	**9.4**	**4.5**	**0.64**	**26**	**130**																									
KKR-20-046	KKR-20-046-C-05-07-200911	5	7	9/11/2020	**49**	**20**	**22**	**686**	**1.4**	**144 J-**	**16.9**	**10**	**1.2**	**73.4**	**270**																									
KKR-20-046	KKR-20-046-C-07-8.6-200911	7	8.6	9/11/2020	**44**	**25**	**28**	**265**	**0.97**	**68.9 J-**	**12.1**	**5.1**	**0.56**	**37.1**	**136**																									
KKR-20-047	KKR-20-047-C-00-01-200917	0	1	9/17/2020	**0.61**	**1.8**	**2.9**	**103**	**0.4**	**109 J**	**23.2**	**7.2**	**2.8 J**	**61.3 J**	**301**																									
KKR-20-047	KKR-20-047-C-01-03-200917	1	3	9/17/2020	**1.2**	**3.1**	**6.6**	**137**	**0.45**	**152 J**	**24.4**	**8.3**	**3.9 J**	**71.1 J**	**362**																									
KKR-20-047	KKR-20-047-C-03-3.9-200917	3	3.9	9/17/2020	**1.1**	**2.3**	**4.3**	**214**	**0.53**	**238 J**	**27.4**	**9.6**	**5.7 J**	**94.9 J**	**428**																									
KKR-20-047	KKR-20-047-C-3.9-4.8-200917	3.9	4.8	9/17/2020	0.0098 U	0.014 U	0.012 U	**23.5**	**0.025**	**10.7 J**	**24.9**	**3.3**	**0.2 J**	**15.6 J**	**61.3**																									
KKR-20-048	KKR-20-048-C-00-01-200922	0	1	9/22/2020	**2.3**	**8.5**	**13**	**115**	**0.43 J-**	**138**	**25.4**	**7.4**	**3.4**	**81.5**	**327**																									
KKR-20-048	KKR-20-048-C-01-1.8-200922	1	1.8	9/22/2020	**1.7**	**2.8**	**5.8**	**147**	**0.42 J-**	**153**	**24.6**	**7.6**	**3.9**	**87.4**	**339**																									
KKR-20-048	KKR-20-048-C-1.8-2.3-200922	1.8	2.3	9/22/2020	**0.023 J**	**0.036 J**	**0.061**	**21.8**	**0.024 J-**	**9.5**	**24.7**	**3.5**	**0.13**	**18.5**	**41.2**																									
KKR-20-049	KKR-20-049-C-00-01-200923	0	1	9/23/2020	**3**	**5.1**	**11**	**248**	**5.9**	**182**	**24.8**	**14.7**	**5.6**	**75.9**	**377**																	**72500**	**J-**							
KKR-20-049	KKR-20-049-G-00-01-200923	0	1	9/23/2020																											**16.2**	**30.6**	**7.9**	**8.5**	**14.2**	**23.2**	**30**	**53.2**
KKR-20-049	KKR-20-049-C-01-03-200923	1	3	9/23/2020	**2.3**	**4.9**	**10**	**331**	**1.2**	**157**	**23.9**	**14.2**	**4.3**	**71.8**	**354**																	**79100**	**J-**							
KKR-20-049	KKR-20-049-G-01-03-200923	1	3	9/23/2020																											**1.8**	**27.9**	**2.1**	**5.2**	**20.6**	**40.5**	**29.8**	**70.3**
KKR-20-049	KKR-20-049-C-03-3.8-200923	3	3.8	9/23/2020	**0.56**	**1.7**	**2.6**	**34.6**	**0.2**	**12.4**	**6**	**1.7**	**0.15**	**9.4**	**32.6**																	**78500**	**J-**							
KKR-20-049	KKR-20-049-G-03-3.8-200923	3	3.8	9/23/2020																											**0.7**	**31.6**	**0.4**	**4.6**	**26.6**	**51.2**	**16.5**	**67.7**
KKR-20-050	KKR-20-050-C-00-01-200922	0	1	9/22/2020	**1.7**	**2.7**	**6**	**133**	**0.39 J-**	**125**	**23**	**8.5**	**4.3**	**55**	**277**																									
KKR-20-050	KKR-20-050-C-01-1.7-200922	1	1.7	9/22/2020	**1.3**	**1.8**	**4.8**	**128**	**0.35 J-**	**142**	**21**	**9.2**	**3.9**	**55.4**	**323**																									
KKR-20-051	KKR-20-051-C-00-01-200922	0	1	9/22/2020	**0.96**	**1.5**	**3.8**	**120**	**0.34 J-**	**138**	**24.5**	**6.9**	**3.2**	**72.4**	**313**																									
KKR-20-051	KKR-20-051-C-01-2.3-200922	1	2.3	9/22/2020	**0.73**	**1.4**	**3.3**	**148**	**0.21 J-**	**127**	**35.8**	**7.7**	**3.1**	**77.5**	**222**																									
KKR-20-052	KKR-20-052-C-00-01-200909	0	1	9/9/2020	**0.95**	**1.9**	**3.7**	**101**	**0.4**	**109**	**20.7**	**6.3**	**2.7**	**59.7**	**243**																									
KKR-20-052	KKR-20-052-C-01-03-200909	1	3	9/9/2020	**1.2**	**2.6**	**5.2**	**180**	**0.51**	**221**	**24.9**	**9.2**	**5.3**	**74.4**	**376**																									
KKR-20-052	KKR-20-052-C-03-3.5-200909	3	3.5	9/9/2020	**2.7**	**4.5**	**7.3**	**103**	**0.75**	**71**	**11.1**	**7.2**	**2.3**	**32.5**	**160**																									
KKR-20-053	KKR-20-053-C-00-01-200909	0	1	9/9/2020	**1.5**	**2.9**	**6.3**	**204**	**0.68**	**235**	**28.5**	**10.2**	**6**	**90.5**	**434**																									
KKR-20-053	KKR-20-053-C-01-03-200909	1	3	9/9/2020	**1.2**	**4.6**	**7.9**	**289**	**0.64**	**475**	**37**	**13.5**	**9.3**	**86.3**	**531**																									
KKR-20-053	KKR-20-053-C-03-05-200909	3	5	9/9/2020	**1.7**	**3.5**	**7.1**	**162**	**1.1**	**193**	**24.5**	**14.5**	**5.5**	**64.1**	**341**																									
KKR-20-053	KKR-20-053-C-05-5.4-200909	5	5.4	9/9/2020	0.0081 U	0.011 U	0.0098 U	**11.8**	**0.013 J**	**6.8**	**13**	**2.4**	**0.12**	**11.5**	**39.4**																									
KKR-20-054	KKR-20-054-C-00-01-200924	0	1	9/24/2020	**1.4**	**2**	**6**	**112 J**	**0.48**	**134**	**21.6**	**6.5**	**3.1**	**67.5**	**286 J**																									
KKR-20-054	KKR-20-054-C-01-03-200924	1	3	9/24/2020	**1.8**	**2.8**	**7.3**	**186 J**	**0.5**	**186**	**24.8**	**7.7**	**4.4**	**79.5**	**342 J**																									
KKR-20-054	KKR-20-054-C-03-05-200924	3	5	9/24/2020	**2.2**	**5.2**	**12**	**280 J**	**0.76**	**325**	**35.1**	**12.4**	**8.6**	**90.9**	**499 J**																									
KKR-20-054	KKR-20-054-C-05-7.1-200924	5	7.1	9/24/2020	**2.3**	**7.9**	**17**	**321 J**	**1**	**415**	**40.1**	**14.7**	**10.5**	**115**	**586 J**																									
KKR-20-055	KKR-20-055-C-00-01-200923	0	1	9/23/2020	**0.84**	**2.3**	**4.5**	**217**	**0.41**	**416**	**36**	**15.7**	**5.6**	**103**	**420**																									
KKR-20-055	KKR-20-055-C-01-03-200923	1	3	9/23/2020	**1.2**	**2.6**	**6**	**311**	**0.74**	**351**	**38.9**	**12.4**	**8**	**104**	**525**																									
KKR-20-055	KKR-20-055-C-03-05-200923	3	5	9/23/2020	**1.8**	**3.9**	**8.6**	**352**	**0.85**	**415**	**39.7**	**14.6**	**10.3**	**108**	**608**																									
KKR-20-055	KKR-20-055-C-05-5.6-200923	5	5.6	9/23/2020	**1.3**	**3.8**	**8.1**	**380**	**1**	**476**	**49.1**	**18.3**	**12.2**	**126**	**773**																									
KKR-20-056	KKR-20-056-C-00-0.9-200923	0	0.9	9/23/2020	0.012 U	0.016 U	**0.016 J**	**15.7**	**0.019 J**	**7.6**	**14.7**	**1.7**	**0.26**	**14.1**	**50**																									
KKR-20-057	KKR-20-057-C-00-01-200923	0	1	9/23/2020	0.011 U	0.015 U	0.013 U	**17.5**	**0.019 J**	**7.8**	**17**	**1.8**	**0.26**	**15.4**	**50.7**																									
KKR-20-058	KKR-20-058-C-00-0.8-200922	0	0.8	9/22/2020	**0.37**	**1**	**2.1**	**99.2**	**0.18 J-**	**139**	**17.2**	**4.5**	**1.8**	**94.2**	**191**																									
KKR-20-059	KKR-20-059-C-00-01-200909	0	1	9/9/2020	**0.84**	**3.5**	**6.8**	**106**	**0.37**	**149**	**21.5**	**6.4**	**2.8**	**86.6**	**336**																									
KKR-20-059	KKR-20-059-C-01-03-200909	1	3	9/9/2020	**1.1**	**3**	**4.9**	**148**	**0.45**	**158**	**23.3**	**8**	**3.6**	**80.2**	**338**																									
KKR-20-059	KKR-20-059-C-03-4.1-200909	3	4.1	9/9/2020	**1.7**	**10**	**13**	**437**	**0.73**	**357**	**32.4**	**10.9**	**8.4**	**99.9**	**504**																									
KKR-20-059	KKR-20-059-C-4.1-5.2-200909	4.1	5.2	9/9/2020	0.01 U	0.014 U	**0.015 J**	**16.5**	**0.018 J**	**7.5**	**14.8**	**1.9**	**0.17**	**11**	**42.5**																									
KKR-20-060	KKR-20-060-C-00-01-200904	0	1	9/4/2020	**2.9**	**5.3**	**10**	**333**	**1.6**	**322**	**40.1 J**	**21.6 J**	**11.6 J**	**119 J**	**604**																	**105000**								
KKR-20-060	KKR-20-060-C-01-03-200904	1	3	9/4/2020	**3.7**	**5.7**	**13**	**231**	**1.3**	**202**	**29.1 J**	**26.6 J**	**11.7 J**	**95.1 J**	**548**																	**232000**								
KKR-20-060	KKR-20-060-C-03-05-200904	3	5	9/4/2020	**3.3**	**5.3**	**15**	**262**	**1.7**	**238**	**31.5 J**	**26 J**	**11.4 J**	**102 J**	**589**																	**218000 J**								
KKR-20-060	KKR-20-060-C-05-6.8-200904	5	6.8	9/4/2020	**2.2**	**4.7**	**9.7**	**237**	**1.8**	**182**	**28.1 J**	**18.9 J**	**6.1 J**	**84.2 J**	**402**																	**169000**								
KKR-20-060	KKR-20-060-C-6.8-8.8-200904	6.8	8.8	9/4/2020	0.011 U	0.015 U	0.013 U	**14.4**	**0.024**	**5.7**	**12.6 J**	**1.8 J**	**0.25 J**	**11.1 J**	**43.7**																	**49800**								
KKR-20-061	KKR-20-061-C-00-01-200904	0	1	9/4/2020	**0.59**	**2.6**	**5.5**	**381**	**0.4**	**187**	**25.4 J**	**8.4 J**	**3.9 J**	**74.1 J**	**373**																	**64300**								
KKR-20-061	KKR-20-061-C-01-03-200904	1	3	9/4/2020	**0.92**	**4.6**	**9.8**	**634**	**0.72**	**456**	**36.4 J**	**12.7 J**	**11.6 J**	**109 J**	**606**																	**71600**								
KKR-20-061	KKR-20-061-C-03-05-200904	3	5	9/4/2020	**1.7**	**6.9**	**11**	**382**	**1.2**	**302**	**39.5 J**	**15.6 J**	**10.8 J**	**109 J**	**543**																	**84000**								
KKR-20-061	KKR-20-061-C-05-7.4-200904	5	7.4	9/4/2020	**2.2**	**4.8**	**8.2**	**266**	**1.3**	**266**	**29.2 J-**	**20.9**	**9.7**	**92.5 J-**	**504 J-**																	**225000 J**								
KKR-20-061	KKR-20-061-C-7.4-9.1-200904	7.4	9.1	9/4/2020	0.011 U	0.015 U	0.014 U	**11.9**	**0.024**	**5.6**	**9.4 J-**	**1.7**	**0.24**	**9.6 J-**	**39.7 J-**																	**72600**								
KKR-20-062	KKR-20-062-C-00-0.9-200903	0	0.9	9/3/2020	**0.97**	**4.1**	**7.5**	**484**	**0.6**	**239**	**32.9**	**9.7**	**5.6**	**113**	**482**																	**64600**								
KKR-20-062	KKR-20-062-G-00-01-200903	0	1	9/3/2020																											**2.2**	**19.1**	**0.8**	**4.5**	**13.8**	**27.1**	**51.6**	**78.7**
KKR-20-062	KKR-20-062-C-0.9-03-200903	0.9	3	9/3/2020	0.011 U	0.015 U	0.013 U	**15**	0.017 U	**6.8**	**16.2**	**2**	**0.19**	**13.2**	**45.6**																	**52000**								
KKR-20-062	KKR-20-062-G-01-3.2-200903	1	3.2	9/3/2020																											**0.3**	**12.3**	**0.3**	**3.5**	**8.5**	**37.8**	**49.6**	**87.4**
KKR-20-062	KKR-20-062-G-3.2-5.4-200903	3.2	5.4	9/3/2020																											**1.3**	**11.8**	**0.1**	**3**	**8.7**	**51.3**	**35.6**	**86.9**
KKR-20-063	KKR-20-063-C-00-01-200904	0	1	9/4/2020	**0.45 J**	**1.9**	**3.8**	**116**	**0.38**	**109**	**21.3 J-**	**6.7**	**2.9**	**64.6 J-**	**303 J-**																	**74100**								
KKR-20-063	KKR-20-063-C-01-2.4-200904	1	2.4	9/4/2020	**0.64 J**	**2.6**	**5**	**450**	**0.51**	**178**	**26.4 J**	**7.9 J**	**4.1 J**	**89.1 J**	**377**																	**65400**								
KKR-20-063	KKR-20-063-C-2.4-05-200904	2.4	5	9/4/2020	0.011 U	0.015 U	0.013 U	**16.6**	**0.019 J**	**6.3**	**14.9 J**	**1.6 J**	**0.18 J**	**11.7 J**	**43.9**																	**55400**								
KKR-20-063	KKR-20-063-C-05-5.3-200904	5	5.3	9/4/2020	0.012 U	0.016 U	0.014 U	**18.8**	**0.03**	**7.7**	**13 J**	**1.4 J**	**0.18 J**	**10.1 J**	**43.8**																	**54500**								
KKR-20-064	KKR-20-064-C-00-01-200904	0	1	9/4/2020	**1.7**	**22**	**19**	**755**	**0.35**	**352**	**29.6 J-**	**3.6**	**46.6**	**164 J-**	**332 J-**																	**54600**								

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

					PCB										PAH												
Analyte Group					PCB										PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8												
WI CBSQG PEC					3										68.4												
WI CBSQG PEC					5										114												
TSCA					50																						
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB mg/kg	Aroclor 1260 mg/kg	Aroclor 1254 mg/kg	Aroclor 1268 mg/kg	Aroclor 1221 mg/kg	Aroclor 1232 mg/kg	Aroclor 1248 mg/kg	Aroclor 1016 mg/kg	Aroclor 1262 mg/kg	Aroclor 1242 mg/kg	Total PAH mg/kg	2-Methyl naphthalene mg/kg	Acenaphthene mg/kg	Acenaphthylene mg/kg	Anthracene mg/kg	Benzo(a) anthracene mg/kg	Benzo(a)pyrene mg/kg	Benzo(b)-fluoranthene mg/kg	Benzo(e)pyrene mg/kg	Benzo(g,h,i) perylene mg/kg	Benzo(k) fluoranthene mg/kg	Chrysene mg/kg	Dibenzo(a,h) anthracene mg/kg	Fluoranthene mg/kg	Fluorene mg/kg	Indeno(1,2,3-Cd)Pyrene mg/kg
KKR-20-064	KKR-20-064-C-01-1.7-200904	1	1.7	9/4/2020	**1.4**	**0.42 J-**	0.0033 UJ	0.0015 UJ	0.0038 UJ	0.0026 UJ	**0.99 J**	0.0035 UJ	0.0038 UJ	0.0016 UJ	**208**	**0.46 J**	**3.4**	**0.65**	**6.5**	**16**	**13**	**14**	**7.7**	**9.9**	**6.3**	**16**	**2.5**	**39**	**4**	**8.8**
KKR-20-065	KKR-20-065-C-00-01-200923	0	1	9/23/2020	**0.47**	**0.15**	0.0065 U	0.0029 U	0.0077 U	0.0053 U	**0.32**	0.007 U	0.0076 U	0.0032 U	**21.1**	0.1 U	0.12 U	**0.18 J**	**0.28 J**	**1.3**	**1.7**	**2.4**	**1.4 J**	**1.6**	**1**	**2**	**0.65**	**3**	**0.12 J**	**1.4**
KKR-20-065	KKR-20-065-C-01-03-200923	1	3	9/23/2020	**1**	**0.26**	0.0056 U	0.0025 U	0.0066 U	0.0045 U	**0.75**	0.006 U	0.0065 U	0.0027 U	**22**	0.089 U	**0.14 J**	**0.18 J**	**0.35 J**	**1.5**	**1.7**	**2.4**	**1.5 J**	**1.4**	**0.86**	**2.1**	**0.65**	**3.2**	**0.2 J**	**1.2**
KKR-20-065	KKR-20-065-C-03-05-200923	3	5	9/23/2020	**0.93**	**0.25**	0.005 U	0.0022 U	0.0059 U	0.0041 U	**0.68**	0.0054 U	0.0059 U	0.0024 U	**22.3**	0.082 U	**0.13 J**	**0.24 J**	**0.36**	**1.6**	**1.8**	**2.4**	**1.5 J**	**1.5**	**1**	**2**	**0.66**	**3**	**0.18 J**	**1.3**
KKR-20-065	KKR-20-065-C-05-5.7-200923	5	5.7	9/23/2020	**0.97**	**0.24**	0.0048 U	0.0022 U	0.0057 U	0.0039 U	**0.73**	0.0052 U	0.0056 U	0.0023 U	**25.2**	**0.098 J**	**0.17 J**	**0.27 J**	**0.41**	**1.8**	**1.9**	**2.8**	**1.5 J**	**1.6**	**0.89**	**2.3**	**0.61**	**3.8**	**0.25 J**	**1.4**
KKR-20-066	KKR-20-066-C-00-01-200918	0	1	9/18/2020	**2**	**0.38 J**	0.0019 UJ	0.00087 UJ	0.0023 UJ	0.0016 UJ	**1.6 J**	0.0021 UJ	0.0023 UJ	0.00095 UJ	**90.8**	**0.97**	**1.2**	**0.66**	**2.7**	**7.1**	**6.1**	**6.2**	**4**	**4.6**	**3.1**	**7.2**	**1.1**	**15**	**1.7**	**3.6**
KKR-20-066	KKR-20-066-C-01-03-200918	1	3	9/18/2020	**0.46**	**0.12 J**	0.0017 UJ	0.00075 UJ	0.002 UJ	0.0014 UJ	**0.34 J**	0.0018 UJ	0.002 UJ	0.00081 UJ	**64.9**	**1.3**	**0.94**	**0.79**	**2.3**	**5.1**	**4.5**	**4.7**	**3**	**3.5**	**1.9**	**5.7**	**0.93**	**9.5**	**0.98**	**2.5**
KKR-20-066	KKR-20-066-C-03-4.3-200918	3	4.3	9/18/2020	**0.014**	**0.014 J**	0.0015 UJ	0.00067 UJ	0.0018 UJ	0.0012 UJ	0.0012 UJ	0.0016 UJ	0.0018 UJ	0.00073 UJ	**112**	**3.3**	**2.5**	**2**	**5.5**	**8.7**	**7.7**	**6.8**	**4.6**	**4.5**	**2**	**9**	**1.4**	**14**	**2.6**	**3.3**
KKR-20-067	KKR-20-067-C-00-01-200922	0	1	9/22/2020	**0.15**	**0.038 J-**	0.0023 UJ	0.001 UJ	0.0028 UJ	0.0019 UJ	**0.11 J**	0.0025 UJ	0.0027 UJ	0.0011 UJ	**215**	**1.6**	**12**	**3.2**	**13**	**14**	**11**	**9.1**	**6.5**	**5.8**	**3.4**	**13**	**1.9**	**22**	**8.4**	**4.5**
KKR-20-067	KKR-20-067-C-01-03-200922	1	3	9/22/2020	0.0012 U	0.0018 U	0.0019 UJ	0.00087 UJ	0.0023 UJ	0.0016 UJ	0.0016 UJ	0.0021 UJ	0.0023 UJ	0.00095 UJ	**525**	**7.6**	**33**	**8.3**	**32**	**32**	**26**	**20**	**14**	**13**	**6.5**	**29**	**3.7**	**53**	**22**	**9.8**
KKR-20-067	KKR-20-067-C-03-05-200922	3	5	9/22/2020	**0.017**	**0.017**	0.0018 UJ	0.00079 UJ	0.0021 UJ	0.0014 UJ	0.0014 UJ	0.0019 UJ	0.0021 UJ	0.00086 UJ	**1060**	**89**	**85**	**13**	**61**	**50**	**39**	**28**	**21**	**17**	**9.4**	**41**	**5**	**86**	**47**	**13**
KKR-20-067	KKR-20-067-C-05-6.5-200922	5	6.5	9/22/2020	**0.0044**	**0.0044 J**	0.0017 UJ	0.00075 UJ	0.002 UJ	0.0014 UJ	0.0013 UJ	0.0018 UJ	0.002 UJ	0.00082 UJ	**91.8**	**1.5**	**4.3**	**1.8**	**6.3**	**6.8**	**5.4**	**4.3**	**3.1**	**2.6**	**1.3**	**6.6**	**1.1**	**9**	**3**	**2**
KKR-20-068	KKR-20-068-C-00-1.3-200923	0	1.3	9/23/2020	**0.11**	**0.03 J**	0.0057 U	0.0026 U	0.0067 U	0.0046 U	**0.076**	0.0062 U	0.0067 U	0.0028 U	**4.7**	0.036 U	0.043 U	0.033 U	**0.065 J**	**0.29**	**0.38**	**0.54**	**0.32 J**	**0.36**	**0.19**	**0.46**	0.097 U	**0.71**	0.03 U	**0.28**
KKR-20-068	KKR-20-068-C-1.3-2.1-200923	1.3	2.1	9/23/2020	0.0023 U	0.0036 U	0.0038 U	0.0017 U	0.0045 U	0.0031 U	0.0031 U	0.0042 U	0.0045 U	0.0019 U	**0.19**	0.012 U	0.015 U	0.011 U	0.013 U	0.023 U	0.022 U	0.013 U	0.035 U	0.011 U	0.016 U	0.029 U	0.033 U	**0.022 J**	0.01 U	0.026 U
KKR-20-069	KKR-20-069-C-00-0.3-200922	0	0.3	9/22/2020	**0.42**	**0.1**	0.0032 UJ	0.0014 UJ	0.0038 UJ	0.0026 UJ	**0.32 J**	0.0035 UJ	0.0038 UJ	0.0016 UJ	**24.5**	0.1 U	**0.13 J**	**0.12 J**	**0.32 J**	**1.5**	**1.7**	**2.5**	**1.5 J**	**1.7**	**1.2**	**2.3**	**0.72**	**3.8**	**0.15 J**	**1.5**
KKR-20-069	KKR-20-069-C-0.3-1.2-200922	0.3	1.2	9/22/2020	0.0009 U	0.0015 U	0.0015 UJ	0.00069 UJ	0.0018 UJ	0.0013 UJ	0.0012 UJ	0.0017 UJ	0.0018 UJ	0.00075 UJ	0.014 U	0.0099 U	0.012 U	0.0091 U	0.011 U	0.019 U	0.018 U	0.01 U	0.028 U	0.0089 U	0.012 U	0.023 U	0.026 U	0.011 U	0.0081 U	0.021 U
KKR-21-001	*KKR-21-001-210811*	0	0.3	8/11/2021	0.0019 U	0.003 U	0.0032 U	0.0014 U	0.0038 U	0.0026 U	0.0025 U	0.0034 U	0.0037 U	0.0016 U	**0.17**	0.01 U	0.012 U	0.0093 U	0.011 U	0.019 U	0.018 U	0.01 U	0.085 U	0.0092 U	0.013 UJ	0.024 UJ	0.027 U	**0.013 J**	0.0084 U	0.021 U
KKR-21-002	*KKR-21-002-210813*	0	0.1	8/13/2021	0.002 U	0.0031 U	0.0033 U	0.0015 U	0.0039 U	0.0027 U	0.0027 U	0.0036 U	0.0039 U	0.0016 U	**22.5**	0.32 U	0.38 U	0.29 U	**0.61 J**	**1.7**	**1.6**	**2**	2.7 U	**1.5**	**0.55 J**	**1.9**	0.85 U	**3.7**	0.26 U	**1.1 J**
KKR-21-003	*KKR-21-003-210811*	0	0.3	8/11/2021	0.0021 U	0.0033 U	0.0035 U	0.0016 U	0.0041 U	0.0028 U	0.0028 U	0.0038 U	0.0041 U	0.0017 U	**32.3**	0.33 U	0.4 U	0.3 U	**0.62 J**	**2.5**	**2.2**	**3.5**	2.8 U	**1.9**	**1.1 J**	**2.8**	0.88 U	**5.7**	0.27 U	**1.6**
KKR-21-003	*KKR-21-003-G-210811*	0	0.3	8/11/2021																										
KKR-21-004	*KKR-21-004-00-0.6-210811*	0	0.6	8/12/2021	0.0019 U	0.003 U	0.0031 U	0.0014 U	0.0037 U	0.0025 U	0.0025 U	0.0034 U	0.0037 U	0.0015 U	**4.4**	0.0099 U	**0.019 J**	**0.021 J**	**0.055**	**0.31**	**0.31**	**0.46**	**0.26**	**0.26**	**0.18**	**0.4**	**0.063**	**0.78**	**0.023 J**	**0.23**
KKR-21-004	*KKR-21-004-0.6-1.3-210811*	0.6	1.3	8/12/2021	0.0019 U	0.0031 U	0.0032 U	0.0015 U	0.0038 U	0.0026 U	0.0026 U	0.0035 U	0.0038 U	0.0016 U	**4.6**	0.01 U	**0.018 J**	**0.014 J**	**0.074**	**0.34**	**0.34**	**0.51**	**0.28**	**0.3**	**0.16**	**0.42**	**0.072**	**0.81**	**0.022 J**	**0.27**
KKR-21-005	*KKR-21-005-00-0.5-210812*	0	0.5	8/12/2021	0.0019 U	0.003 U	0.0031 U	0.0014 U	0.0037 U	0.0025 U	0.0025 U	0.0034 U	0.0037 U	0.0015 U	0.041 U	0.0097 U	0.012 U	0.0089 U	0.011 U	0.018 U	0.018 U	0.01 U	0.081 U	0.0088 U	0.012 U	0.023 U	0.026 U	0.011 U	0.008 U	0.02 U
KKR-21-006	*KKR-21-006-00-0.4-210812*	0	0.4	8/12/2021	0.0018 U	0.0029 U	0.003 U	0.0014 U	0.0036 U	0.0025 U	0.0024 U	0.0033 U	0.0036 U	0.0015 U	**0.23**	0.0096 U	0.012 U	0.0088 U	0.01 U	0.018 U	0.017 U	**0.02 J**	0.08 U	**0.015 J**	0.012 U	0.022 U	0.026 U	**0.03 J**	0.0079 U	0.02 U
KKR-21-007	*KKR-21-007-210811*	0	0.3	8/11/2021	**0.019**	**0.019**	0.0032 U	0.0015 U	0.0038 U	0.0026 U	0.0026 U	0.0035 U	0.0038 U	0.0016 U	**7.7**	0.021 U	**0.044 J**	**0.02 J**	**0.3**	**0.62**	**0.5**	**0.71**	**0.37 J**	**0.43**	**0.2**	**0.66**	**0.099**	**1.3 J**	**0.08 J**	**0.36**
KKR-21-007	*KKR-21-007-G-210811*	0	0.3	8/11/2021																										
KKR-21-008	*KKR-21-008-210811*	0	0.3	8/11/2021	**0.14**	**0.031**	0.0029 U	0.0013 U	0.0035 U	0.0024 U	**0.11**	0.0032 U	0.0035 U	0.0014 U	**140**	**0.13 J**	**1**	**0.88**	**6.6**	**11**	**8.8**	**10**	**5.8**	**6.9**	**5.1**	**12**	**1.8**	**23**	**2.2**	**6.1**
KKR-21-009	*KKR-21-009-210811*	0	0.3	8/11/2021	**0.016**	0.0029 U	**0.016**	0.0014 U	0.0036 U	0.0025 U	0.0024 U	0.0033 U	0.0036 U	0.0015 U	**4.2**	0.019 U	0.023 U	**0.019 J**	**0.081**	**0.36**	**0.34**	**0.41**	**0.25 J**	**0.31**	**0.2**	**0.37**	**0.08**	**0.63**	**0.025 J**	**0.25**
KKR-21-010	*KKR-21-010-00-0.1-210812*	0	0.1	8/12/2021	0.002 U	0.0031 U	0.0033 U	0.0015 U	0.0039 U	0.0027 U	0.0026 U	0.0036 U	0.0039 U	0.0016 U	**0.46**	0.011 U	0.013 U	0.0096 U	0.011 U	**0.034 J**	**0.025 J**	**0.031 J**	0.088 U	**0.015 J**	**0.018 J**	**0.041 J**	0.028 U	**0.085**	0.0086 U	0.022 U
KKR-21-011	*KKR-21-011-00-0.2-210812*	0	0.2	8/12/2021	0.0023 U	0.0037 U	0.0039 U	0.0018 U	0.0046 U	0.0032 U	0.0031 U	0.0043 U	0.0046 U	0.0019 U	**68.7**	0.19 U	**0.39 J**	0.17 U	**1.1**	**4.9**	**4.3**	**6.9**	**3.7 J**	**4.7**	**2.3**	**5.8**	**1**	**12**	**0.44 J**	**4.2**
KKR-21-012	*KKR-21-012-00-0.2-210812*	0	0.2	8/12/2021	0.0019 U	0.0031 U	0.0032 U	0.0015 U	0.0038 U	0.0026 U	0.0026 U	0.0035 U	0.0038 U	0.0016 U	**4.1**	0.052 U	0.062 U	0.047 U	**0.062 J**	**0.29**	**0.32**	**0.45**	0.43 U	**0.28**	**0.14 J**	**0.4**	0.14 U	**0.62**	0.042 U	**0.26**
KKR-21-012	*KKR-21-012-G-210812*	0	0.2	8/12/2021																										
KKR-21-013	*KKR-21-013-00-0.1-210813*	0	0.1	8/13/2021	**0.019**	0.0029 U	**0.019**	0.0014 U	0.0036 U	0.0025 U	0.0024 U	0.0033 U	0.0035 U	0.0015 U	**9.9**	0.097 U	0.12 U	0.089 U	**0.23 J**	**0.83**	**0.7**	**0.95**	0.81 U	**0.6**	**0.39 J**	**0.91**	0.26 U	**1.5**	0.08 U	**0.6**
KKR-21-014	*KKR-21-014-00-0.25-210812*	0	0.2	8/12/2021	**0.011**	0.0031 U	**0.011**	0.0015 U	0.0039 U	0.0027 U	0.0027 U	0.0036 U	0.0039 U	0.0016 U	**55.5**	0.16 U	**0.5 J**	0.14 U	**1.4**	**3.9**	**3.4**	**5**	**2.6 J**	**3**	**1.9**	**4.4**	**0.69**	**11**	**0.53 J**	**2.7**
KKR-21-015	*KKR-21-015-00-0.25-210812*	0	0.2	8/12/2021	**0.0063**	0.0028 U	**0.0063 J**	0.0013 U	0.0034 U	0.0024 U	0.0023 U	0.0032 U	0.0034 U	0.0014 U	**9.6**	0.093 U	0.11 U	0.085 U	**0.17 J**	**0.7**	**0.65**	**0.94**	0.78 U	**0.6**	**0.38 J**	**0.88**	0.25 U	**1.7**	**0.078 J**	**0.53**
KKR-21-016	*KKR-21-016-00-0.2-210812*	0	0.2	8/12/2021	**0.0097**	0.0037 U	**0.0097 J**	0.0018 U	0.0046 U	0.0032 U	0.0031 U	0.0043 U	0.0046 U	0.0019 U	**30**	0.12 U	**0.16 J**	0.11 U	**0.38 J**	**2 J**	**2.1 J**	**3 J**	**1.7 J**	**2 J**	**1.2 J**	**2.5 J**	**0.46 J**	**5.2 J**	**0.21 J**	**1.8 J**
KKR-21-017	*KKR-21-017-00-0.1-210813*	0	0.1	8/13/2021	**0.07**	0.0057 U	**0.07**	0.0027 U	0.0071 U	0.0049 U	0.0048 U	0.0065 U	0.007 U	0.0029 U	**37.5**	0.097 U	**0.14 J**	**0.12 J**	**0.42**	**2.5**	**2.7**	**4.6**	**2.4**	**2.9**	**1.3**	**3.8**	**0.71**	**5.5**	**0.14 J**	**2.4**
KKR-21-018	*KKR-21-018-00-0.3-210812*	0	0.3	8/12/2021	**0.0061**	0.0029 U	**0.0061 J**	0.0014 U	0.0037 U	0.0025 U	0.0025 U	0.0034 U	0.0036 U	0.0015 U	**7.9**	0.049 U	0.059 U	**0.047 J**	**0.13 J**	**0.61**	**0.56**	**0.78**	**0.44 J**	**0.54**	**0.3**	**0.69**	0.13 U	**1.4**	**0.046 J**	**0.53**
KKR-21-019	*KKR-21-019-210813*	0	0.1	8/13/2021	**1.3**	**0.39**	0.0033 U	0.0015 U	0.0039 U	0.0027 U	**0.95**	0.0036 U	0.0039 U	0.0016 U	**43.2**	0.11 U	**0.19 J**	**0.15 J**	**0.71**	**3.7**	**3.4**	**4.1**	**2.4**	**2.9**	**1.9**	**4**	**0.77**	**6.5**	**0.26 J**	**2.6**
KKR-21-020	*KKR-21-020-210813*	0	0.1	8/13/2021	**0.87**	**0.64**	0.0042 U	0.0019 U	0.005 U	0.0034 U	**0.23**	0.0046 U	0.005 U	0.0021 U	**26.8**	0.067 U	**0.12 J**	0.062 U	**0.37**	**2.1**	**2**	**2.9**	**1.6**	**1.9**	**1**	**2.6**	**0.49**	**4.2**	**0.14 J**	**1.6**
KKR-21-020	*KKR-21-020-G-210813*	0	0.1	8/13/2021																										
KKR-21-021	KKR-21-021-210813	0	0.1	8/13/2021	**0.13**	**0.065**	0.0036 U	0.0016 U	0.0043 U	0.003 U	**0.065**	0.004 U	0.0043 U	0.0018 U	**24.7**	0.29 U	0.35 U	0.27 U	**0.42 J**	**1.8**	**1.7**	**2.5**	2.4 U	**1.6**	**0.92 J**	**2.4**	0.78 U	**4**	0.24 U	**1.5**
KKR-21-024	KKR-21-024-00-0.5-210806	0	0.5	8/6/2021	0.0024 U	0.0038 U	0.004 U	0.0018 U	0.0047 U	0.0033 U	0.0032 U	0.0044 U	0.0047 U	0.002 U	**11.4**	**0.095 J**	**0.043 J**	**0.095 J**	**0.19**	**0.8**	**0.83**	**1.2**	**0.68**	**0.77**	**0.48**	**0.94**	**0.19**	**1.9**	**0.05 J**	**0.73**
KKR-21-024	KKR-21-024-0.5-1.25-210806	0.5	1.2	8/6/2021	0.0019 U	0.0031 U	0.0032 U	0.0014 U	0.0038 U	0.0026 U	0.0026 U	0.0035 U	0.0038 U	0.0016 U	**2.8**	**0.02 J**	**0.016 J**	**0.025 J**	**0.04 J**	**0.2**	**0.21**	**0.32**	**0.18 J**	**0.19**	**0.1**	**0.22**	**0.05**	**0.43**	**0.018 J**	**0.18**
KKR-21-025	KKR-21-025-00-01-210806	0	1	8/6/2021	**0.056**	**0.025**	0.0043 U	0.0019 U	0.0051 U	0.0035 U	**0.031**	0.0047 U	0.0051 U	0.0021 U	**77.4**	0.28 U	**0.49 J**	**0.45 J**	**1.5**	**6**	**5.7**	**8.4**	**4.5 J**	**4.9**	**2.5**	**6**	**1.3**	**13**	**0.54 J**	**4.6**
KKR-21-026	KKR-21-026-0.2-01-210806	0.2	1	8/6/2021	**3.9**	**0.31**	0.0034 U	0.0015 U	0.004 U	0.0027 U	**3.6**	0.0037 U	0.004 U	0.0016 U	**300**	**0.74 J**	**3.8**	**1.4**	**10**	**21**	**16**	**23**	**13**	**12**	**8.4**	**23**	**3.6**	**55**	**6.6**	**12**
KKR-21-026	KKR-21-026-01-1.7-210806	1	1.7	8/6/2021	**3.7**	**0.23**	0.0035 U	0.0016 U	0.0042 U	0.0029 U	**3.5**	0.0038 U	0.0041 U	0.0017 U	**483**	**1 J**	**5.9**	**2.1**	**18**	**34**	**27**	**37**	**20**	**19**	**14**	**35**	**5.7**	**93**	**9.9**	**19**
KKR-21-028	KKR-21-028-00-0.8-210806	0	0.8	8/6/2021	**0.047**	**0.013**	0.0034 U	0.0015 U	0.004 U	0.0028 U	**0.034**	0.0037 U	0.004 U	0.0017 U	**60.7**	0.17 U	**0.29 J**	**0.21 J**	**0.86**	**4.4**	**4.5**	**6.9**	**3.4**	**4**	**1.9**	**4.7**	**1**	**11**	**0.27 J**	**3.8**
KKR-21-029	KKR-21-029-210810	0	0.3	8/10/2021	**0.22**	**0.057**	0.0077 U	0.0034 U	0.009 U	0.0062 U	**0.16**	0.0083 U	0.009 U	0.0037 U	**63.8**	0.25 U	0.29 U	0.22 U	**0.66 J**	**4**	**4.6**	**8.5**	**4.7 J**	**4.4**	**2.5**	**6.4**	0.65 U	**9.6**	**0.37 J**	**4.1**
KKR-21-031	KKR-21-031-210810	0	0.3	8/10/2021	**0.27**	**0.023**	0.0031 U	0.0014 U	0.0037 U	0.0025 U	**0.25**	0.0034 U	0.0036 U	0.0015 U	**22.2**	0.049 U	**0.24**	**0.11 J**	**0.54**	**1.8**	**1.5**	**2.2**	**1.1**	**1**	**0.75**	**2**	**0.28**	**4**	**0.27**	**0.86**
KKR-21-032	KKR-21-032-00-0.7-210810	0	0.7	8/10/2021	**0.29**	**0.14**	0.0038 U	0.0017 U	0.0045 U	0.0031 U	**0.15**	0.0041 U	0.0045 U	0.0019 U	**57.7**	**0.083 J**	**0.31**	**0.2 J**	**0.85**	**4.1**	**4.9**	**6.4**	**3.6**	**4.2**	**2.4**	**5**	**1**	**8.6**	**0.38**	**3.7**
KKR-21-032	KKR-21-032-0.7-02-210810	0.7	2	8/10/2021	**0.22**	**0.042**	0.006 U	0.0027 U	0.0071 U	0.0049 U	**0.18**	0.0065 U	0.007 U	0.0029 U	**59.7**	0.096 U	**0.19 J**	**0.23 J**	**0.61**	**3.7**	**4.5**	**7.8**	**4.1**	**4.2**	**2.8**	**5.9**	**0.91**	**9**	**0.28 J**	**3.8**
KKR-21-032	KKR-21-032-G-0.7-02-210810	0.7	2	8/10/2021																										
KKR-21-033	KKR-21-033-00-0.4-210810	0	0.4	8/10/2021	**0.38**	**0.068**	0.0061 U	0.0027 U	0.0072 U	0.005 U	**0.31**	0.0066 U	0.0072 U	0.003 U	**99.1**	0.19 U	**0.42 J**	**0.36 J**	**1.3**	**6.9**	**7.7**	**11**	**6.1**	**6.4**	**4.3**	**9.4**	**1.4**	**16**	**0.71 J**	**5.7**
KKR-21-033	KKR-21-033-0.4-1.2-210810	0.4	1.2	8/10/2021	**7.5**	**0.89 J**	0.035 U	0.016 U	0.042 U	0.029 U	**6.6 J**	0.038 U	0.041 U	0.017 U	**181**	**0.19 J**	**1.3**	**0.51**	**3**	**15**	**15**	**19**	**10**	**11**	**7.6**	**17**	**2.3**	**29**	**1.7**	**11**
KKR-21-034	KKR-21-034-00-1.0-210808	0	1	8/8/2021	**0.1**	**0.055**	0.0042 U	0.0019 U	0.0049 U	0.0034 U	**0.045**	0.0045 U	0.0049 U	0.002 U	**76.7**	0.2 U	**0.5 J**	**0.44 J**	**1.3**	**5.4**	**5.6**	**8.3**	**4.2**	**5.3**	**2.5**	**5.9**	**1.3**	**13**	**0.47 J**	**5.1**
KKR-21-034	KKR-21-034-01-1.2-210808	1	1.2	8/8/2021	**0.1**	**0.036**	0.0033 U	0.0015 U	0.0038 U	0.0026 U	**0.064**	0.0035 U	0.0038 U	0.0016 U	**28.6**	0.052 U	**0.16 J**	**0.18 J**	**0.49**	**2**	**2.2**	**3.2**	**1.6**	**2.1**	**0.89**	**2.2**	**0.51**	**4.8**	**0.17 J**	**1.9**
KKR-21-035	KKR-21-035-00-01-210806	0	1	8/6/2021	**2.5**	**0.18**	0.0041 U	0.0018 U	0.0048 U	0.0033 U	0.0033 U	0.0044 U	0.0048 U	**2.3**	**299**	**0.78 J**	**4.5**	**0.65 J**	**7.3**	**19**	**19**	**28**	**15**	**14**	**9.4**	**23**	**4.1**	**55**	**5.8**	**14**
KKR-21-035	KKR-21-035-01-03-210806	1	3	8/6/2021	**1.6**	**0.16**	0.0036 U	0.0016 U	0.0043 U	0.0029 U	**1.4**	0.0039 U	0.0043 U	0.0018 U	**243**	**0.49 J**	**3.3**	**0.76 J**	**6.1**	**17**	**14**	**22**	**11**	**12**	**7.5**	**19**	**3.7**	**42**	**4.4**	**12**
KKR-21-035	KKR-21-035-03-5.5-210806	3	5.5	8/6/2021	**0.41**	**0.03**	0.0039 U	0.0017 U	0.0046 U	0.0032 U	**0.38**	0.0042 U	0.0046 U	0.0019 U	**298**	**0.76 J**	**2.2**	**1.5**	**8**	**18**	**17**	**26**	**15**	**14**	**9.6**	**25**	**4.1**	**56**	**4.6**	**14**
KKR-21-035	KKR-21-035-5.5-7.8-210806	5.5	7.8	8/6/2021	**0.32**	0.0039 U	**0.32**	0.0018 U	0.0048 U	0.0033 U	0.0033 U	0.0044 U	0.0048 U	0.002 U	**182**	**0.6 J**	**1.3**	**1 J**	**4.7**	**11**	**10**	**17**	**9.2**	**9.4**	**4.8**	**15**	**2.5**	**35**	**2.5**	**8.7**
KKR-21-036	KKR-21-036-00-0.8-210810	0	0.8	8/10/2021	**0.39**	**0.11**	0.0053 U	0.0024 U	0.0062 U	0.0043 U	**0.28**	0.0057 U	0.0062 U	0.0026 U	**41.5**	0.085 U	**0.15 J**	**0.19 J**	**0.51**	**2.7**	**3.1**	**5**	**2.5**	**3.4**	**1.4**	**3.5**	**0.83**	**6.5**	**0.23 J**	**3.1**
KKR-21-036	KKR-21-036-0.8-1.2-210810	0.8	1.2	8/10/2021	**0.19**	**0.062**	0.0043 U	0.0019 U	0.0051 U	0.0035 U	**0.13 J**	0.0046 U	0.005 U	0.0021 U	**62**	0.14 U	**0.35 J**	**0.21 J**	**0.83**	**4.5**	**5**	**7.4**	**3.9**	**4.2**	**2.3**	**5.7**	**0.95**	**9.6**	**0.4 J**	**3.9**
KKR-21-037	KKR-21-037-00-01-210806	0	1	8/6/2021	**3.5**	**0.36**	0.004 U	0.0018 U	0.0048 U	0.0033 U	**3.1 J**	0.0044 U	0.0047 U	0.002 U	**322**	**0.96 J**	**4.2**	**2**	**11**	**21**	**18**	**28**	**15**	**15**	**8.8**	**25**	**4.5**	**59**	**7**	**14**
KKR-21-037	KKR-21-037-01-03-210806	1	3	8/6/2021	**4.4**	**0.51**	0.0039 U	0.0017 U	0.0046 U	0.0032 U	**3.9**	0.0042 U	0.0046 U	0.0019 U	**205**	**1.2**	**1.7**	**1.6**	**5.9**	**13**	**11**	**19**	**10**	**10**	**5.2**	**17**	**3.1**	**41**	**3.4**	**10**
KKR-21-037	KKR-21-037-03-05-210806	3	5	8/6/2021	**0.94**	0.0039 U	0.0041 U	0.0019 U	0.0049 U	0.0034 U	**0.94 J-**	0.0045 U	0.0049 U	0.002 U	**218**	**1.2**	**2.2**	**1.1**	**6.2**	**14**	**12**	**20**	**11**	**10**	**7.3**	**20**	**3**	**40**	**3.6**	**8.7**
KKR-21-037	KKR-21-037-05-6.5-210806	5	6.5	8/6/2021	**0.097**	0.0036 U	**0.097**	0.0017 U	0.0045 U	0.0031 U	0.003 U	0.0041 U	0.0044 U	0.0019 U	**209**	**0.65 J**	**1.5**	**0.99 J**	**5.5**	**14**	**13**	**19**	**11**	**10**	**7.1**	**18**	**2.8**	**37**	**3.3**	**9.4**
KKR-21-038	KKR-21-038-00-01-210807	0	1	8/7/2021	**1.2**	**0.11**	0.0039 U	0.0018 U	0.0046 U	0.0032 U	**1.1**	0.0043 U	0.0046 U	0.0019 U	**267**	**1**	**2.7**	**1.5**	**7.6**	**19**	**16**	**24**	**13**	**11**	**9.1**	**24**	**3.1**	**48**	**5.1**	**11**
KKR-21-038	KKR-21-038-01-03-210807	1	3	8/7/2021	**1**	**0.087 J**	0.0028 U	0.0013 U	0.0033 U	0.0023 U	**0.91 J**	0.003 U	0.0033 U	0.0014 U	**53.8**	0.14 UJ	**0.45 J**	**0.3 J**	**1.6 J**	**4.4 J**	**3.4 J**	**4.9 J**	**2.5 J**	**2.2 J**	**1.9 J**	**4.6 J**	**0.93 J**	**9.3 J**	**0.77 J**	**2.3 J**
KKR-21-038	KKR-21-038-03-4.9-210807	3	4.9	8/7/2021	**6.7**	**0.65**	0.041 U	0.018 U	0.049 U

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																		Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																								
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
KKR-20-064	KKR-20-064-C-01-1.7-200904	1	1.7	9/4/2020	**1.1**	**30**	**29**	**548**	**0.4**	**344**	**46.6** J-	**4.1**	**12**	**454** J-	**366** J-																	**34800**									
KKR-20-065	KKR-20-065-C-00-01-200923	0	1	9/23/2020	**0.14** J	**1.1**	**2.7**	**61.5**	**0.21**	**70.1**	**17.3**	**4.4**	**1.5**	**49.9**	**203**																										
KKR-20-065	KKR-20-065-C-01-03-200923	1	3	9/23/2020	**0.15** J	**1.3**	**3.1**	**281**	**0.27**	**143**	**22.5**	**5.7**	**2.9**	**77.2**	**277**																										
KKR-20-065	KKR-20-065-C-03-05-200923	3	5	9/23/2020	**0.19** J	**1.3**	**3.1**	**116**	**0.26**	**117**	**23.1**	**5.8**	**2.4**	**74.9**	**271**																										
KKR-20-065	KKR-20-065-C-05-5.7-200923	5	5.7	9/23/2020	**0.22** J	**1.6**	**3.6**	**283**	**0.38** J-	**157**	**22.6**	**6**	**3.3**	**81.6**	**304**																										
KKR-20-066	KKR-20-066-C-00-01-200918	0	1	9/18/2020	**1.6**	**12**	**12**	**100** J	**0.44**	**140** J	**16**	**6.2**	**2.3**	**46** J	**180**																										
KKR-20-066	KKR-20-066-C-01-03-200918	1	3	9/18/2020	**1.3**	**7.1**	**8.9**	**150** J	**0.73**	**140** J	**24**	**9.3**	**4.8**	**57** J	**230**																										
KKR-20-066	KKR-20-066-C-03-4.3-200918	3	4.3	9/18/2020	**2.7**	**15**	**16**	**92** J	**0.59**	**100** J	**16**	**8.9**	**3**	**46** J	**160**																										
KKR-20-067	KKR-20-067-C-00-01-200922	0	1	9/22/2020	**2.5**	**43**	**40**	**193**	**0.77** J-	**183**	**24.8**	**12.1**	**7.5**	**76**	**293**																										
KKR-20-067	KKR-20-067-C-01-03-200922	1	3	9/22/2020	**11**	**110**	**94**	**181**	**0.78** J-	**192**	**27.1**	**13.1**	**8.6**	**79.3**	**274**																										
KKR-20-067	KKR-20-067-C-03-05-200922	3	5	9/22/2020	**81**	**230**	**140**	**153**	**0.86** J-	**273**	**22.4**	**14.3**	**5**	**75.5**	**318**																										
KKR-20-067	KKR-20-067-C-05-6.5-200922	5	6.5	9/22/2020	**1.7**	**16**	**15**	**127**	**0.76** J-	**205**	**17**	**9.8**	**5.9**	**50.3**	**264**																										
KKR-20-068	KKR-20-068-C-00-1.3-200923	0	1.3	9/23/2020	0.029 U	**0.3**	**0.68**	**29.9**	**0.061** J-	**23.2**	**22.2**	**3.1**	**0.47**	**27.6**	**99.4**																										
KKR-20-068	KKR-20-068-C-1.3-2.1-200923	1.3	2.1	9/23/2020	0.01 U	0.014 U	**0.023** J	**19.3**	**0.022** J-	**9**	**20.4**	**2.1**	**0.26**	**16.4**	**54.5**																										
KKR-20-069	KKR-20-069-C-00-0.3-200922	0	0.3	9/22/2020	**0.099** J	**1.6**	**3.6**	**40.6**	**0.12** J-	**52.5**	**16**	**4**	**1**	**38.5**	**166**																										
KKR-20-069	KKR-20-069-C-0.3-1.2-200922	0.3	1.2	9/22/2020	0.0081 U	0.011 U	0.0098 U	**13.5**	**0.014** J-	**6.8**	**15.4**	**1.8**	**0.12**	**11.7**	**32.3**																										
KKR-21-001	*KKR-21-001-210811*	0	0.3	8/11/2021	0.0083 U	0.011 U	**0.011** J	**16.4** J	0.013 U	**10.1**	**21.8**	**4.7**	**0.094**	**18.6**	**41.5**																										
KKR-21-002	*KKR-21-002-210813*	0	0.1	8/13/2021	0.26 U	**2.3**	**3**	**10**	0.014 U	**20.9**	**7.4**	**2**	**0.16**	**13**	**54.6**																										
KKR-21-003	*KKR-21-003-210811*	0	0.3	8/11/2021	0.27 U	**3.3**	**4.5**	**13.8** J	0.014 U	**18** J	**11.7**	**3.7**	**0.16**	**19**	**83.3** J																										
KKR-21-003	*KKR-21-003-G-210811*	0	0.3	8/11/2021																												**39700**		**3.7**		**85**		**5**		**42.5**		**37.5**	**7.8**	**3.5**	**11.3**
KKR-21-004	*KKR-21-004-00-0.6-210811*	0	0.6	8/12/2021	0.0081 U	**0.39**	**0.61**	**10.5** J	0.012 U	**36.9** J	**10.4**	**3**	**0.33**	**12**	**89.3**																										
KKR-21-004	*KKR-21-004-0.6-1.3-210811*	0.6	1.3	8/12/2021	0.0083 U	**0.34**	**0.64**	**14.6** J	0.013 U	**35.3** J	**12.7**	**3.3**	**0.25**	**15.9**	**69.2** J																										
KKR-21-005	*KKR-21-005-00-0.5-210812*	0	0.5	8/12/2021	0.0079 U	0.011 U	0.0096 U	**17.9** J	0.012 U	**10.2** J	**24.2**	**3.7**	**0.094**	**20.2**	**41.5** J																										
KKR-21-006	*KKR-21-006-00-0.4-210812*	0	0.4	8/12/2021	0.0078 U	**0.013** J	**0.024** J	**15.5** J	0.013 U	**10.6**	**18.8**	**4.3**	**0.12**	**16.7**	**42.2** J																										
KKR-21-007	*KKR-21-007-210811*	0	0.3	8/11/2021	0.017 U	**0.87**	**1.1** J	**8.9** J	0.014 U	**13.9** J	**10**	**3.5**	**0.11**	**10.6**	**33.4** J																										
KKR-21-007	*KKR-21-007-G-210811*	0	0.3	8/11/2021																												**35700** J+		**29.8**		**51.1**		**20**		**17.6**		**13.5**	**15.3**	**3.8**	**19.1**
KKR-21-008	*KKR-21-008-210811*	0	0.3	8/11/2021	**0.19** J	**18**	**20**	**20.6** J	**0.015** J	**45.1** J	**11.7**	**2.5**	**0.34**	**25.5**	**148** J																										
KKR-21-009	*KKR-21-009-210811*	0	0.3	8/11/2021	0.016 U	**0.29**	**0.57**	**8.7** J	0.013 U	**15.2** J	**7.9**	**1.8**	**0.15**	**15**	**56.2** J																										
KKR-21-010	*KKR-21-010-00-0.1-210812*	0	0.1	8/12/2021	0.0085 U	**0.049**	**0.067**	**5** J	0.014 U	**8.2**	**7.7**	**2.9**	**0.29**	**11.2**	**80.3**																										
KKR-21-011	*KKR-21-011-00-0.2-210812*	0	0.2	8/12/2021	0.15 U	**0.3**	**0.55**	**12.9** J	0.013 U	**12.4** J	**5.8**	**1.3**	**0.14**	**7.8**	**52.7** J																										
KKR-21-012	*KKR-21-012-00-0.2-210812*	0	0.2	8/12/2021	0.042 U	**0.3**	**0.55**	**12.9** J	0.013 U	**12.4** J	**5.8**	**1.3**	**0.14**	**7.8**	**52.7** J																										
KKR-21-012	*KKR-21-012-G-210812*	0	0.2	8/12/2021																												**32400** J+									
KKR-21-013	*KKR-21-013-00-0.1-210813*	0	0.1	8/13/2021	0.079 U	**0.89**	**1.5**	**13.9**	0.012 U	**14.5**	**13.7**	**3.4**	**0.17**	**13.1**	**86.1**																										
KKR-21-014	*KKR-21-014-00-0.25-210812*	0	0.2	8/12/2021	0.13 U	**6.6**	**7.7**	**16** J	0.014 U	**77.1** J	**7.6**	**2.3**	**0.86**	**24.3**	**225** J																										
KKR-21-015	*KKR-21-015-00-0.25-210812*	0	0.2	8/12/2021	0.076 U	**0.98**	**1.3**	**7.5** J	0.012 U	**12** J	**6.1**	**1.7**	**0.12**	**11.8**	**63.9** J																										
KKR-21-016	*KKR-21-016-00-0.2-210812*	0	0.2	8/12/2021	0.1 U	**2.9** J	**4.2** J	**33.1** J	0.016 U	**97.8** J	**7.3**	**1.8**	**0.21**	**14.4**	**94.9** J																										
KKR-21-017	*KKR-21-017-00-0.1-210813*	0	0.1	8/13/2021	0.079 U	**2.4**	**5.4**	**35**	**0.032** J	**59**	**16**	**3.4**	**0.42**	**44.7**	**294**																										
KKR-21-018	*KKR-21-018-00-0.3-210812*	0	0.3	8/12/2021	0.04 U	**0.49**	**1.2**	**23.7** J	0.013 U	**12.9** J	**10.7**	**2.2**	**0.54**	**21.3**	**186** J																										
KKR-21-019	*KKR-21-019-210813*	0	0.1	8/13/2021	0.087 U	**3.1**	**6.4**	**33.2**	**0.85**	**146**	**16.7**	**3.5**	**1.3**	**50**	**320**																										
KKR-21-020	*KKR-21-020-210813*	0	0.1	8/13/2021	0.055 U	**1.8**	**3.9**	**40**	**0.26**	**158**	**17.1**	**4.8**	**2.9**	**50.7**	**341**																										
KKR-21-020	*KKR-21-020-G-210813*	0	0.1	8/13/2021																												**48000**		**75.8**		**18.5**		**3.7**		**4.8**		**10**	**1.9**	**3.8**	**5.7**
KKR-21-021	KKR-21-021-210813	0	0.1	8/13/2021	0.24 U	**2.1**	**3.5**	**37.1**	**0.063**	**50.8**	**22.7**	**2.5**	**0.43**	**33.4**	**155**																										
KKR-21-024	KKR-21-024-00-0.5-210806	0	0.5	8/6/2021	**0.073** J	**0.76**	**1.6**	**31.9**	**0.11**	**181**	**19.2**	**5.7**	**1.6**	**49.1**	**247**																										
KKR-21-024	KKR-21-024-0.5-1.25-210806	0.5	1.2	8/6/2021	**0.02** J	**0.19**	**0.38**	**18.2**	**0.052**	**66.3**	**15.1**	**3.9**	**0.77**	**21**	**116**																										
KKR-21-025	KKR-21-025-00-01-210806	0	1	8/6/2021	0.22 U	**6.3**	**11**	**61.9**	**0.28**	**1150**	**27.6**	**5.8**	**2.8**	**251**	**506**																										
KKR-21-026	KKR-21-026-0.2-01-210806	0.2	1	8/6/2021	**0.53** J	**43**	**47**	**92.9**	**0.31**	**419**	**26.2**	**7.9**	**9.8**	**91**	**574**																										
KKR-21-026	KKR-21-026-01-1.7-210806	1	1.7	8/6/2021	**1.6**	**70**	**71**	**116**	**0.28**	**564**	**28.1**	**8**	**10.8**	**95.5**	**703**																										
KKR-21-028	KKR-21-028-00-0.8-210806	0	0.8	8/6/2021	0.13 U	**4.5**	**8.8**	**30.7**	**0.11**	**199**	**18.1**	**6.1**	**1.1**	**44.1**	**167**																										
KKR-21-029	KKR-21-029-210810	0	0.3	8/10/2021	0.2 U	**4.3**	**8.9**	**48.5**	**0.073** J+	**123**	**26.8**	**5.8**	**1.4**	**95.6**	**585**																										
KKR-21-031	KKR-21-031-210810	0	0.3	8/10/2021	0.04 U	**2.2**	**3.3**	**7.3**	**0.025** J	**18.6**	**6.6**	**1.6**	**0.43**	**9.6**	**86.6**																										
KKR-21-032	KKR-21-032-00-0.7-210810	0	0.7	8/10/2021	**0.096** J	**4.1**	**7.8**	**97.5**	**0.36** J	**774**	**36.8**	**8.8**	**6.6**	**122**	**857**																										
KKR-21-032	KKR-21-032-0.7-02-210810	0.7	2	8/10/2021	0.078 U	**3.6**	**8**	**44.1**	**0.12** J	**106**	**24.8**	**5.2**	**1.3**	**83.7**	**463**																										
KKR-21-032	KKR-21-032-G-0.7-02-210810	0.7	2	8/10/2021																												**83900**									
KKR-21-033	KKR-21-033-00-0.4-210810	0	0.4	8/10/2021	**0.16** J	**7.2**	**14**	**35**	**0.13** J	**140**	**18.8**	**4.1**	**1.2**	**59.1**	**335**																										
KKR-21-033	KKR-21-033-0.4-1.2-210810	0.4	1.2	8/10/2021	**0.21** J	**12**	**25**	**80.9**	**0.42** J	**870**	**26.5**	**7**	**5.1**	**81.8**	**828**																										
KKR-21-034	KKR-21-034-00-1.0-210808	0	1	8/8/2021	0.16 U	**6.2**	**11**	**94.2**	**0.21** J+	**615**	**27.4**	**6.5**	**3.7**	**79.2**	**510**																										
KKR-21-034	KKR-21-034-01-1.2-210808	1	1.2	8/8/2021	0.043 U	**2.2**	**4**	**33.7**	**0.065** J+	**176**	**15.5**	**3.5**	**1.6**	**26**	**143**																										
KKR-21-035	KKR-21-035-00-01-210806	0	1	8/6/2021	**0.55** J	**37**	**42**	**124**	**0.97**	**771**	**30.1**	**10.4**	**7.6**	**104**	**612**																										
KKR-21-035	KKR-21-035-01-03-210806	1	3	8/6/2021	**0.34** J	**31**	**36**	**75.1**	**0.4** J+	**519**	**29.9**	**8.6**	**4.9**	**80.2**	**398**																										
KKR-21-035	KKR-21-035-03-5.5-210806	3	5.5	8/6/2021	**0.47** J	**36**	**46**	**151**	**0.54** J+	**598**	**38**	**16.2**	**12.2**	**114**	**709**																										
KKR-21-035	KKR-21-035-5.5-7.8-210806	5.5	7.8	8/6/2021	**0.43** J	**20**	**29**	**215**	**0.58** J+	**475**	**39.2**	**14.8**	**10.3**	**128**	**817**																										
KKR-21-036	KKR-21-036-00-0.8-210810	0	0.8	8/10/2021	**0.071** J	**2.7**	**5.6**	**48.9**	**0.16** J	**159**	**30.6**	**5.1**	**2**	**99**	**499**																										
KKR-21-036	KKR-21-036-0.8-1.2-210810	0.8	1.2	8/10/2021	0.11 U	**4.2**	**8.4**	**47.9**	**0.25** J	**216**	**29.3**	**5.4**	**1.8**	**101**	**467**																										
KKR-21-037	KKR-21-037-00-01-210806	0	1	8/6/2021	**0.39** J	**44**	**44**	**89.8**	**0.66** J+	**571**	**29.8**	**9.1**	**11.3**	**97.2**	**579**																										
KKR-21-037	KKR-21-037-01-03-210806	1	3	8/6/2021	0.2 U	**24**	**28**	**109**	**1.4** J+	**720**	**34.3**	**11.8**	**14.2**	**113**	**740**																										
KKR-21-037	KKR-21-037-03-05-210806	3	5	8/6/2021	**0.42** J	**27**	**30**	**151**	**0.83** J+	**756**	**42.4**	**22.7**	**12**	**128**	**771**																										
KKR-21-037	KKR-21-037-05-6.5-210806	5	6.5	8/6/2021	**0.55** J	**25**	**30**	**148**	**0.49** J+	**514**	**40**	**13.7**	**10**	**122**	**619**																										
KKR-21-038	KKR-21-038-00-01-210807	0	1	8/7/2021	**0.37** J	**35**	**36**	**117**	**0.61** J+	**617**	**36.4**	**10.6**	**16.7**	**122**	**707**																										
KKR-21-038	KKR-21-038-01-03-210807	1	3	8/7/2021	0.11 UJ	**6** J	**8.1** J	**19.7** J	**0.041** J	**68.7** J	**10.8** J	**2.6** J	**2** J	**20.9** J	**123** J																										
KKR-21-038	KKR-21-038-03-4.9-210807	3	4.9	8/7/2021	**0.31** J	**33**	**34**	**93.1** J	**0.63** J+	**842**	**42.9**	**13.6**	**10.2**	**124** J	**728**																										
KKR-21-039	KKR-21-039-00-0.4-210807	0	0.4	8/7/2021	0.25 U	**14**	**17**	**51** J	**0.38** J+	**243**	**21.4**	**4.5**	**2.6**	**80.6** J	**358**																										
KKR-21-039	KKR-21-039-0.4-1.7-210807	0.4	1.7	8/7/2021	**0.41** J	**37**	**39**	**123** J	**0.95** J+	**740**	**30.6**	**9.5**	**6.6**	**107** J	**535**																										
KKR-21-039	KKR-21-039-G-0.4-1.7-210807	0.4	1.7	8/7/2021																												**61200**									
KKR-21-039	KKR-21-039-1.7-03-210807	1.7	3	8/7/2021	**0.25** J	**30**	**32**	**59.3** J	**0.33** J+	**335**	**26.1**	**7.2**	**3.9**	**65.2** J	**302**																										
KKR-21-039	KKR-21-039-G-1.7-03-210807	1.7	3	8/7/2021																												**45400**									
KKR-21-040	KKR-21-040-00-0.9-210810	0	0.9	8/10/2021	**0.08** J	**3**	**6.1**	**54.2**	**0.23** J	**254**	**34.2**	**5.8**	**2.6**	**117**	**548**																										
KKR-21-040	KKR-21-040-0.9-1.8-210810	0.9	1.8	8/10/2021	0.092 U	**3.2**	**7.4**	**45**	**0.11** J	**116**	**26.1**	**5.1**	**1.4**	**85.6**	**463**																										
KKR-21-040	KKR-21-040-G-0.9-1.8-210810	0.9	1.8	8/10/2021																												**64500**									
KKR-21-041	KKR-21-041-00-1.3-210807	0	1.3	8/7/2021	0.17 U	**3.7**	**5.3**	**15.8** J	**0.045** J+	**82.7**	**11**	**2.2**	**1**	**33.5** J	**160**																										
KKR-21-041	KKR-21-041-1.3-2.3-210807	1.3	2.3	8/7/2021	**0.19** J	**14**	**16**	**32.8** J	**0.18** J+	**258**	**20.1**	**5.3**	**2.8**	**44.9** J	**216**																										
																																114000									
																																35900									
																																35600									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB										PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8												
WI CBSQG PEC					3										68.4												
WI CBSQG PEC					5										114												
TSCA					50																						
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KKR-21-042	KKR-21-042-00-0.9-210808	0	0.9	8/4/2021	**0.013**	0.0029 U	0.003 U	0.0014 U	0.0036 U	0.0025 U	**0.013** J-	0.0033 U	0.0036 U	0.0015 U	**4.6**	**0.024** J	**0.041**	**0.052**	**0.12**	**0.33**	**0.28**	**0.38**	**0.2**	**0.2**	**0.16**	**0.37**	**0.063**	**0.74**	**0.052**	**0.19**
KKR-21-043	KKR-21-043-00-01-210807	0	1	8/7/2021	**0.45**	**0.054**	0.0031 U	0.0014 U	0.0036 U	0.0025 U	**0.4**	0.0033 U	0.0036 U	0.0015 U	**121**	0.15 U	**1.3**	**0.61** J	**4.3**	**8.9**	**7.6**	**9.3**	**5**	**5.4**	**3.7**	**8.1**	**1.4**	**23**	**2.1**	**5.2**
KKR-21-043	KKR-21-043-01-03-210807	1	3	8/7/2021	**0.66**	**0.05**	0.0033 U	0.0015 U	0.0039 U	0.0027 U	**0.61**	0.0036 U	0.0039 U	0.0016 U	**197**	**0.36** J	**2.6**	**0.76** J	**6.3**	**15**	**11**	**16**	**7.9**	**8.1**	**5.9**	**16**	**2.5**	**36**	**4.2**	**7.7**
KKR-21-043	KKR-21-043-03-05-210807	3	5	8/7/2021	**1**	**0.17**	0.0041 U	0.0019 U	0.0049 U	0.0034 U	**0.84**	0.0045 U	0.0049 U	0.002 U	**317**	**0.91** J	**2.8**	**1.5**	**8.9**	**20**	**17**	**26**	**14**	**13**	**10**	**28**	**3.7**	**64**	**5.8**	**12**
KKR-21-043	KKR-21-043-05-5.9-210807	5	5.9	8/7/2021	**0.21**	0.0037 U	**0.21**	0.0018 U	0.0046 U	0.0032 U	0.0031 U	0.0042 U	0.0046 U	0.0019 U	**203**	**0.49** J	**1.5**	**0.84**	**4.7**	**13**	**12**	**18**	**10**	**9.9**	**7**	**18**	**2.6**	**40**	**2.8**	**9.3**
KKR-21-044	KKR-21-044-0.2-0.9-210808	0.2	0.9	8/8/2021	0.0018 U	0.0029 U	0.003 U	0.0014 U	0.0036 U	0.0025 U	0.0024 U	0.0033 U	0.0036 U	0.0015 U	**5.1**	0.0099 U	**0.028** J	**0.022** J	**0.23**	**0.43**	**0.32**	**0.42**	**0.22**	**0.21**	**0.15**	**0.38**	**0.067**	**0.91**	**0.061**	**0.2**
KKR-21-044	KKR-21-044-0.9-1.1-210808	0.9	1.1	8/8/2021	**0.018**	0.0035 U	**0.018**	0.0017 U	0.0044 U	0.003 U	0.003 U	0.004 U	0.0043 U	0.0018 U	**59.1**	0.24 U	**0.64** J	**0.21** J	**1.5**	**5**	**3.9**	**5.6**	**2.9** J	**2.8**	**2**	**5.1**	**0.83** J	**10**	**0.67** J	**2.5**
KKR-21-045	KKR-21-045-00-1.3-210808	0	1.3	8/8/2021	**0.12**	**0.08**	0.0031 U	0.0014 U	0.0036 U	0.0025 U	**0.039**	0.0033 U	0.0036 U	0.0015 U	**22.3**	0.2 U	0.24 U	**0.75** J	**0.73** J	**1.7**	**1.9**	**2.6**	1.7 U	**2.1**	**1.2**	**1.8**	0.53 U	**2.6**	0.16 U	**1.7**
KKR-21-045	KKR-21-045-G-00-1.3-210808	0	1.3	8/8/2021																										
KKR-21-046	KKR-21-046-00-1.3-210807	0	1.3	8/7/2021	**3.6**	**0.22**	0.03 U	0.014 U	0.036 U	0.025 U	**3.4**	0.033 U	0.036 U	0.015 U	**68.5**	**0.12** J	**0.96**	**0.24** J	**2.1**	**5.1**	**4**	**5.7**	**2.8**	**2.9**	**2**	**5.7**	**0.78**	**13**	**1.3**	**2.7**
KKR-21-046	KKR-21-046-1.3-1.8-210807	1.3	1.8	8/7/2021	**5.3**	**0.35**	0.035 U	0.016 U	0.042 U	0.029 U	**4.9**	0.038 U	0.042 U	0.017 U	**242**	**0.43** J	**2.8**	**0.64** J	**7.4**	**17**	**14**	**20**	**10**	**10**	**7.5**	**21**	**3**	**48**	**4.2**	**9.2**
KKR-21-046	KKR-21-046-1.8-04-210807	1.8	4	8/7/2021	**2.1**	**0.27**	0.0039 U	0.0018 U	0.0046 U	0.0032 U	**1.8**	0.0042 U	0.0046 U	0.0019 U	**191**	**0.71** J	**2.5**	**0.7** J	**4.9**	**13**	**11**	**16**	**8.5**	**8.9**	**5.1**	**16**	**2.3**	**36**	**3.8**	**7.9**
KKR-21-048	KKR-21-048-00-01-210808	0	1	8/8/2021	**0.5**	**0.061**	0.003 U	0.0013 U	0.0035 U	0.0024 U	**0.44**	0.0033 U	0.0035 U	0.0015 U	**118**	**0.19** J	**1.2**	**0.24** J	**2.7**	**8.6**	**7.3**	**9.6**	**5.3**	**6.1**	**4.1**	**9.1**	**1.5**	**22**	**1.2**	**5.3**
KKR-21-048	KKR-21-048-01-1.8-210808	1	1.8	8/8/2021	**0.65**	**0.078**	0.0029 U	0.0013 U	0.0035 U	0.0024 U	**0.57**	0.0032 U	0.0034 U	0.0014 U	**45.1**	0.093 U	**0.6**	**0.15** J	**1.7**	**3.5**	**2.6**	**3.7**	**1.9**	**1.7**	**1.4**	**3.5**	**0.61**	**8.8**	**0.75**	**1.8**
KKR-21-049	KKR-21-049-00-0.8-210808	0	0.8	8/8/2021	**0.46**	**0.066**	0.0029 U	0.0013 U	0.0034 U	0.0023 U	**0.39**	0.0031 U	0.0034 U	0.0014 U	**194**	**0.25** J	**3.1**	**0.27** J	**9.2**	**14**	**12**	**13**	**7.5**	**7.6**	**5.3**	**13**	**1.9**	**37**	**3.3**	**7.1**
KKR-21-049	KKR-21-049-0.8-03-210808	0.8	3	8/8/2021	**0.3**	0.0037 U	**0.3**	0.0017 U	0.0046 U	0.0031 U	0.0031 U	0.0042 U	0.0045 U	0.0019 U	**202**	**0.36** J	**1.3**	**0.88**	**4.1**	**13** J	**12** J	**18** J	**10** J	**9.9** J	**8.1**	**19** J	**2.5**	**40**	**2.3**	**8.8** J
KKR-21-049	KKR-21-049-03-4.4-210808	3	4.4	8/8/2021	**0.19**	0.0037 U	**0.19** J	0.0018 U	0.0046 U	0.0032 U	0.0031 U	0.0042 U	0.0046 U	0.0019 U	**142**	**0.44** J	**0.88**	**0.52** J	**2.7**	**9.3**	**9.2**	**14**	**7.9**	**7.2**	**5.1**	**13**	**1.9**	**26**	**1.5**	**6.5**
KKR-21-050	KKR-21-050-00-01-210808	0	1	8/8/2021	**0.36**	**0.095**	0.0055 U	0.0025 U	0.0065 U	0.0045 U	**0.26**	0.006 U	0.0065 U	0.0027 U	**72.7**	0.35 U	0.43 U	**0.37** J	**0.84** J	**4.7**	**5.2**	**8.7**	**4.9** J	**5.2**	**1** J	**6.8**	**1.4** J	**13**	**0.44** J	**4.8**
KKR-21-050	KKR-21-050-01-03-210808	1	3	8/8/2021	**1.1**	**0.17**	0.0038 U	0.0017 U	0.0045 U	0.0031 U	**0.94**	0.0041 U	0.0044 U	0.0018 U	**147**	**0.21** J	**1.6**	**0.47** J	**3.1**	**9.4**	**10**	**13**	**7.2**	**7.9**	**5.8**	**12**	**1.8**	**28**	**1.9**	**6.9**
KKR-21-050	KKR-21-050-03-05-210808	3	5	8/8/2021	**7.3**	**0.82**	0.038 U	0.017 U	0.045 U	0.031 U	0.031 U	0.041 U	0.045 U	**6.5**	**168**	**0.71**	**2.2**	**0.45** J	**3.6**	**11**	**10**	**15**	**8.1**	**8.2**	**5.8**	**14**	**2.1**	**31**	**2.8**	**7.3**
KKR-21-050	KKR-21-050-05-6.8-210808	5	6.8	8/8/2021	**4**	**0.5**	0.0036 U	0.0016 U	0.0042 U	0.0029 U	**3.5**	0.0039 U	0.0042 U	0.0017 U	**133**	**0.49**	**1.5**	**0.46** J	**2.9**	**9.1**	**8**	**11**	**6.2**	**5.9**	**5**	**12**	**1.6**	**25**	**2.2**	**5.6**
KKR-21-051	*KKR-21-051-00-01-210805*	0	1	8/5/2021	**0.16**	**0.053** J+	0.004 U	0.0018 U	0.0048 U	0.0033 U	**0.11** J+	0.0044 U	0.0047 U	0.002 U	**84**	**0.13** J	**0.49**	**0.52**	**1.6**	**5.8**	**6.2**	**9**	**5.1**	**6.1**	**2.6**	**7**	**1.6**	**15** J+	**0.55**	**6.2**
KKR-21-051	*KKR-21-051-G-00-01-210805*	0	1	8/5/2021																										
KKR-21-051	*KKR-21-051-01-03-210805*	1	3	8/5/2021	**1.5**	**0.3**	0.0042 U	0.0019 U	0.005 U	0.0035 U	**1.2**	0.0046 U	0.005 U	0.0021 U	**217**	**0.28** J	**2.1**	**0.73** J	**3.9**	**14**	**14**	**21**	**11**	**12**	**8.2**	**18**	**3**	**44**	**2.7**	**11**
KKR-21-051	*KKR-21-051-G-01-03-210805*	1	3	8/5/2021																										
KKR-21-051	*KKR-21-051-03-05-210805*	3	5	8/5/2021	**0.3**	**0.053**	0.0043 U	0.0019 U	0.0051 U	0.0035 U	**0.25**	0.0047 U	0.0051 U	0.0021 U	**181**	**0.62** J	**1.4**	**0.98**	**3.9**	**13**	**12**	**19**	**9.8**	**8.3**	**6**	**17**	**2.6**	**32**	**2.1**	**8.5**
KKR-21-051	*KKR-21-051-G-03-05-210805*	3	5	8/5/2021																										
KKR-21-051	*KKR-21-051-05-07-210805*	5	7	8/5/2021	0.0027 U	0.0043 U	0.0045 U	0.002 U	0.0054 U	0.0037 U	0.0036 U	0.0049 U	0.0053 U	0.0022 U	**149**	**0.78** J	**1.1**	**1**	**2.9**	**11**	**9.9**	**15**	**7.8**	**7**	**5.3**	**13**	**2.2**	**27**	**1.8**	**7**
KKR-21-051	*KKR-21-051-G-05-07-210805*	5	7	8/5/2021																										
KKR-21-052	KKR-21-052-00-01-210805	0	1	8/5/2021	**0.038**	0.0059 U	0.0063 U	0.0028 U	0.0074 U	0.0051 U	**0.038**	0.0068 U	0.0073 U	0.0031 U	**57.3**	**0.088** J	**0.24** J	**0.54**	**0.9**	**3.4**	**3.9**	**6.7**	**3.9**	**4.1**	**2.3**	**5.4**	**1.1**	**10**	**0.39**	**4**
KKR-21-052	KKR-21-052-01-03-210805	1	3	8/5/2021	**1.5**	**0.22**	0.004 U	0.0018 U	0.0047 U	0.0033 U	**1.3**	0.0043 U	0.0047 U	0.002 U	**301**	**0.38** J	**3.2**	**1.1** J	**6**	**20**	**20**	**29**	**16**	**16**	**10**	**24**	**4.1**	**61**	**3.9**	**15**
KKR-21-052	KKR-21-052-03-05-210805	3	5	8/5/2021	**1.4**	**0.22**	0.0042 U	0.0019 U	0.005 U	0.0034 U	**1.2**	0.0046 U	0.0049 U	0.0021 U	**173**	**0.51** J	**1.6**	**0.72** J	**3.7**	**12**	**11**	**18**	**8.9**	**8.2**	**5.6**	**15**	**2.6**	**30**	**2.4**	**8.2**
KKR-21-052	KKR-21-052-05-07-210805	5	7	8/5/2021	**0.037**	0.004 U	0.0042 U	0.0019 U	0.0049 U	0.0034 U	**0.037**	0.0045 U	0.0049 U	0.002 U	**73.9**	**0.78**	**0.83**	**0.73**	**2**	**5.4**	**4.7**	**6.5**	**3.4**	**3.5**	**2.1**	**5.7**	**0.99**	**12**	**1.1**	**3.3**
KKR-21-053	KKR-21-053-00-01-210805	0	1	8/5/2021	**0.21**	**0.065**	0.0042 U	0.0019 U	0.0049 U	0.0034 U	**0.14**	0.0045 U	0.0049 U	0.002 U	**225**	**1** J	**1.7**	**1.8**	**5.2**	**17**	**14**	**22**	**12**	**11**	**7.9**	**20**	**3.4**	**40**	**2.7**	**11**
KKR-21-053	KKR-21-053-01-03-210805	1	3	8/5/2021	**0.72**	**0.12**	0.0044 U	0.002 U	0.0052 U	0.0036 U	**0.6**	0.0048 U	0.0052 U	0.0022 U	**250**	**0.82** J	**2.5**	**1.4** J	**5.7**	**19**	**16**	**23**	**13**	**12**	**8.9**	**22**	**3.8**	**46**	**3.6**	**12**
KKR-21-053	KKR-21-053-03-05-210805	3	5	8/5/2021	**0.15**	**0.016**	0.0044 U	0.002 U	0.0052 U	0.0036 U	**0.13**	0.0048 U	0.0052 U	0.0022 U	**189**	**1.1**	**1.7**	**1.3**	**4.1**	**14**	**11**	**17**	**9.3**	**8.4**	**6.5**	**17**	**2.7**	**35**	**2.7**	**8.5**
KKR-21-054	KKR-21-054-0.6-0.9-210809	0.6	0.9	8/9/2021	**7.8**	**4.6**	0.039 U	0.018 U	0.046 U	0.032 U	**3.2**	0.042 U	0.046 U	0.019 U	**24.5**	0.19 U	0.22 U	**0.22** J	**0.44** J	**1.6**	**2**	**2.9**	**1.6** J	**2.5**	**0.89**	**2.1**	**0.53** J	**3.2**	**0.16** J	**2**
KKR-21-055	KKR-21-055-00-0.85-210808	0	0.8	8/8/2021	**17.9**	**8**	0.038 U	0.017 U	0.045 U	0.031 U	**9.9**	0.041 U	0.045 U	0.019 U	**435**	**1.1**	**10**	**0.54** J	**11**	**28**	**26**	**34**	**18**	**19**	**13**	**31**	**4.5**	**82**	**7.3**	**17**
KKR-21-056	KKR-21-056-00-01-210809	0	1	8/9/2021	**14**	**6.9**	0.059 U	0.027 U	0.07 U	0.048 U	**7.1**	0.064 U	0.07 U	0.029 U	**159**	**0.46** J	**2.2**	**0.48** J	**2.2**	**11**	**10**	**15**	**8.6**	**10**	**6.3**	**14**	**2.6**	**27**	**1.7**	**8.5**
KKR-21-056	KKR-21-056-01-2.9-210809	1	2.9	8/9/2021	**88**	**32**	0.12 U	0.053 U	0.14 U	0.095 U	**56**	0.13 U	0.14 U	0.057 U	**284**	**1.2** J	**4.9** J	**0.99** J	**6.4** J	**19**	**18**	**29**	**15**	**16**	**8.6**	**24**	**3.8**	**48**	**4.7**	**14**
KKR-21-057	KKR-21-057-00-01-210808	0	1	8/8/2021	**57**	**26**	0.11 U	0.048 U	0.13 U	0.088 U	**31**	0.12 U	0.13 U	0.053 U	**147**	**0.39** J	**1.3**	**0.66** J	**2.7**	**10**	**10**	**15**	**8.3**	**8.5**	**5.7**	**13**	**2.1**	**27**	**1.6**	**7.4**
KKR-21-057	KKR-21-057-01-03-210808	1	3	8/8/2021	**171**	**61**	0.58 U	0.26 U	0.69 U	0.47 U	**110**	0.63 U	0.68 U	0.28 U	**199**	**1.4**	**2.3**	**1.1**	**4.7**	**13**	**11**	**17**	**10**	**9.6**	**7.5**	**17**	**2.6**	**36**	**3.2**	**8.4**
KKR-21-057	KKR-21-057-03-4.3-210808	3	4.3	8/8/2021	**0.11**	0.006 U	0.0064 U	0.0029 U	0.0075 U	0.0052 U	**0.11**	0.0069 U	0.0075 U	0.0031 U	**173**	**2.5**	**2.1**	**2.6**	**4.5**	**13**	**9.2**	**13**	**7.5**	**7**	**5.1**	**14**	**2**	**29**	**3.1**	**6**
KKR-21-058	KKR-21-058-00-01-210819	0	1	8/19/2021	**1.8**	**0.33**	0.0062 U	0.0028 U	0.0073 U	0.005 U	**1.5**	0.0067 U	0.0073 U	0.003 U	**64.1**	**0.41**	**0.45**	**0.55**	**1.3**	**4.9**	**4.6**	**7.3**	**4**	**4.3**	**2**	**6.4**	**1.1**	**9.2**	**0.57**	**3.8**
KKR-21-058	KKR-21-058-01-03-210819	1	3	8/19/2021	**1.6**	**0.29**	0.0058 U	0.0026 U	0.0069 U	0.0047 U	**1.3**	0.0063 U	0.0068 U	0.0028 U	**107**	**0.85**	**0.57**	**1.5**	**2.3**	**9.2**	**8.4**	**12**	**6.4**	**7.5**	**3.6**	**10**	**1.8**	**15**	**0.97**	**6.2**
KKR-21-058	KKR-21-058-03-4.2-210819	3	4.2	8/19/2021	**0.38**	**0.13**	0.0056 U	0.0025 U	0.0066 U	0.0045 U	**0.25**	0.006 U	0.0065 U	0.0027 U	**85.8**	**0.79**	**0.59**	**1.2**	**1.9**	**7**	**6.4**	**8.9**	**5.4**	**5.8**	**3.7**	**8.6**	**1.7**	**11**	**0.91**	**5**
KKR-21-059	KKR-21-059-00-01-210820	0	1	8/20/2021	**2**	**0.56**	0.0073 U	0.0033 U	0.0086 U	0.0059 U	**1.4**	0.0079 U	0.0085 U	0.0035 U	**37.2**	**0.16** J	**0.19** J	**0.33** J	**0.64**	**2.6**	**3.1**	**4.7**	**2.6**	**3.1**	**1.6**	**3.1**	**0.87**	**4.7**	**0.33** J	**2.6**
KKR-21-059	KKR-21-059-01-03-210820	1	3	8/20/2021	**5.9**	**1.3**	0.0059 U	0.0026 U	0.0069 U	0.0048 U	**4.6**	0.0064 U	0.0069 U	0.0029 U	**54.3**	**0.26** J	**0.35** J	**0.52**	**1.1**	**3.7**	**4.2**	**6.1**	**3.4**	**4**	**2.2**	**4.7**	**1.1**	**8.2**	**0.53**	**3.6**
KKR-21-059	KKR-21-059-03-04-210820	3	4	8/20/2021	**14.4**	**2.4**	0.057 U	0.026 U	0.067 U	0.046 U	**12**	0.062 U	0.067 U	0.028 U	**70.2**	**0.41**	**0.43**	**0.51**	**1.3**	**4.7**	**4.9**	**7.9**	**4.2**	**4.9**	**2.6**	**6.4**	**1.4**	**11**	**0.69**	**4.5**
KKR-21-060	KKR-21-060-00-01-210820	0	1	8/20/2021	**2.3**	**0.45**	0.0063 U	0.0028 U	0.0074 U	0.0051 U	**1.8**	0.0068 U	0.0073 U	0.0031 U	**27.8**	**0.17** J	**0.17** J	**0.34**	**0.5**	**1.9**	**2.2**	**3.7**	**1.9**	**2.3**	**0.79**	**2.3**	**0.6**	**3.5**	**0.25** J	**2**
KKR-21-060	KKR-21-060-01-03-210820	1	3	8/20/2021	**0.45**	**0.13**	0.0043 U	0.0019 U	0.0051 U	0.0035 U	**0.32** J	0.0047 U	0.0051 U	0.0021 U	**79.3**	**0.99**	**0.51**	**1.4**	**1.8**	**7.1**	**6.5**	**8.3**	**4.6**	**4.9**	**2.2**	**7.2**	**1.2**	**11**	**0.89**	**4.2**
KKR-21-060	KKR-21-060-03-05-210820	3	5	8/20/2021	0.0027 U	0.0042 U	0.0045 U	0.002 U	0.0053 U	0.0036 U	0.0036 U	0.0048 U	0.0052 U	0.0022 U	**11.4**	**0.23**	**0.29**	**0.16**	**0.41**	**0.78**	**0.64**	**0.73**	**0.44** J	**0.56**	**0.26**	**0.8**	**0.12**	**1.6**	**0.26**	**0.45**
KKR-21-060	KKR-21-060-05-07-210820	5	7	8/20/2021	**0.0072**	0.004 U	0.0043 U	0.0019 U	0.005 U	0.0035 U	**0.0072** J	0.0046 U	0.005 U	0.0021 U	**14.3**	**0.28**	**0.45**	**0.18**	**0.69**	**1**	**0.84**	**0.86**	**0.49** J	**0.57**	**0.38**	**0.89**	**0.17**	**2**	**0.42**	**0.53**
KKR-21-060	KKR-21-060-07-09-210820	7	9	8/20/2021	0.0025 U	0.004 U	0.0042 U	0.0019 U	0.005 U	0.0034 U	0.0034 U	0.0046 U	0.005 U	0.0021 U	**5.6**	**0.055** J	**0.19**	**0.068**	**0.31**	**0.44**	**0.34**	**0.35**	**0.19** J	**0.23**	**0.17**	**0.38**	**0.077**	**0.81**	**0.16**	**0.22**
KKR-21-060	KKR-21-060-09-10-210820	9	10	8/20/2021	0.0028 U	0.0044 U	0.0046 U	0.0021 U	0.0055 U	0.0038 U	0.0037 U	0.005 U	0.0054 U	0.0023 U	0.06 U	0.015 U	0.018 U	0.013 U	0.016 U	0.028 U	0.027 U	0.015 U	0.12 U	0.013 U	0.018 U	0.034 U	0.039 U	0.016 U	0.012 U	0.031 U
KKR-21-061	KKR-21-061-00-01-210820	0	1	8/20/2021	**1.1**	**0.21**	0.0044 U	0.002 U	0.0052 U	0.0036 U	**0.89**	0.0048 U	0.0052 U	0.0022 U	**40.6**	**0.26**	**0.28**	**0.58**	**0.99**	**3.3**	**2.9**	**4.4**	**2.4**	**2.5**	**1.2** J-	**3.6**	**0.74**	**6.2**	**0.52**	**2.3**
KKR-21-061	KKR-21-061-01-03-210820	1	3	8/20/2021	**1.5**	**0.3**	0.005 U	0.0022 U	0.0059 U	0.0041 U	**1.2**	0.0054 U	0.0058 U	0.0024 U	**75.5**	**0.33**	**0.5**	**0.99**	**1.8**	**5.9**	**5.3**	**8.3**	**4.4**	**4.6**	**2.3** J-	**6.9**	**1.4**	**12**	**0.76**	**4.3**
KKR-21-061	KKR-21-061-03-05-210820	3	5	8/20/2021	**2.9**	**0.39**	0.0046 U	0.002 U	0.0054 U	0.0037 U	**2.5**	0.0049 U	0.0053 U	0.0022 U	**97.3**	**0.38**	**0.76**	**1.1**	**2.4**	**7.6**	**6.7**	**10**	**5.5**	**5.9**	**3.3** J-	**9**	**1.7**	**16**	**1.1**	**5.7**
KKR-21-061	KKR-21-061-05-07-210820	5	7	8/20/2021	**1.9**	**0.39**	0.0046 U	0.0021 U	0.0055 U	0.0038 U	**1.5**	0.005 U	0.0054 U	0.0023 U	**167**	**0.73**	**1.1**	**3.2**	**5.3**	**15**	**11**	**16**	**8.9**	**8.2**	**5.3** J-	**16**	**2.9**	**27**	**2.4**	**7.9**
KKR-21-061	KKR-21-061-07-09-210820	7	9	8/20/2021	**0.71**	**0.2**	0.0048 U	0.0022 U	0.0057 U	0.0039 U	**0.51**	0.0052 U	0.0057 U	0.0024 U	**118**	**1.2**	**0.84**	**2.1**	**3.1**	**10**	**8.2**	**12**	**6.9**	**6.6**	**3.9** J-	**11**	**2.1**	**17**	**1.5**	**6.3**
KKR-21-061	KKR-21-061-09-10-210820	9	10	8/20/2021	**0.33**	0.0045 U	**0.33**	0.0021 U	0.0056 U	0.0039 U	0.0038 U	0.0052 U	0.0056 U	0.0023 U	**123**	**1**	**0.87**	**1.9**	**3.2**	**9.7**	**8.3**	**12**	**7.4**	**7.5**	**4.2** J-	**11**	**2**	**19**	**1.5**	**7**
KKR-21-062	KKR-21-062-00-01-210820	0	1	8/20/2021	**0.94**	**0.34**	0.0041 U	0.0018 U	0.0048 U	0.0033 U	**0.6**	0.0044 U	0.0048 U	0.002 U	**51.7**	**0.37**	**0.65**	**0.66**	**1.4**	**4.7**	**3.5**	**5**	**2.7**	**2.7**	**1.4** J-	**4.9**	**0.84**	**8.9**	**0.77**	**2.5**
KKR-21-062	KKR-21-062-01-03-210820	1	3	8/20/2021	**1.3**	**0.46**	0.0044 U	0.002 U	0.0052 U	0.0036 U	**0.85**	0.0048 U	0.0052 U	0.0022 U	**130**	**0.96**	**1.8**	**1.9**	**3.6**	**11**	**8.5**	**11**	**6.5**	**6.4**	**3.5** J-	**12**	**1.8**	**21**	**2.2**	**5.7**
KKR-21-062	KKR-21-062-03-05-210820	3	5	8/20/2021	**0.088**	**0.023**	0.0036 U	0.0016 U	0.0043 U	0.003 U	**0.065**	0.004 U	0.0043 U	0.0018 U	**36**	**0.5**	**1**	**0.4**	**1.4**	**2.7**	**2.1**	**2.5**	**1.5**	**1.3**	**0.76** J-	**2.6**	**0.42**	**5**	**0.9**	**1.2**
KKR-21-062	KKR-21-062-05-07-210820	5	7	8/20/2021	**0.021**	**0.006** J	0.0036 U	0.0016 U	0.0043 U	0.003 U	**0.015**	0.0039 U	0.0043 U	0.0018 U	**31.5**	**0.42**	**1**	**0.59**	**1.6**	**2.5**	**1.9**	**1.9**	**1.3**	**1.1**	**0.5** J-	**2.4**	**0.33**	**3.8**	**0.83**	**0.96**
KKR-21-062	KKR-21-062-07-7.4-210820	7	7.4	8/20/2021	**0.0081**	0.003 U	0.0032 U	0.0014 U	0.0038 U	0.0026 U	**0.0081** J	0.0035 U	0.0038 U	0.0016 U	**13.5**	**0.15**	**0.51**	**0.16**	**0.7**	**1**	**0.77**	**0.76**	**0.5**	**0.45**	**0.3** J-	**0.92**	**0.14**	**1.9**	**0.35**	**0.41**
KKR-21-55A	KKR-21-55A-0.5-1.25-210810	0.5	1.2	8/10/2021	**19.8**	**12**	0.042 U	0.019 U	0.05 U	0.034 U	**7.8**	0.046 U	0.049 U	0.021 U	**67.8**	**0.2** J	**0.21** J	**0.36** J	**0.94**	**5**	**5.5**	**8.7**	**5**	**5**	**2.5**	**6.2**	**1.3**	**10**	**0.38** J	**4.4**
KKMB-SD-001	SD-001-0.0/0.5	0	0.5	5/14/2015											**2.1**	**0.032**	**0.017**	**0.039**	**0.053**	**0.13**	**0.15**	**0.2**	**0.12**	**0.12**	**0.15**	**0.17**	**0.037**	**0.29**	**0.032**	**0.14**
KKMB-SD-002	SD-002-0.0/0.5	0	0.5	5/14/2015											**108**	**1.8**	**1**	**2.1**	**4.7**	**8.8**	**7**	**5.8**	**4.6**	**3.5**	**7.2**	**8.8**	**1.3**	**16**	**2.6**	**4.4**
KKMB-SD-002	SD-002-0.5/1.5	0.5	1.5	5/14/2015											**82**	**1.2**	**0.62**	**1.4**	**2.8**	**6.8**	**5.3**	**5.5**	**3.7**	**2.8**	**4.9**	**7**	**1.2**	**13**	**1.6**	**3.6**
KKMB-SD-002	SD-002-1.5/2.5	1.5	2.5	5/14/2015											**35.1**	**0.6**	**0.33**	**0.57**	**1**	**2.6**	**2.3**	**2.3**	**1.6**	**1.2**	**2.1**	**2.9**	**0.48**	**5.2**	**0.61**	**1.5**
KKMB-SD-002	SD-002-2.5/3.9	2.5	3.9	5/14/2015											**49**	**0.96**	**0.68**	**0.74**	**1.9**	**3.7**	**2.8**	**2.6**	**1.8**	**1.4**	**2.8**	**3.6**	**0.48**	**7.3**	**1.3**	**1.7**
KKMB-SD-003	SD-003-0.0/0.5	0	0.5	5/14/2015											**77.4**	**1.6**	**1**	**1.5**	**2.4**	**6**	**5**	**4.8**	**3.4**	**2.6**	**4.8**	**6.1**	**0.89**	**10**	**1.6**	**3.3**
KKMB-SD-003	SD-003-0.5/1.5	0.5	1.5	5/14/2015											**13.3**	**0.16**	**0.13**	**0.26**	**0.4**	**1.2**	**1**	**1**	**0.66**	**0.51**	**0.9**	**1.2**	**0.19**	**2**	**0.23**	**0.67**
KKMB-SD-003	SD-003-1.5/2.5	1.5	2.5	5/14/2015											**28.6**	**0.7**	**0.36**	**0.45**	**0.93**	**2.1**	**1.7**	**1.5**	**1.1**	**0.97**	**1.7**	**2.1**	**0.37**	**4.5**	**0.62**	**1.2**
KKMB-SD-003	SD-003-2.5/3.5	2.5	3.5	5/14/2015											**26.3**	**0.66**	**0.36**	**0.42**	**0.91**	**2**	**1.6**	**1.4**	**0.98**	**0.83**	**1.5**	**1.9**	**0.31**	**4.2**	**0.61**	**1.1**
KKMB-SD-003	SD-003-3.5/4.5	3.5	4.5	5/14/2015											**52.5**	**1.2**	**0.75**	**0.8**	**1.7**	**3.9**	**2.9**	**3.5**	**1.8**	**1.

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																				Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																										
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
KKR-21-042	KKR-21-042-00-0.9-210808	0	0.9	8/8/2021	**0.021** J	**0.74**	**0.68**	**17.4** J	**0.031** J+	**258**	**29.6**	**7.3**	**0.57**	**32.2** J	**182**																	**19700**									
KKR-21-043	KKR-21-043-00-01-210807	0	1	8/7/2021	**0.24** J	**16**	**19**	**17.9**	**0.036** J+	**38.1** J	**13.9**	**3.2**	**1.2**	**81.9** J	**153**																	**46500**									
KKR-21-043	KKR-21-043-01-03-210807	1	3	8/7/2021	**0.35** J	**28**	**28**	**39.8**	**0.21** J+	**222** J	**19.5**	**5.3**	**6**	**49.6** J	**332**																	**25200**									
KKR-21-043	KKR-21-043-03-05-210807	3	5	8/7/2021	**0.49** J	**44**	**45**	**136**	**0.52** J+	**509** J	**37.8**	**14.2**	**9.1**	**116** J	**704**																	**71100**									
KKR-21-043	KKR-21-043-05-5.9-210807	5	5.9	8/7/2021	**0.42** J	**23**	**29**	**157**	**0.58** J+	**459** J	**40.4**	**18.7**	**10.8**	**120** J	**764**																	**61400**									
KKR-21-044	KKR-21-044-0.2-0.9-210808	0.2	0.9	8/8/2021	0.008 U	**0.7**	**0.76**	**16.4**	**0.075** J+	**122** J	**28**	**7.7**	**0.5**	**24.1** J	**113**																	**26200**									
KKR-21-044	KKR-21-044-0.9-1.1-210808	0.9	1.1	8/8/2021	**0.2** J	**7.1**	**8**	**48.3** J	**4.4** J+	**347**	**34.4**	**7.4**	**2.9**	**93.7** J	**641**																	**57900**									
KKR-21-045	KKR-21-045-00-1.3-210808	0	1.3	8/8/2021	0.16 U	**1.2**	**2.5**	**17.5**	**0.39** J+	**134** J	**11.8**	**5.6**	**1.2**	**36.3** J	**179**																	**79200**									
KKR-21-045	KKR-21-045-G-00-1.3-210808	0	1.3	8/8/2021																													**31.1**		**44.5**	**11.2**	**14.2**	**19.1**	**15.5**	**9**	**24.5**
KKR-21-046	KKR-21-046-00-1.3-210807	0	1.3	8/7/2021	**0.12** J	**9.2**	**9.8**	**17.4**	**0.45** J+	**88.4** J	**11.7**	**3.3**	**1.5**	**22** J	**243**																	**22800**									
KKR-21-046	KKR-21-046-1.3-1.8-210807	1.3	1.8	8/7/2021	**0.27** J	**33**	**34**	**51.2**	**0.49** J+	**270** J	**24**	**7.1**	**4.2**	**58.9** J	**324**																	**44600**									
KKR-21-046	KKR-21-046-1.8-04-210807	1.8	4	8/7/2021	**0.2** J	**26**	**27**	**67**	**0.33**	**407**	**29.2**	**8.6**	**8**	**84.5**	**526**																	**57600**									
KKR-21-048	KKR-21-048-00-01-210808	0	1	8/8/2021	**0.56** J	**15**	**18**	**25.8**	**0.021**	**36.1**	**11.1**	**2.4**	**0.77**	**25.7**	**186**																	**31500**									
KKR-21-048	KKR-21-048-01-1.8-210808	1	1.8	8/8/2021	0.076 U	**5.8**	**6.5**	**12.8**	**0.02**	**25.7**	**10.2**	**2.4**	**1.4**	**18**	**128**																	**22800**									
KKR-21-049	KKR-21-049-00-0.8-210808	0	0.8	8/8/2021	**0.51** J	**28**	**31**	**20**	**0.047**	**74.5**	**13**	**2.4**	**1.6**	**27.6**	**258**																	**29100**									
KKR-21-049	KKR-21-049-0.8-03-210808	0.8	3	8/8/2021	**0.33** J	**20** J	**31**	**143**	**0.64**	**435**	**37.8**	**15.4**	**9.9**	**112**	**781**																	**50000**									
KKR-21-049	KKR-21-049-03-4.4-210808	3	4.4	8/8/2021	**0.46** J	**14**	**21**	**191**	**0.61**	**362**	**39**	**15.9**	**24.1**	**188**	**1150**																	**59800**									
KKR-21-050	KKR-21-050-00-01-210808	0	1	8/8/2021	0.29 U	**4.8**	**10**	**46.1**	**0.15**	**138**	**24.7**	**6.1**	**1.7**	**82.7**	**436**																	**81000**									
KKR-21-050	KKR-21-050-01-03-210808	1	3	8/8/2021	**0.14** J	**16**	**22**	**125**	**0.46**	**829**	**37.6**	**8.5**	**8.3**	**134**	**1070**																	**54600**									
KKR-21-050	KKR-21-050-03-05-210808	3	5	8/8/2021	**0.28** J	**21**	**24**	**103**	**0.66**	**651**	**31.2**	**10.2**	**6.7**	**88.9**	**630**																	**47400**									
KKR-21-050	KKR-21-050-05-6.8-210808	5	6.8	8/8/2021	**0.21** J	**16**	**20**	**62.8**	**0.35**	**382**	**27.3**	**8.4**	**4.1**	**68.1**	**382**																	**36900**									
KKR-21-051	*KKR-21-051-00-01-210805*	0	1	8/5/2021	**0.16** J	**4.9**	**11**	**88.6** J	**0.34**	**470**	**38.9**	**9.1**	**5.3**	**118**	**732**																	**62200**									
KKR-21-051	*KKR-21-051-G-00-01-210805*	0	1	8/5/2021																													0 U	**6.3**	**0.7**	**4.1**	**21.5**	**48.6**	**25.1**	**73.7**
KKR-21-051	*KKR-21-051-01-03-210805*	1	3	8/5/2021	**0.35** J	**17**	**34**	**926** J	**0.45**	**1210**	**41.6**	**13**	**11.7**	**122**	**1230**																	**67300**									
KKR-21-051	*KKR-21-051-G-01-03-210805*	1	3	8/5/2021																													0 U	**9.3**	**0.4**	**2.8**	**6.1**	**52.7**	**38**	**90.7**
KKR-21-051	*KKR-21-051-03-05-210805*	3	5	8/5/2021	**2.9**	**15**	**26**	**209** J	**1.4**	**494**	**36**	**18.5**	**18.8**	**147**	**929**																	**91700**									
KKR-21-051	*KKR-21-051-G-03-05-210805*	3	5	8/5/2021																													0 U	**8.3**	**0.5**	**2.6**	**5.2**	**47.4**	**44.3**	**91.7**
KKR-21-051	*KKR-21-051-05-07-210805*	5	7	8/5/2021	**1.8**	**13**	**21**	**538** J	**4.1**	**509**	**35.3**	**16.7**	**5.7**	**212**	**1040**																	**99700**									
KKR-21-051	*KKR-21-051-G-05-07-210805*	5	7	8/5/2021																													0 U	**4.1**	**1.1**	**4.1**	**8.9**	**48.6**	**37.3**	**85.9**
KKR-21-052	KKR-21-052-00-01-210805	0	1	8/5/2021	**0.13** J	**3.4**	**6.8**	**67.2** J	**0.17**	**127**	**26.6**	**6.1**	**1.6**	**96.1**	**426**																	**55400**									
KKR-21-052	KKR-21-052-01-03-210805	1	3	8/5/2021	**0.38** J	**26**	**45**	**510** J	**0.52**	**977**	**32.8**	**10.4**	**15.4**	**99.8**	**995**																	**54200**									
KKR-21-052	KKR-21-052-03-05-210805	3	5	8/5/2021	**1.6**	**17**	**26**	**239** J	**1.7**	**470**	**32.1**	**13.9**	**4.3**	**122**	**559**																	**89400**									
KKR-21-052	KKR-21-052-05-07-210805	5	7	8/5/2021	**2.3**	**7.6**	**11**	**205** J	**2**	**213**	**22.6**	**9.7**	**1.1**	**128**	**346**																	**60900**									
KKR-21-053	KKR-21-053-00-01-210805	0	1	8/5/2021	**5**	**18**	**31**	**207** J	**1.2**	**504**	**36.9**	**20.9**	**25.4**	**572**	**1130**																	**116000**									
KKR-21-053	KKR-21-053-01-03-210805	1	3	8/5/2021	**2.6**	**24**	**34**	**226** J	**1.4**	**590**	**34.6**	**15.3**	**5.9**	**136**	**651**																	**116000**									
KKR-21-053	KKR-21-053-03-05-210805	3	5	8/5/2021	**3.3**	**19**	**26**	**688** J	**5.9**	**590**	**37.1**	**17.5**	**5.9**	**264**	**1130**																	**91100**									
KKR-21-054	KKR-21-054-0.6-0.9-210809	0.6	0.9	8/9/2021	0.15 U	**1.3**	**2.8**	**84.6**	**0.13**	**201**	**27**	**12.2**	**3.2**	**248**	**682**																	**74400**									
KKR-21-055	KKR-21-055-00-0.85-210808	0	0.8	8/8/2021	**5.1**	**64**	**63**	**166**	**0.14**	**166**	**36.9**	**12**	**3.5**	**258**	**622**																	**91000**									
KKR-21-056	KKR-21-056-00-01-210809	0	1	8/9/2021	**1.2** J	**17**	**21**	**180**	**0.36**	**223**	**36.8**	**17.3**	**4.1**	**233**	**826**																	**120000**									
KKR-21-056	KKR-21-056-01-2.9-210809	1	2.9	8/9/2021	**3.2**	**27** J	**40**	**694**	**0.63**	**494**	**67.4**	**16.1**	**7.7**	**346**	**991**																	**202000**									
KKR-21-057	KKR-21-057-00-01-210808	0	1	8/8/2021	**0.64** J	**11**	**22**	**552**	**0.58**	**467**	**58.5**	**16.5**	**7.6**	**299**	**956**																	**109000**									
KKR-21-057	KKR-21-057-01-03-210808	1	3	8/8/2021	**5.1**	**20**	**29**	**736**	**0.88**	**593**	**79.5**	**25.3**	**10**	**469**	**1160**																	**225000**									
KKR-21-057	KKR-21-057-03-4.3-210808	3	4.3	8/8/2021	**14**	**14**	**24**	**1790**	**1.7**	**653**	**33.7**	**39.2**	**30.2**	**367**	**1630**																	**339000**									
KKR-21-058	KKR-21-058-00-01-210819	0	1	8/19/2021	**0.58**	**3.9**	**8.7**	**409**	**0.63**	**458** J	**45.2**	**14.6**	**10.5**	**157**	**650**																	**163000**									
KKR-21-058	KKR-21-058-01-03-210819	1	3	8/19/2021	**2.1**	**6.1**	**13**	**451**	**0.87**	**437** J	**47.1**	**30.4**	**15.6**	**170**	**848**																	**187000**									
KKR-21-058	KKR-21-058-03-4.2-210819	3	4.2	8/19/2021	**2.2**	**4.7**	**10**	**361**	**1.7**	**375** J	**47.8**	**26.5**	**13.7**	**142**	**748**																	**139000**									
KKR-21-059	KKR-21-059-00-01-210820	0	1	8/20/2021	**0.32** J	**1.5**	**4.8**	**217** J	**0.47**	**214**	**34**	**11.1**	**4.5**	**134**	**500**																	**71200**									
KKR-21-059	KKR-21-059-01-03-210820	1	3	8/20/2021	**0.52**	**3.1**	**6.7**	**422** J	**0.65**	**359**	**36.8**	**12.4**	**8.1**	**137**	**567**																	**86400**									
KKR-21-059	KKR-21-059-03-04-210820	3	4	8/20/2021	**0.54**	**4.2**	**9.6**	**661** J	**0.71**	**604**	**51.9**	**18.5**	**13.3**	**170**	**796**																	**81200** J-									
KKR-21-060	KKR-21-060-00-01-210820	0	1	8/20/2021	**0.37**	**1.4**	**3.4**	**239** J	**0.44**	**335**	**30.3**	**10.5**	**4.4**	**97.8**	**428**																	**81100**									
KKR-21-060	KKR-21-060-01-03-210820	1	3	8/20/2021	**2.3**	**4.2**	**10**	**257** J	**0.81**	**316** J	**29.7**	**24.3**	**11.2**	**101**	**582**																	**191000** J-									
KKR-21-060	KKR-21-060-03-05-210820	3	5	8/20/2021	**0.65**	**1.3**	**1.7**	**52.4** J	**0.92**	**114**	**22.6**	**28.7**	**1**	**57.8**	**222**																	**52000**									
KKR-21-060	KKR-21-060-05-07-210820	5	7	8/20/2021	**0.87**	**1.8**	**1.9**	**36.6** J	**0.38**	**124**	**18.1**	**12.5**	**0.64**	**44.4**	**217**																	**67400** J-									
KKR-21-060	KKR-21-060-07-09-210820	7	9	8/20/2021	**0.11**	**0.72**	**0.77**	**14.8** J	**0.2**	**54.8**	**11**	**3.5**	**0.34**	**170**	**170**																	**62800** J-									
KKR-21-060	KKR-21-060-09-10-210820	9	10	8/20/2021	0.012 U	0.017 U	0.015 U	**18.7** J	**0.018** J	**6.9**	**15.7**	**2.4**	**0.27**	**16.1**	**60.1**																	**68900** J-									
KKR-21-061	KKR-21-061-00-01-210820	0	1	8/20/2021	**0.77**	**2.6**	**5.1**	**192** J	**0.33** J	**138**	**21.7**	**6.4**	**3.3**	**67.7**	**297**																	**59400** J-									
KKR-21-061	KKR-21-061-01-03-210820	1	3	8/20/2021	**1.1**	**4.8**	**9.8**	**439** J	**0.5**	**285**	**32.3**	**9.3**	**6**	**93**	**447**																	**67800**									
KKR-21-061	KKR-21-061-03-05-210820	3	5	8/20/2021	**1.1**	**7.1**	**12**	**477** J	**0.9**	**383**	**40.1**	**11.3**	**10.3**	**100**	**577**																	**70400**									
KKR-21-061	KKR-21-061-05-07-210820	5	7	8/20/2021	**1.9**	**14**	**20**	**358** J	**1.1**	**293**	**44.5**	**14.9**	**9.7**	**114**	**579**																	**69400**									
KKR-21-061	KKR-21-061-07-09-210820	7	9	8/20/2021	**4.5**	**7.2**	**14**	**469** J	**1.9**	**343**	**42.7**	**22.7**	**12.8**	**137**	**704**																	**106000**									
KKR-21-061	KKR-21-061-09-10-210820	9	10	8/20/2021	**3.2**	**7.9**	**15**	**384** J	**1.8**	**335**	**45.5**	**22.3**	**11.5**	**138**	**665**																	**133000**									
KKR-21-062	KKR-21-062-00-01-210820	0	1	8/20/2021	**0.45**	**2.9**	**7.4**	**189** J	**0.45**	**149**	**20.5**	**10**	**4.5**	**106**	**264**																	**70600**									
KKR-21-062	KKR-21-062-01-03-210820	1	3	8/20/2021	**1.2**	**13**	**18**	**188** J	**0.68**	**215**	**25.9**	**9.5**	**5.3**	**91.8**	**324**																	**30100**									
KKR-21-062	KKR-21-062-03-05-210820	3	5	8/20/2021	**0.48**	**5.5**	**5.7**	**38.8** J	**0.23**	**93.3** J	**14**	**6.6**	**1.2**	**43** J	**130**																	**65400**									
KKR-21-062	KKR-21-062-05-07-210820	5	7	8/20/2021	**0.34**	**4.6**	**5.4**	**16.8** J	**0.07**	**42.3** J	**9.1**	**2.7**	**0.49**	**13** J	**164**																	**28800**									
KKR-21-062	KKR-21-062-07-7.4-210820	7	7.4	8/20/2021	**0.18**	**2.1**	**2.2**	**8** J	**0.033** J	**25.7** J	**5.6**	**1.9**	**0.2**	**9** J	**41.3**																	**17600**									
KKR-21-55A	KKR-21-55A-0.5-1.25-210810	0.5	1.2	8/10/2021	**0.37** J	**2.4**	**9.3**	**132**	**0.27** J	**247**	**34.3**	**20.4**	**7.3**	**205**	**743**																	**118000**									
KKMB-SD-001	SD-001-0.0/0.5	0	0.5	5/14/2015	**0.14**	**0.13**	**0.18**	**37.2**	**0.148** J	**29.8**	**15.3**	**7.41** J	**1.04** J	**28.6**	**134**		**121**	7.54 U	**9260**		**917**		11.3 U	7.54 U	**0.461**	**6**		0.94 U		**22.5**	**70500**									
KKMB-SD-002	SD-002-0.0/0.5	0	0.5	5/14/2015	**9.1**	**8.5**	**11**	**713**	**2.97**	**383**	**35.9**	**47.7**	**9.89**	**182**	**902**		**220**	**7.94**	**13900**		**475**		**2.18** J	**2.43** J	**1.06**	**8.44**		**0.89** J		**32.3**	**97300**									
KKMB-SD-002	SD-002-0.5/1.5	0.5	1.5	5/14/2015	**6.7**	**5.5**	**8.4**	**484**	**1.93**	**269**	**34.4**	**29.3**	**4.14**	**130**	**662**		**191**	**6.09** J	**18400**		**430**		**1.98** J	**1.63** J	**1.2**	**9.32**		**0.67** J		**42.7**	**78100**									
KKMB-SD-002	SD-002-1.5/2.5	1.5	2.5	5/14/2015	**3.8**	**2.6**	**3.4**	**537**	**2.43**	**318**	**26.5**	**24.8**	**4.86**	**154**	**796**		**183**	**6.34** J	**10500**		**435**		**1.63** J	**2.25** J	**0.715**	**7.06**		**0.98**		**26.4**	**73100**									
KKMB-SD-002	SD-002-2.5/3.9	2.5	3.9	5/14/2015	**6**	**4.7**	**4.5**	**682**	**1.98**	**164**	**21.9**	**15.5**	**2.95**	**97.6**	**551**		**122**	6.44 U	**6990**		**368**		9.66 U	**0.877** J	**0.524**	**5.6**		**1.1**		**20.3**	**53900**									
KKMB-SD-003	SD-003-0.0/0.5	0	0.5	5/14/2015	**9.9**	**5.5**	**7**	**669**	**2.34**	**770**	**28.8**	**29.9**	**8.23**	**136**	**827**		**173**	**5.73** J	**11600**		**406**		**2.23** J	**2.04** J	**0.911**	**7.33**		**1.4**		**28.8**	**46700**									
KKMB-SD-003	SD-003-0.5/1.5	0.5	1.5	5/14/2015	**0.79**	**0.75**	**1.2**	**649**	**2.39**	**274**	**29.4**	**33.6**	**5.63**	**136**	**679**		**175**	**6.12** J	**13900**		**427**		**1.84** J	**1.27** J	**0.916**	**7.91**		**2.3**		**32.4**	**74000**									
KKMB-SD-003	SD-003-1.5/2.5	1.5	2.5	5/14/2015	**3.2**	**2.3**	**2.8**	**412**	**1.11**	**185**	**22.6**	**17.8**	**2.71**	**94.6**	**476**		**130**	**5.46** J	**10900**		**460**		**1.63** J	**1.47** J	**0.659**	**6.78**		**0.85**		**27.3**	**57600**									
KKMB-SD-003	SD-003-2.5/3.5	2.5	3.5	5/14/2015	**2.8**	**2.2**	**2.5**	**198**	**0.619**	**54.9**	**10.5**	**7.39**	**0.809** J	**33.1**	**165**		**53.5**	5.52 U	**4860**		**327**		8.29 U	**0.79** J	**0.328**	**3.89**		**0.61** J		**14.9**	**19900**									
KKMB-SD-003	SD-003-3.5/4.5	3.5	4.5	5/14/2015	**6.2**	**4.2**	**5**	**288**	**0.778**	**72**	**14.7**	**9.84**	**1.08** J	**48.2**	**219**		**68**	6.08 U	**6340**		**409**		9.12 U	**0.916** J	**0.427**	**5.16**		**1.8**		**18.8**	**45500**									
KKMB-SD-003	SD-003-4.5/5.6	4.5	5.6	5/14/2015	**7.7**	**7.4**	**12**	**1340**	**3.53**	**240**	**29.2**	**22.5**	**2.76**	**140**	**685**		**176**	**5.82** J	**11200**		**437**		**1.94** J	**1.92** J	**0.819**	**7.46**		**2.3**		**28.5**	**67600**									
KKMB-SD-003	SD-003-5.6/5.9	5.6	5.9	5/14/2015	**0.14**	**0.39**	**0.25**	**27.6**	0.313 U	**16.7**	**17.6**	**5.64** J	**0.523** J	**17.4**	**63.6**		**115**	**5.06** J	**10200**		**830**		**1.63** J	6.33 U	**0.485**	**7.34**		0.78 U		**23.3**	**23200**									
KKMB-SD-004	SD-004-0.0/0.5	0	0.5	5/13/2015	**0.15** J	**0.13** J	**0.25** J	**53.4**	**0.121** J	**51.5**	**22**	**10.8**	**1.24** J	**44.6**	**166**		**96.5**	**4.98** J	**10400**		**634**		9.51 U	6.34 U	**0.614**	**6.59**		**0.67** J		**25.1**	**23700**									

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

					PCB										PAH												
Analyte Group					PCB										PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8												
WI CBSQG PEC					3										68.4												
WI CBSQG PEC					5										114												
TSCA					50																						
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KKMB-SD-004	SD-004-0.5/1.5	0.5	1.5	5/13/2015	**0.042**	0.03 U	**0.015 J**	0.03 U	0.03 UJ	0.03 UJ	**0.027 J**	0.03 UJ	0.03 UJ	0.03 UJ	**0.84**	**0.01 J**	**0.0065 J**	**0.014 J**	**0.018 J**	**0.051 J**	**0.058 J**	**0.079 J**	**0.049 J**	**0.045 J**	**0.047 J**	**0.067 J**	**0.012 J**	**0.12 J**	**0.012 J**	**0.053 J**
KKMB-SD-004	SD-004-1.5/2.3	1.5	2.3	5/13/2015	0.014 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	**0.08**	**0.0014 J**	0.0028 UJ	**0.0015 J**	**0.0018 J**	**0.0048 J**	**0.0054 J**	**0.0055 J**	**0.0048 J**	**0.0043 J**	**0.0056 J**	**0.0067 J**	0.0028 UJ	**0.011 J**	**0.0019 J**	**0.0047 J**
KKMB-SD-004B	SD-004B-0.5/1.5	0.5	2.3	5/13/2015	0.015 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	**0.19**	**0.015 J**	**0.0052 J**	**0.0014 J**	**0.012 J**	**0.0061 J**	**0.007 J**	**0.0078 J**	**0.0064 J**	**0.0055 J**	**0.0078 J**	**0.0093 J**	**0.0014 J**	**0.017 J**	**0.007 J**	**0.0062 J**
KKMB-SD-004B	SD-004B-1.5/3.8	1.5	3.8	5/13/2015	0.015 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	0.029 U	**0.048**	0.0028 UJ	0.0028 UJ	0.0028 UJ	0.0028 UJ	**0.0027 J**	**0.0027 J**	**0.0031 J**	**0.0027 J**	**0.0021 J**	**0.0028 J**	**0.0038 J**	0.0028 UJ	**0.0064 J**	**0.0016 J**	**0.0021 J**
KKMB-SD-005	SD-005-0.0/0.5	0	0.5	5/13/2015											**12.7**	**0.15**	**0.081**	**0.18**	**0.25**	**0.93**	**1**	**1**	**0.77**	**0.77**	**0.94**	**1.1**	**0.22**	**1.8**	**0.16**	**0.85**
KKMB-SD-005	SD-005-0.5/1.5	0.5	1.5	5/13/2015											**18.5**	**0.26**	**0.12**	**0.27**	**0.39**	**1.5**	**1.4**	**1.5**	**1.1**	**0.94**	**1.2**	**1.7**	**0.29**	**2.6**	**0.27**	**1.1**
KKMB-SD-005	SD-005-1.5/2.5	1.5	2.5	5/13/2015											**10.8**	**0.18 J**	**0.085 J**	**0.16 J**	**0.31 J**	**0.85**	**0.78**	**0.84**	**0.58**	**0.52**	**0.64**	**0.92**	**0.16**	**1.6**	**0.21 J**	**0.62**
KKMB-SD-005	SD-005-2.5/3.5	2.5	3.5	5/13/2015											**5.8**	**0.054 J**	**0.058 J**	**0.068 J**	**0.16 J**	**0.47 J**	**0.34 J**	**0.42 J**	**0.28 J**	**0.17 J**	**0.29 J**	**0.51 J**	**0.057 J**	**1.1 J**	**0.09 J**	**0.21 J**
KKMB-SD-005	SD-005-3.5/4.5	3.5	4.5	5/13/2015											**0.71**	**0.011 J**	**0.0065 J**	**0.013 J**	**0.02 J**	**0.054**	**0.05**	**0.047**	**0.039**	**0.032**	**0.052**	**0.061**	**0.0094 J**	**0.11**	**0.012 J**	**0.038**
KKMB-SD-005	SD-005-4.5/5.5	4.5	5.5	5/13/2015											**0.47**	**0.012 J**	0.011 U	**0.009 J**	**0.013 J**	**0.032**	**0.031**	**0.03**	**0.025**	**0.025**	**0.03**	**0.037**	**0.0068 J**	**0.069**	**0.0081 J**	**0.029**
KKMB-SD-005	SD-005-5.5/6.4	5.5	6.4	5/13/2015											**0.68**	**0.025 J**	0.02 UJ	**0.015 J**	**0.016 J**	**0.041 J**	**0.045 J**	**0.035 J**	**0.032 J**	**0.033 J**	**0.042 J**	**0.048 J**	**0.0099 J**	**0.092 J**	**0.014 J**	**0.037 J**
KKMB-SD-006	SD-006-0.0/0.5	0	0.5	5/11/2015											**33.9**	**0.57 J**	**0.27 J**	**0.46 J**	**0.94 J**	**2.6 J**	**2.3 J**	**4 J**	**1.8 J**	**1.9 J**	**1 J**	**2.5 J**	**0.84 J**	**4.5 J**	**0.76 J**	**2.3 J**
KKMB-SD-006	SD-006-0.5/1.5	0.5	1.5	5/11/2015											**6.4**	**0.13 J**	**0.11 J**	**0.085 J**	**0.17 J**	**0.46 J**	**0.44 J**	**0.49 J**	**0.35 J**	**0.28 J**	**0.42 J**	**0.54 J**	**0.081 J**	**0.86 J**	**0.13 J**	**0.34 J**
KKMB-SD-006	SD-006-1.5/2.5	1.5	2.5	5/11/2015											**17.6**	**0.22**	**0.099**	**0.23**	**0.44**	**1.5**	**1.5**	**1.5**	**1**	**0.92**	**1.2**	**1.6**	**0.32**	**2.2**	**0.16**	**1**
KKMB-SD-006	SD-006-2.5/3.5	2.5	3.5	5/11/2015											**6.8**	**0.083**	**0.046**	**0.076**	**0.14**	**0.5**	**0.54**	**0.58**	**0.43**	**0.4**	**0.5**	**0.63**	**0.12**	**0.8**	**0.081**	**0.44**
KKMB-SD-006	SD-006-3.5/4.5	3.5	4.5	5/11/2015											**7.8**	**0.086**	**0.048**	**0.093**	**0.15**	**0.62**	**0.63**	**0.65**	**0.48**	**0.47**	**0.46**	**0.71**	**0.13**	**0.92**	**0.089**	**0.53**
KKMB-SD-006	SD-006-4.5/5.5	4.5	5.5	5/11/2015											**12.9**	**0.12**	**0.098**	**0.16**	**0.33**	**1.2**	**1**	**1.1**	**0.75**	**0.58**	**0.6**	**1.3**	**0.25**	**1.9**	**0.18**	**0.66**
KKMB-SD-006	SD-006-5.5/6.5	5.5	6.5	5/11/2015											**7.5**	**0.18**	**0.094**	**0.072**	**0.2**	**0.6**	**0.42**	**0.47**	**0.34**	**0.25**	**0.36**	**0.68**	**0.084**	**1.4**	**0.19**	**0.27**
KKMB-SD-006	SD-006-6.5/7.5	6.5	7.5	5/11/2015											**2.5**	**0.1 J**	**0.025 J**	**0.024 J**	**0.056 J**	**0.17 J**	**0.14 J**	**0.2 J**	**0.15 J**	**0.12 J**	**0.12 J**	**0.27 J**	**0.048 J**	**0.26 J**	**0.051 J**	**0.11 J**
KKMB-SD-006	SD-006-7.5/8.0	7.5	8	5/11/2015											**0.54**	**0.037**	**0.0049 J**	**0.0063 J**	**0.011**	**0.031**	**0.024**	**0.037**	**0.027**	**0.024**	**0.021**	**0.059**	**0.009 J**	**0.048**	**0.02**	**0.022**
KKMB-SD-007	SD-007-0.0/0.5	0	0.5	5/11/2015	**0.65**	0.04 U	**0.23**	0.04 U	0.04 U	0.04 U	**0.42**	0.04 U	0.04 U	0.04 U	**3.7**	**0.029**	**0.024**	**0.033**	**0.051**	**0.25**	**0.31**	**0.38**	**0.26**	**0.26**	**0.28**	**0.34**	**0.065**	**0.4**	**0.039**	**0.28**
KKMB-SD-007	SD-007-0.5/1.5	0.5	1.5	5/11/2015	**0.42**	0.039 U	**0.16**	0.039 U	0.039 U	0.039 U	**0.26**	0.039 U	0.039 U	0.039 U	**2.7**	**0.019**	**0.012**	**0.023**	**0.036**	**0.17**	**0.23**	**0.28**	**0.2**	**0.2**	**0.22**	**0.24**	**0.048**	**0.34**	**0.024**	**0.22**
KKMB-SD-007	SD-007-1.5/2.5	1.5	2.5	5/11/2015	**3.1**	0.17 U	**0.73**	0.17 U	0.17 U	0.17 U	**2.4**	0.17 U	0.17 U	0.17 U	**4.9**	**0.049**	**0.032**	**0.039**	**0.092**	**0.34**	**0.39**	**0.44**	**0.32**	**0.29**	**0.36**	**0.44**	**0.084**	**0.66**	**0.056**	**0.32**
KKMB-SD-007	SD-007-2.5/3.5	2.5	3.5	5/11/2015	**1.2**	0.15 U	**0.4**	0.15 U	0.15 U	0.15 U	**0.77**	0.15 U	0.15 U	0.15 U	**6.9**	**0.075**	**0.046**	**0.063**	**0.11**	**0.5**	**0.54**	**0.54**	**0.46**	**0.45**	**0.51**	**0.59**	**0.12**	**0.96**	**0.077**	**0.5**
KKMB-SD-007	SD-007-3.5/4.0	3.5	4	5/11/2015	**1.1**	0.13 U	**0.4**	0.13 U	0.13 U	0.13 U	**0.72**	0.13 U	0.13 U	0.13 U	**9.7**	**0.11**	**0.086**	**0.067**	**0.2**	**0.74**	**0.71**	**0.68**	**0.53**	**0.51**	**0.68**	**0.85**	**0.13**	**1.5**	**0.13**	**0.57**
KKMB-SD-008	SD-008-0.0/0.5	0	0.5	5/11/2015											**8**	**0.047**	**0.058**	**0.047**	**0.12**	**0.6**	**0.56**	**0.71**	**0.47**	**0.42**	**0.62**	**0.73**	**0.1**	**1.4**	**0.096**	**0.47**
KKMB-SD-008	SD-008-0.5/1.5	0.5	1.5	5/11/2015											**5.5**	**0.034**	**0.033**	**0.059 J**	**0.1 J**	**0.45 J**	**0.44 J**	**0.5 J**	**0.34 J**	**0.3 J**	**0.4 J**	**0.54 J**	**0.096 J**	**0.81 J**	**0.063**	**0.34 J**
KKMB-SD-008	SD-008-1.5/2.5	1.5	2.5	5/11/2015											**5.6**	**0.068**	**0.046**	**0.066**	**0.11**	**0.42**	**0.43**	**0.49**	**0.34**	**0.31**	**0.45**	**0.5**	**0.081**	**0.64 J**	**0.084**	**0.35**
KKMB-SD-008	SD-008-2.5/3.5	2.5	3.5	5/11/2015											**18.4**	**0.42 J**	**0.16 J**	**0.24 J**	**0.58 J**	**1.4 J**	**1.2 J**	**1.5 J**	**0.86 J**	**0.82 J**	**1.1 J**	**1.5 J**	**0.28 J**	**3 J**	**0.27 J**	**0.98 J**
KKMB-SD-008	SD-008-3.5/4.6	3.5	4.6	5/11/2015											**7.7**	**0.099**	**0.055**	**0.2**	**0.15**	**0.73 J**	**0.66 J**	**0.61 J**	**0.41**	**0.4**	**0.56**	**0.73 J**	**0.12**	**0.93 J**	**0.06**	**0.47**
KKMB-SD-008	SD-008-4.6/5.3	4.6	5.3	5/11/2015											**0.043**	**0.0016 J**	0.0019 U	**0.0008 J**	0.0019 U	**0.0027**	**0.0023**	**0.0026**	**0.0025**	**0.0025**	**0.002**	**0.0059**	0.0019 U	**0.0049**	**0.0009 J**	**0.0017 J**
KKMB-SD-009	SD-009-0.0/0.5	0	0.5	5/13/2015											**14.7**	**0.15**	**0.097**	**0.13**	**0.32**	**1.1**	**1.2**	**1.3**	**0.9**	**0.87**	**1.1**	**1.3**	**0.24**	**1.8**	**0.21**	**1**
KKMB-SD-009	SD-009-0.5/1.5	0.5	1.5	5/13/2015											**14.5**	**0.16**	**0.095**	**0.19**	**0.34**	**1.1**	**1.1**	**1.1**	**0.85**	**0.74**	**1.1**	**1.3**	**0.23**	**1.9**	**0.21**	**0.91**
KKMB-SD-009	SD-009-1.5/2.5	1.5	2.5	5/13/2015											**17.7**	**0.2 J**	**0.14 J**	**0.21 J**	**0.51 J**	**1.2 J**	**1.2 J**	**1.3 J**	**0.91 J**	**0.74 J**	**0.97 J**	**1.6 J**	**0.23 J**	**2.8 J**	**0.31 J**	**0.9 J**
KKMB-SD-009	SD-009-2.5/3.5	2.5	3.5	5/13/2015											**13**	**0.22**	**0.1**	**0.14**	**0.3**	**0.83**	**0.85 J**	**1**	**0.71 J**	**0.64 J**	**0.82**	**1.1**	**0.19 J**	**1.9**	**0.21**	**0.71 J**
KKMB-SD-009	SD-009-3.5/4.5	3.5	4.5	5/13/2015											**18.5**	**0.38**	**0.18**	**0.17**	**0.51**	**1.1**	**1.2**	**1.4**	**1**	**0.88**	**1.3**	**1.5**	**0.24**	**2.9**	**0.34**	**1.1**
KKMB-SD-009	SD-009-4.5/5.5	4.5	5.5	5/13/2015											**20.2**	**0.29**	**0.15**	**0.23**	**0.5**	**1.5**	**1.5**	**1.5**	**1.1**	**1.1**	**1.3**	**1.6**	**0.31**	**2.9**	**0.34**	**1.4**
KKMB-SD-009	SD-009-5.5/6.5	5.5	6.5	5/13/2015											**10.5**	**0.13 J**	**0.1 J**	**0.18 J**	**0.31 J**	**0.81 J**	**0.72 J**	**0.7 J**	**0.53 J**	**0.36 J**	**0.7 J**	**0.89 J**	**0.11 J**	**1.6 J**	**0.2 J**	**0.44 J**
KKMB-SD-009	SD-009-6.5/7.5	6.5	7.5	5/13/2015											**12.2**	**0.22**	**0.13**	**0.19**	**0.31**	**0.91**	**0.83 J**	**0.76**	**0.62 J**	**0.53 J**	**0.84**	**1**	**0.17 J**	**1.8**	**0.24**	**0.6 J**
KKMB-SD-009	SD-009-7.5/8.5	7.5	8.5	5/13/2015											**1.8**	**0.024 J**	**0.026 J**	**0.033 J**	**0.057 J**	**0.14 J**	**0.12 J**	**0.13 J**	**0.087 J**	**0.067 J**	**0.1 J**	**0.15 J**	**0.021 J**	**0.29 J**	**0.035 J**	**0.082 J**
KKMB-SD-009	SD-009-8.5/9.5	8.5	9.5	5/13/2015											**0.11**	0.0099 U	0.0099 U	**0.0046 J**	0.0099 U	**0.0061 J**	**0.0049 J**	**0.0049 J**	**0.0047 J**	**0.0045 J**	**0.0049 J**	**0.0084 J**	0.0099 U	**0.014**	0.0099 U	**0.0042 J**
KKMB-SD-009	SD-009-9.5/10.5	9.5	10.5	5/13/2015											**0.021**	0.002 U	0.002 U	0.002 U	0.002 U	**0.0008 J**	0.002 U	**0.0008 J**	**0.001 J**	0.002 U	0.002 U	**0.0022**	0.002 U	**0.0015 J**	0.002 U	0.002 U
KKMB-SD-009	SD-009-10.5/11.8	10.5	11.8	5/13/2015											**0.021**	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	**0.0011 J**	0.002 U	0.002 U	0.002 U	**0.0023**	0.002 U	**0.0011 J**	0.002 U	0.002 U
KKMB-SD-010	SD-010-0.0/0.5	0	0.5	5/14/2015											**2.9**	**0.03 J**	**0.017 J**	**0.044**	**0.065**	**0.2**	**0.23**	**0.24**	**0.18**	**0.17**	**0.24**	**0.26**	**0.049**	**0.38**	**0.033 J**	**0.2**
KKMB-SD-010	SD-010-0.5/1.5	0.5	1.5	5/14/2015											**3.7**	**0.045**	**0.021 J**	**0.059**	**0.087**	**0.26**	**0.28**	**0.3**	**0.22**	**0.19**	**0.29**	**0.33**	**0.057**	**0.49**	**0.045**	**0.23**
KKMB-SD-010	SD-010-1.5/2.5	1.5	2.5	5/14/2015											**3.3**	**0.032 J**	**0.024 J**	**0.052**	**0.091**	**0.23**	**0.23**	**0.25**	**0.18**	**0.15**	**0.22**	**0.29**	**0.043**	**0.5**	**0.046**	**0.18**
KKMB-SD-010	SD-010-2.5/3.5	2.5	3.5	5/14/2015											**2.8**	**0.027 J**	**0.021 J**	**0.048**	**0.078**	**0.2**	**0.21**	**0.24**	**0.16**	**0.14**	**0.2**	**0.25**	**0.042**	**0.37**	**0.037**	**0.17**
KKMB-SD-010	SD-010-3.5/5.0	3.5	5	5/14/2015											**16.5**	**0.17 J**	**0.095 J**	**0.24**	**0.45**	**1.2**	**1.2**	**1.5**	**0.95**	**0.76**	**1.1**	**1.5**	**0.23 J**	**2.4**	**0.21 J**	**0.93**
KKMB-SD-011	SD-011-0.0/0.5	0	0.5	5/13/2015											**20**	**0.27 J**	**0.11 J**	**0.26 J**	**0.45 J**	**1.3 J**	**1.5 J**	**1.6 J**	**1.2 J**	**1.1 J**	**1.5 J**	**1.7 J**	**0.3 J**	**2.7 J**	**0.26 J**	**1.3 J**
KKMB-SD-011	SD-011-0.5/1.5	0.5	1.5	5/13/2015											**17.8**	**0.23 J**	**0.1 J**	**0.25 J**	**0.42 J**	**1.3 J**	**1.3 J**	**1.4 J**	**0.99 J**	**0.88 J**	**1.3 J**	**1.5 J**	**0.26 J**	**2.5 J**	**0.24 J**	**1.1 J**
KKMB-SD-011	SD-011-1.5/2.5	1.5	2.5	5/13/2015											**24.5**	**0.34 J**	**0.17 J**	**0.34 J**	**0.66 J**	**1.8 J**	**1.8 J**	**1.8 J**	**1.4 J**	**1.1 J**	**1.6 J**	**2.1 J**	**0.41 J**	**4 J**	**0.4 J**	**1.4 J**
KKMB-SD-011	SD-011-2.5/3.1	2.5	3.1	5/13/2015											**19.8**	**0.22 J**	**0.12 J**	**0.28 J**	**0.47 J**	**1.4 J**	**1.4 J**	**1.9 J**	**1 J**	**0.9 J**	**1.4 J**	**1.7 J**	**0.27 J**	**2.9 J**	**0.27 J**	**1.1 J**
KKMB-SD-011	SD-011-3.1/4.0	3.1	4	5/13/2015											**0.26**	0.013 U	0.013 U	0.013 U	**0.0096 J**	**0.014 J**	**0.012 J**	**0.011 J**	**0.0088 J**	**0.0092 J**	**0.011 J**	**0.017 J**	0.013 U	**0.046 J**	**0.0091 J**	**0.01 J**
KKMB-SD-012	SD-012-0.0/0.5	0	0.5	5/14/2015											**5.5**	**0.061**	**0.041**	**0.069**	**0.13**	**0.37**	**0.42**	**0.44**	**0.3**	**0.25**	**0.35**	**0.49**	**0.071**	**0.92**	**0.067**	**0.31**
KKMB-SD-012	SD-012-0.5/1.5	0.5	1.5	5/14/2015											**4.9**	**0.044**	**0.031 J**	**0.068**	**0.1**	**0.32**	**0.37**	**0.46**	**0.3**	**0.28**	**0.35**	**0.42**	**0.076**	**0.69**	**0.062**	**0.34**
KKMB-SD-012	SD-012-1.5/2.5	1.5	2.5	5/14/2015											**8.3**	**0.083**	**0.05**	**0.12**	**0.18**	**0.56**	**0.64**	**0.78**	**0.51**	**0.47**	**0.64**	**0.72**	**0.14**	**1.1**	**0.086**	**0.58**
KKMB-SD-012	SD-012-2.5/3.5	2.5	3.5	5/14/2015											**11.1**	**0.13**	**0.063**	**0.16**	**0.26**	**0.78**	**0.86**	**0.92**	**0.66**	**0.59**	**0.86**	**0.98**	**0.17**	**1.5**	**0.13**	**0.73**
KKMB-SD-012	SD-012-3.5/4.5	3.5	4.5	5/14/2015											**9.8**	**0.097**	**0.069**	**0.15**	**0.32**	**0.69**	**0.66**	**0.69**	**0.53**	**0.42**	**0.71**	**0.82**	**0.19**	**1.3**	**0.2**	**0.67**
KKMB-SD-012	SD-012-4.5/5.5	4.5	5.5	5/14/2015											**35.7**	**0.62**	**0.38**	**0.51**	**1.1**	**2.5**	**2.3**	**2.5**	**1.8**	**1.1**	**1.9**	**2.9**	**0.33**	**4.2**	**0.89**	**1.3**
KKMB-SD-012	SD-012-5.5/6.5	5.5	6.5	5/14/2015											**26.2**	**0.45**	**0.21**	**0.34**	**0.68**	**1.8**	**1.6**	**1.8**	**1.4**	**0.94**	**1.3**	**2.2**	**0.29**	**3.4**	**0.55**	**1.1**
KKMB-SD-012	SD-012-6.5/7.5	6.5	7.5	5/14/2015											**68.5**	**0.67**	**0.41**	**1.1**	**2.3**	**5.4**	**4.9**	**6.3**	**3.4**	**3**	**3.8**	**5.5**	**1**	**9.9**	**1**	**3.3**
KKMB-SD-012	SD-012-7.5/8.5	7.5	8.5	5/14/2015											**80.3**	**1.3**	**0.91**	**1.3**	**2.7**	**5.8**	**5.2**	**5.6**	**3.7**	**2.8**	**4.1**	**6.3**	**1.2**	**11**	**1.8**	**3.9**
KKMB-SD-012	SD-012-8.5/9.5	8.5	9.5	5/14/2015											**42**	**0.54**	**0.29**	**0.73**	**1.2**	**3.5**	**3**	**3.3**	**2.2**	**1.6**	**2.7**	**3.7**	**0.55**	**5.6**	**0.82**	**2**
KKMB-SD-012	SD-012-9.5/10.5	9.5	10.5	5/14/2015											**32.8**	**0.52**	**0.28**	**0.55**	**1**	**2.8**	**2.2**	**2.1**	**1.5**	**0.9**	**2.1**	**2.9**	**0.33**	**3.8**	**0.74**	**1.2**
KKMB-SD-012	SD-012-10.5/12.2	10.5	12.2	5/14/2015											**14.3**	**0.21**	**0.14**	**0.28**	**0.41**	**1**	**0.83**	**0.84**	**0.58**	**0.47**	**0.78**	**1.1**	**0.2**	**2.3**	**0.25**	**0.74**
KKMB-SD-013	SD-013-0.0/0.5	0	0.5	5/14/2015	**1.3**	**0.14 J**	**0.41**	0.18 U	0.18 U	0.18 U	**0.73**	0.18 U	0.18 U	0.18 U	**9.4**	**0.11**	**0.049**	**0.081**	**0.2**	**0.69**	**0.78**	**0.88**	**0.61**	**0.57**	**0.63**	**0.69**	**0.16**	**1.2**	**0.11**	**0.69**
KKMB-SD-013	SD-013-0.5/1.5	0.5	1.5	5/14/2015	**1.2**	**0.13 J**	**0.32**	0.17 U	0.17 U	0.17 U	**0.7**	0.17 U	0.17 U	0.17 U	**8.3**	**0.088**	**0.043**	**0.073**	**0.14**	**0.66**	**0.7**	**0.67**	**0.53**	**0.5**	**0.54**	**0.78**	**0.14**	**1.1**	**0.092**	**0.56**
KKMB-SD-013	SD-013-1.5/2.5	1.5	2.5	5/14/2015	**1.2**	0.16 U	**0.39**	0.16 U	0.16 U	0.16 U	**0.82**	0.16 U	0.16 U	0.16 U	**6.5**	**0.073**	**0.041**	**0.069**	**0.11**	**0.48**	**0.52**	**0.62**	**0.39**	**0.38**	**0.41**	**0.57**	**0.1**	**0.96**	**0.083**	**0.43**
KKMB-SD-013	SD-013-2.5/3.5	2.5	3.5	5/14/2015	**0.88**	0.16 U	**0.27**	0.16 U	0.16 U	0.16 U	**0.61**	0.16 U	0.16 U	0.16 U	**7.9**	**0.093 J**	**0.042 J**	**0.067 J**	**0.13 J**	**0.6**	**0.64**	**0.6**	**0.49**	**0.48**	**0.58**	**0.7**	**0.13**	**1.2**	**0.098 J**	**0.54**
KKMB-SD-013	SD-013-3.5/4.5	3.5	4.5	5/14/2015	**1.1**	0.16 U	**0.34**	0.16 U	0.16 U	0.16 U	**0.72**	0.16 U	0.16 U	0.16 U	**6.2**	**0.066 J**	**0.03 J**	**0.049 J**	**0.098 J**	**0.47 J**	**0.51 J**	**0.57 J**	**0.36 J**	**0.34 J**	**0.39 J**	**0.57 J**	**0.09 J**	**0.92 J**	**0.059 J**	**0.38 J**
KKMB-SD-013	SD-013-4.5/5.5	4.5	5.5	5/14/2015	**0.52**	0.033 U	**0.18**	0.033 U	0.033 U	0.033 U	**0.34**	0.033 U	0.033 U	0.033 U	**8**	**0.09**	**0.049**	**0.087**	**0.22**	**0.63**	**0.61**	**0.6**	**0.48**	**0.45**	**0.5**	**0.72**	**0.14**	**1.2**	**0.1**	**0.52**
KKMB-SD-013	SD-013-5.5/6.5	5.5	6.5	5/14/2015	**1.2**	0.16 U	**0.43**	0.16 U	0.16 U	0.16 U	**0.75**	0.16 U	0.16 U	0.16 U	**11**	**0.091 J**	**0.062 J**	**0.087 J**	**0.27 J**	**0.82 J**	**0.84**	**0.79 J**	**0.62**	**0.6**	**0.81 J**	**0.98 J**	**0.19**	**1.7 J**	**0.13 J**	**0.68**
KKMB-SD-013	SD-013-6.5/7.5	6.5	7.5	5/14/2015	**0.94**	0.16 U	**0.59**	0.16 U	0.16 U	0.16 U	**0.35**	0.16 U	0.16 U	0.16 U	**27.4**	**0.37**	**0.21**	**0.27**	**0.85**	**1.9**	**1.8**	**1.9**	**1.3**	**1.2**	**1.4**	**2.1**	**0.33**	**3.8**	**0.69**	**1.3**
KKMB-SD-013	SD-013-7.5/8.5	7.5	8.5	5/14/2015	0.016 U	0.031 U	0.031 UJ	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	**78**	**0.83 J**	**0.55 J**	**0.92 J**	**2.4 J**	**5.7 J**	**4.8 J**	**4.7 J**	**3.2 J**	**3 J**	**3.9 J**	**5.8 J**	**0.9 J**	**11 J**	**2.4 J**	**3.4 J**
KKMB-SD-013	SD-013-8.5/9.5	8.5	9.5	5/14/2015	**0.078**	0.031 U	**0.032 J**	0.031 U	0.031 U	0.031 U	**0.046**	0.031 U	0.031 U	0.031 U	**182**	**2.5**	**1.3**	**3.2**	**5.7**	**14**	**12**	**12**	**8.3**	**6.3**	**11**	**14**	**2.5**	**22**	**4**	**8.3**
KKMB-SD-013	SD-013-9.5/10.5	9.5	10.5	5/14/2015	0.016 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	**162**	**2.9**	**2.7**	**2.5**	**7.3**	**11**	**8.8**	**8.8**	**6.2**	**4.8**	**7.5**	**12**	**2**	**23**	**5.5**	**5.9**
KKMB-SD-013	SD-013-10.5/11.5	10.5	11.5	5/14/2015	0.016 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	**123**	**1.8**	**1.1**	**2.1**	**4.3**	**9.4**	**7.6**	**7.4**	**5.4**	**4.2**	**7.7**	**9.8**	**1.7**	**17**	**3**	**5.2**
KKMB-SD-013	SD-013-11.5/13.0	11.5	13	5/14/2015	0.016 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	**192**	**4.7**	**5.8**	**2.8**	**9.8**	**14**	**11**	**10**	**7.3**	**5.7**	**9.7**	**14**	**2.1**	**26**	**7.8**	**7**
KK-SDA11	KK-SDA11-0.0/0.3	0	0.3	12/12/2012		**0.059 J**	0.077 U						0.077 U	0.077 U	**91.1**	**0.244**	**0.549**	**0.388**	**1.67**	**6.82**	**8.89**	**10.1**	**7.06**	**6.42**				**18**	**0.805**	**6.84**
KK-SDA11	KK-SDA11-0.3/2.0	0.3	2	12/12/2012		**0.021 J**	0.044 U						0.044 U	0.044 U	**23.6**	**0.0589**	**0.167**	**0.099**	**0.458**	**1.68**	**2.26**	**2.48**	**1.75**	**1.73**				**4.67**	**0.253**	**1.84**

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals																							Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25															
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75															
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125															
TSCA																																							
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	Chromium mg/kg	Mercury mg/kg	Lead mg/kg	Nickel mg/kg	Arsenic mg/kg	Cadmium mg/kg	Copper mg/kg	Zinc mg/kg	Silver mg/kg	Barium mg/kg	Selenium mg/kg	Aluminum mg/kg	Iron mg/kg	Manganese mg/kg	Potassium mg/kg	Sodium mg/kg	Thallium mg/kg	Antimony mg/kg	Beryllium mg/kg	Cobalt mg/kg	Calcium mg/kg	Cyanide mg/kg	Magnesium mg/kg	Vanadium mg/kg	TOC mg/kg	Gravel %	Sand %	Coarse Sand %	Medium Sand %	Fine Sand %	Silt %	Clay %	Fines %
KKMB-SD-004	SD-004-0.5/1.5	0.5	1.5	5/13/2015	**0.045** J	**0.055** J	**0.098** J	**28.2**	**0.151** J	**15.1**	**19.2**	**7.71**	**0.467** J	**22.5**	**82.3**		**105**	7.04 U	**13600**		**819**			**1.46** J	7.04 U	**0.627**	**7.73**		**0.32** J		**30.1**	**32000**								
KKMB-SD-004	SD-004-1.5/2.3	1.5	2.3	5/13/2015	**0.0041** J	**0.0056** J	**0.0076** J	**22**	0.312 U	**7.97**	**17.4**	**5.6** J	**0.339** J	**18.7**	**61.8**		**102**	**3.11** J	**12800**		**824**			**1.56** J	6.37 U	**0.571**	**7.03**		0.82 U		**28.4**	**26000**								
KKMB-SD-004E	SD-004B-0.5/1.5	0.5	2.3	5/13/2015	**0.048** J	**0.015** J	**0.012** J	**22.5**	**0.0212** J	**8.61**	**17.5**	**7.1**	**0.337** J	**18.9**	**64.5**		**109**	**3.61** J	**13100**		**824**			**1.52** J	6.8 U	**0.578**	**6.97**		0.83 U		**28.5**	**30000**								
KKMB-SD-004E	SD-004B-1.5/3.8	1.5	3.8	5/13/2015	**0.0027** J	**0.0037** J	**0.0045** J	**21**	**0.0185** J	**6.82**	**16.8**	**5.95** J	**0.382** J	**18.4**	**63.5**		**113**	**4.83** J	**12300**		**847**			**1.47** J	6.7 U	**0.58**	**6.99**		0.85 U		**27.5**	**32100**								
KKMB-SD-005	SD-005-0.0/0.5	0	0.5	5/13/2015	**0.85**	**0.71**	**0.95** J	**262**	**0.71**	**270**	**33.1**	**26.6**	**15.4**	**119**	**830**		**126**	**6.68** J	**13000**		**488**			12.3 U	8.22 U	**0.88**	**8.87**		**2**		**35.9**	**46100**								
KKMB-SD-005	SD-005-0.5/1.5	0.5	1.5	5/13/2015	**1.3**	**0.87**	**1.7**	**309**	**1.4**	**586**	**36.6**	**34.1**	**13**	**127**	**787**		**176**	**10.8**	**15800**		**437**			12.5 U	**0.871** J	**1.17**	**9.09**		**1.1**		**37**	**71000**								
KKMB-SD-005	SD-005-1.5/2.5	1.5	2.5	5/13/2015	**0.75** J	**0.65** J	**0.99**	**220**	**0.773**	**162**	**26.5**	**20.5**	**6.67**	**78.8**	**511**		**120**	**5.63** J	**13800**		**396**			11.7 U	7.77 U	**0.812**	**7.17**		**1.2**		**32**	**43100**								
KKMB-SD-005	SD-005-2.5/3.5	2.5	3.5	5/13/2015	**0.23** J	**0.45** J	**0.88** J	**68**	**0.186** J	**58.4**	**11.5**	**8.46**	**2.39**	**29.6**	**202**		**50.3**	**3.35** J	**5710**		**317**			9.07 U	6.05 U	**0.365**	**3.83**		**0.47** J		**17.6**	**25900**								
KKMB-SD-005	SD-005-3.5/4.5	3.5	4.5	5/13/2015	**0.041** J	**0.042** J	**0.069**	**19.9**	**0.0416** J	**16.1**	**4.77**	4.9 U	**0.599** J	**9.35**	**55.4**		**19.4**	**1.26** J	**2980**		**185**			7.35 U	4.9 U	**0.164** J	**1.88**		**0.32** J		**10.3**	**619**								
KKMB-SD-005	SD-005-4.5/5.5	4.5	5.5	5/13/2015	**0.038** J	**0.032** J	**0.042**	**9.54**	**0.0203** J	**4.84**	**5.42**	5.53 U	**0.194** J	**6.54**	**38.2**		**29.9**	**1.31** J	**3410**		**235**			8.3 U	5.53 U	**0.192** J	**2.36**		0.66 U		**11.3**	**19700**								
KKMB-SD-005	SD-005-5.5/6.4	5.5	6.4	5/13/2015	**0.082** J	**0.056** J	**0.05** J	**55.5** J	**0.0701** J	**20.2** J	**12.9**	**5.8** J	**0.567** J	**21.5**	**118** J		**73**	**4.06** J	**5900**		**354**			14.1 U	9.4 U	**0.344** J	**4.62**		1.2 U		**18**	**62800**								
KKMB-SD-006	SD-006-0.0/0.5	0	0.5	5/11/2015	**2** J	**2.6** J	**2.6** J	**165**	**0.611**	**207**	**27.5**	**17.7**	**8.24**	**91.9**	**507**		**118**	7.94 U	**13600**		**439**			11.9 U	7.94 U	**0.734**	**7.49**		**1.2**		**33**	**48700**								
KKMB-SD-006	SD-006-0.5/1.5	0.5	1.5	5/11/2015	**0.41** J	**0.49** J	**0.61** J	**49.1**	**0.0743** J	**40.5**	**14.3**	**5.55** J	**1.25** J	**28.3**	**122**		**81.2**	7.62 U	**8840**		**424**			11.4 U	7.62 U	**0.474**	**5.28**		**0.37** J		**24.3**	**36400**								
KKMB-SD-006	SD-006-1.5/2.5	1.5	2.5	5/11/2015	**1**	**0.91**	**1.8**	**187**	**1.11**	**167**	**25.5**	**24.4**	**13.2**	**91.6**	**676**		**106**	7.38 U	**10800**		**399**			11.1 U	7.38 U	**0.596**	**5.94**		**2**		**28.2**	**54200**								
KKMB-SD-006	SD-006-2.5/3.5	2.5	3.5	5/11/2015	**0.34**	**0.44**	**0.62**	**323**	**0.927**	**363**	**63.6**	**21.9**	**9.43**	**118**	**643**		**154**	7.41 U	**18900**		**519**			11.1 U	7.41 U	**0.958**	**10.1**		**1.3**		**47.8**	**56100**								
KKMB-SD-006	SD-006-3.5/4.5	3.5	4.5	5/11/2015	**0.4**	**0.43**	**0.86**	**176**	**0.527**	**187**	**26.4**	**15.6**	**7.01**	**87.5**	**493**		**112**	6.61 U	**14100**		**491**			9.91 U	6.61 U	**0.689**	**7.54**		**1.9**		**36.3**	**50900**								
KKMB-SD-006	SD-006-4.5/5.5	4.5	5.5	5/11/2015	**0.46**	**0.85**	**1.4**	**276**	**1.35**	**409**	**36**	**36.4**	**12.1**	**139**	**1030**		**203**	**5.57** J	**16400**		**541**			10.6 U	7.08 U	**0.948**	**9.54**		**1.9**		**41.7**	**66700**								
KKMB-SD-006	SD-006-5.5/6.5	5.5	6.5	5/11/2015	**0.42**	**0.62**	**0.82** J	**82**	**0.387**	**326**	**18.1**	**23.2**	**2.48**	**52.6**	**276**		**108**	**7.95**	**9330**		**394**			**1.71** J	5.87 U	**0.787**	**6.65**		**0.63** J		**25.2**	**66200**								
KKMB-SD-006	SD-006-6.5/7.5	6.5	7.5	5/11/2015	**0.14** J	**0.33** J	**0.15** J	**15.6**	**0.0755** J	**38.4** J	**9.58** J	**4.19** J	**0.349** J	**20.7** J	**57.8**		**110**	5.23 U	**6640**		**332**			7.84 U	5.23 U	**0.508**	**4.02**		**0.73**		**18.5**	**30100**								
KKMB-SD-006	SD-006-7.5/8.0	7.5	8	5/11/2015	**0.038**	**0.089**	**0.029** J	**15.3**	**0.0989** J	**10**	**14.3**	**5.85**	**0.225** J	**17.3**	**35.9**		**78.1**	**1.29** J	**15000**		**249**			**1.89** J	4.93 U	**0.606**	**3.83**		**0.4** J		**19.2**	**13300**								
KKMB-SD-007	SD-007-0.0/0.5	0	0.5	5/11/2015	**0.12**	**0.19**	**0.34**	**154**	**0.334** J	**176**	**26**	**9.42**	**4.17**	**84.3**	**402**		**116**	9.07 U	**15700**		**504**			13.6 U	9.07 U	**0.746**	**7.62**		**1.1** J		**35.6**	**55300**								
KKMB-SD-007	SD-007-0.5/1.5	0.5	1.5	5/11/2015	**0.087**	**0.13**	**0.26**	**181**	**0.502**	**183**	**29.5**	**11**	**4.71**	**108**	**493**		**141**	9.26 U	**18700**		**647**			13.9 U	9.26 U	**0.829**	**9.35**		**1** J		**40.2**	**57400**								
KKMB-SD-007	SD-007-1.5/2.5	1.5	2.5	5/11/2015	**0.16**	**0.32**	**0.48**	**233**	**0.595**	**297**	**36.9**	**13.2**	**6.54**	**103**	**506**		**138**	7.95 U	**16900**		**538**			11.9 U	**4.62** J	**0.85**	**8.84**		**1.7**		**40.2**	**49900**								
KKMB-SD-007	SD-007-2.5/3.5	2.5	3.5	5/11/2015	**0.3**	**0.4**	**0.63**	**207**	**0.486**	**246**	**30.3**	**11.7**	**5.39**	**98.7**	**498**		**124**	7.04 U	**15400**		**554**			10.6 U	7.04 U	**0.746**	**8.36**		**1.5**		**38.4**	**39000**								
KKMB-SD-007	SD-007-3.5/4.0	3.5	4	5/11/2015	**0.37**	**0.79**	**1**	**198**	**0.443**	**249**	**25**	**13**	**5.43**	**183**	**441**		**234**	5.88 U	**12600**		**436**			8.82 U	**3.75** J	**0.628**	**7.84**		**1.2**		**33.3**	**36500**								
KKMB-SD-008	SD-008-0.0/0.5	0	0.5	5/11/2015	**0.14**	**0.51**	**0.9**	**383**	**1.11**	**503**	**66.9**	**21.9**	**11.5**	**150**	**788**		**184**	8.83 U	**21400**		**620**			13.2 U	8.83 U	**1.02**	**11.9**		**0.79** J		**58.9**	**54100**								
KKMB-SD-008	SD-008-0.5/1.5	0.5	1.5	5/11/2015	**0.13**	**0.33**	**0.54** J	**298**	**0.913**	**451**	**44.7**	**21.5**	**9.75**	**126**	**667**		**169**	7.5 U	**21500**		**508**			11.2 U	7.5 U	**1.04**	**10.8**		**1.5**		**44.7**	**59200**								
KKMB-SD-008	SD-008-1.5/2.5	1.5	2.5	5/11/2015	**0.34**	**0.33**	**0.52**	**182**	**0.689**	**187**	**28.1**	**13.9**	**6.05**	**76.2**	**405**		**129**	**4.67** J	**15100**		**439**			10.8 U	7.19 U	**0.977**	**9.7**		**1.6**		**35.9**	**53400**								
KKMB-SD-008	SD-008-2.5/3.5	2.5	3.5	5/11/2015	**1.5** J	**1.2** J	**1.4** J	**216**	**0.794**	**82.4**	**21**	**15.2**	**1.21** J	**56.5**	**265**		**102**	7.03 U	**11100**		**426**			10.6 U	7.03 U	**0.691**	**7.03**		**1.1**		**29.8**	**52600**								
KKMB-SD-008	SD-008-3.5/4.6	3.5	4.6	5/11/2015	**0.41**	**0.37**	**0.72** J	**351**	**1.02**	**91.8**	**20.1**	**11.7**	**1.38** J	**56.4**	**295**		**92.6**	7.11 U	**10800**		**335**			10.7 U	7.11 U	**0.589**	**5.6**		**2.2**		**26.6**	**44900**								
KKMB-SD-008	SD-008-4.6/5.3	4.6	5.3	5/11/2015	**0.002**	**0.0031**	**0.0046**	**14**	0.215 U	**11.1**	**13.4**	**4.28** J	**0.211** J	**15.7**	**56.5**		**35.9**	4.6 U	**7870**		**351**			6.9 U	4.6 U	**0.36**	**5.15**		0.56 U		**23**	**3600**								
KKMB-SD-009	SD-009-0.0/0.5	0	0.5	5/13/2015	**0.51**	**1.1**	**1.4**	**427**	**0.979**	**528**	**49.9**	**20.2**	**13.2**	**143**	**893**		**179**	**6.16** J	**16800**		**621**			13.7 U	**1.37** J	**0.966**	**10.8**		**1.1** J		**47.4**	**65500**								
KKMB-SD-009	SD-009-0.5/1.5	0.5	1.5	5/13/2015	**0.82**	**0.94**	**1.4**	**315**	**1.03**	**388**	**43.1**	**21.9**	**10.5**	**130**	**708**		**167**	**6.59** J	**17900**		**540**			12.7 U	**0.787** J	**1.16**	**10.5**		**1.6**		**40.7**	**49700**								
KKMB-SD-009	SD-009-1.5/2.5	1.5	2.5	5/13/2015	**1.1** J	**1.2** J	**2.2** J	**296**	**0.968**	**480**	**41.6**	**26**	**12.1**	**142**	**817**		**167**	**7.72** J	**17500**		**431**			12.3 U	**2.76** J	**1.37**	**9.69**		**1.3**		**40.4**	**68600**								
KKMB-SD-009	SD-009-2.5/3.5	2.5	3.5	5/13/2015	**1.5**	**0.86**	**0.94**	**316**	**1.35**	**532**	**45.6**	**29.3**	**12.6**	**147**	**865**		**181**	**7.54** J	**20100**		**514**			13.9 U	**2.43** J	**1.54**	**10.7**		**1.7**		**44.9**	**72400**								
KKMB-SD-009	SD-009-3.5/4.5	3.5	4.5	5/13/2015	**1.5**	**1.3**	**1.5**	**312**	**1.28**	**582**	**46.1**	**29.5**	**11.6**	**147**	**933**		**186**	**6.55** J	**18500**		**475**			13 U	**2.29** J	**1.25**	**10.3**		**1.4**		**45.5**	**56700**								
KKMB-SD-009	SD-009-4.5/5.5	4.5	5.5	5/13/2015	**1.6**	**1.1**	**1.8**	**415**	**2.17**	**465**	**51.9**	**54.6**	**21.7**	**220**	**1390**		**215**	**10.8**	**17900**		**443**			12.9 U	**2.05** J	**1.41**	**10.2**		**2.1**		**42.1**	**87600**								
KKMB-SD-009	SD-009-5.5/6.5	5.5	6.5	5/13/2015	**0.79** J	**0.7** J	**1.2** J	**188**	**0.864**	**178**	**25.1**	**24.6**	**9.44**	**92.2**	**629**		**108**	**5.2** J	**10800**		**354**			9.68 U	6.45 U	**0.708**	**6.51**		**1.6**		**26.4**	**65300**								
KKMB-SD-009	SD-009-6.5/7.5	6.5	7.5	5/13/2015	**1.1**	**0.83**	**1.1**	**246**	**1.23**	**220**	**26.7**	**25**	**8.96**	**98**	**586**		**134**	**6.34** J	**12300**		**442**			11 U	**0.638** J	**0.777**	**7.25**		0.96 U		**30.1**	**58900**								
KKMB-SD-009	SD-009-7.5/8.5	7.5	8.5	5/13/2015	**0.13** J	**0.13** J	**0.21** J	**18.5**	**0.0314** J	**12.6**	**7.75**	**2.07** J	**0.445** J	**13.1**	**73.7**		**21.4**	**1.96** J	**3760**		**257**			7.22 U	4.82 U	**0.231** J	**3.1**		0.63 U		**13.1**	**6850**								
KKMB-SD-009	SD-009-8.5/9.5	8.5	9.5	5/13/2015	**0.0066** J	**0.0069** J	**0.0098** J	**7.13**	0.233 U	**5.82**	**6.76**	4.72 U	**0.215** J	**10.3**	**53.2**		**15.8**	**1.54** J	**3340**		**226**			7.08 U	4.72 U	**0.169** J	**2.81**		0.6 U		**12.7**	**2160**								
KKMB-SD-009	SD-009-9.5/10.5	9.5	10.5	5/13/2015	0.002 U	**0.001** J	**0.0022** J	**6.04**	0.225 U	**4.84**	**6.09**	**1.31** J	**0.179** J	**9.48**	**49.8**		**17.1**	**1.74** J	**3360**		**216**			7.03 U	4.69 U	**0.17** J	**2.58**		0.58 U		**11.2**	**2190**								
KKMB-SD-009	SD-009-10.5/11.8	10.5	11.8	5/13/2015	**0.0008** J	**0.001** J	**0.0022** J	**6.32**	0.225 U	**4.91**	**6.65**	**2.99** J	**0.163** J	**9.55**	**49.9**		**21.1**	**1.69** J	**3350**		**230**			7.05 U	4.7 U	**0.167** J	**3.39**		0.58 U		**13**	**1740**								
KKMB-SD-010	SD-010-0.0/0.5	0	0.5	5/14/2015	**0.16**	**0.15**	**0.28**	**169**	**0.536**	**209**	**26.2**	**11.5**	**4.42**	**97.4**	**442**		**141**	8.61 U	**12100**		**588**			**2.25** J	**1.09** J	**0.751**	**8.32**		**0.74** J		**35.4**	**48800**								
KKMB-SD-010	SD-010-0.5/1.5	0.5	1.5	5/14/2015	**0.2**	**0.19**	**0.39**	**351**	**0.619**	**280**	**37.7**	**15.6**	**6.82**	**124**	**654**		**159**	**7.38** J	**14900**		**634**			**1.95** J	**1.65** J	**0.911**	**10.5**		**0.83** J		**51.3**	**47800**								
KKMB-SD-010	SD-010-1.5/2.5	1.5	2.5	5/14/2015	**0.2**	**0.2**	**0.37**	**412**	**0.78**	**297**	**34.9**	**18.3**	**7.34**	**123**	**646**		**155**	7.76 U	**13400**		**628**			**1.72** J	**1.5** J	**1.43**	**9.9**		**0.9** J		**44.8**	**46800**								
KKMB-SD-010	SD-010-2.5/3.5	2.5	3.5	5/14/2015	**0.16**	**0.16**	**0.29**	**433**	**0.757**	**344**	**37.9**	**16.3**	**7.34**	**122**	**670**		**162**	7.64 U	**15900**		**634**			**2.01** J	**0.862** J	**1.13**	**10.2**		**0.41** J		**50.9**	**72300**								
KKMB-SD-010	SD-010-3.5/5.0	3.5	5	5/14/2015	**0.9**	**0.98**	**1.7**	**386**	**0.862**	**400**	**39.1**	**20.4**	**10.1**	**123** J	**729**		**158**	**5.07** J	**15000**		**614**			**2.4** J	**1.47** J	**1.1** J	**10**		**0.7** J		**47**	**60200**								
KKMB-SD-011	SD-011-0.0/0.5	0	0.5	5/13/2015	**1.3** J	**1.2** J	**1.9** J	**146**	**0.499**	**152**	**26.3**	**14.5**	**4.02**	**92.5**	**429**		**122**	**4.67** J	**14200**		**581**			**2.02** J	8.79 U	**0.796**	**8.35**		**0.67** J		**30.3**	**42900**								
KKMB-SD-011	SD-011-0.5/1.5	0.5	1.5	5/13/2015	**1.2** J	**1.1** J	**1.7** J	**158**	**0.495**	**164**	**26.3**	**13.8**	**4.24**	**89.5**	**432**		**116**	**5.16** J	**13700**		**559**			**2.04** J	7.96 U	**0.739**	**8.33**		**0.47** J		**32.2**	**45800**								
KKMB-SD-011	SD-011-1.5/2.5	1.5	2.5	5/13/2015	**1.8** J	**1.4** J	**2** J	**370**	**0.577**	**295**	**34.4**	**18.2**	**6.82**	**119**	**641**		**210**	**4.16** J	**17600**		**612**			**1.68** J	8.03 U	**0.864**	**9.63**		**1.1**		**40.6**	**44400**								
KKMB-SD-011	SD-011-2.5/3.1	2.5	3.1	5/13/2015	**1.4** J	**1.1** J	**2** J	**255**	**0.591**	**228**	**32.2**	**16.1**	**5.81**	**93.7**	**537**		**137**	**4.81** J	**16700**		**630**			**1.93** J	7.95 U	**0.868**	**8.78**		**0.79** J		**39.1**	**68700**								
KKMB-SD-011	SD-011-3.1/4.0	3.1	4	5/13/2015	**0.02**	**0.026**	**0.029** J	**29.2**	**0.022** J	**11.6**	**21.7**	**6.44** J	**0.426** J	**20.4**	**69.4**		**97.9**	**3.59** J	**15700**		**733**			**1.82** J	6.47 U	**0.693**	**8.12**		0.77 U		**31.9**	**16800**								
KKMB-SD-012	SD-012-0.0/0.5	0	0.5	5/14/2015	**0.27**	**0.4**	**0.57**	**122**	**0.411** J	**159**	**28.8**	**11.8**	**3.49**	**83.6**	**445**		**117**	8.5 U	**15800**		**572**			12.7 U	8.5 U	**0.722**	**9.29**		**0.6** J		**30.5**	**51000**								
KKMB-SD-012	SD-012-0.5/1.5	0.5	1.5	5/14/2015	**0.18**	**0.3**	**0.53**	**144**	**0.472**	**175**	**27.6**	**12.3**	**4.01**	**89.4**	**469**		**113**	7.97 U	**12900**		**533**			12 U	7.97 U	**0.622**	**8.45**		0.99 U		**27.4**	**53200**								
KKMB-SD-012	SD-012-1.5/2.5	1.5	2.5	5/14/2015	**0.38**	**0.45**	**0.83**	**186**	**1.06**	**211**	**30.7**	**13.7**	**4.99**	**99.7**	**538**		**121**	7.26 U	**15100**		**551**			10.9 U	7.26 U	**0.704**	**9.07**		0.91 U		**31.4**	**40500**								
KKMB-SD-012	SD-012-2.5/3.5	2.5	3.5	5/14/2015	**0.54**	**0.64**	**1.1**	**211**	**0.516**	**220**	**34.3**	**15.9**	**5.09**	**108**	**594**		**132**	7.37 U	**17000**		**555**			11.1 U	7.37 U	**0.727**	**9.62**		**0.41** J		**34.1**	**42800**								
KKMB-SD-012	SD-012-3.5/4.5	3.5	4.5	5/14/2015	**0.61**	**0.69**	**0.96**	**347**	**1.33**	**383**	**45.1**	**27**	**11.6**	**129**	**757**		**180**	8.18 U	**18000**		**522**			12.3 U	**3.93** J	**0.951**	**10.6**		**0.55** J		**36.6**	**47800**								
KKMB-SD-012	SD-012-4.5/5.5	4.5	5.5	5/14/2015	**5.2**	**2.6**	**3.6**	**287**	**1.47**	**393**	**42.9**	**27.8**	**11.7**	**131** J	**802**		**170**	7.8 U	**17900**		**461**			11.7 U	**6.43** J	**0.983**	**10.4**		**1.3**		**36.6**	**94300**								
KKMB-SD-012	SD-012-5.5/6.5	5.5	6.5	5/14/2015	**4.2**	**1.5**	**2.4**	**316**	**1.5**	**372**	**41.7**	**30.1**	**11.6**	**129**	**806**		**161**	7.81 U	**15600**		**438**			11.7 U	**6.87** J	**0.915**	**9.48**		**0.73** J		**33.4**	**35100**								
KKMB-SD-012	SD-012-6.5/7.5	6.5	7.5	5/14/2015	**5.3**	**4.2**	**7**	**370**	**2.28**	**351**	**39.3**	**47.9**	**34.9**	**153**	**1450**		**164**	**7.04** J	**15300**		**401**			**2.73** J	**4.72** J	**0.863**	**8.72**		**2.9**		**32.1**	**121000**								
KKMB-SD-012	SD-012-7.5/8.5	7.5	8.5	5/14/2015	**8.2**	**6**	**8.5**	**303**	**2.09**	**376**	**41.4**	**46.8**	**18.3**	**135**	**1060**		**182**	**7.14** J	**17300**		**435**			**3.47** J	**5.24** J	**0.902**	**9.49**		**2**		**33.7**	**95500**								
KKMB-SD-012	SD-012-8.5/9.5	8.5	9.5	5/14/2015	**3.8**	**2.6**	**3.9**	**354**	**2.11**	**296**	**35.8**	**38.6**	**9.21**	**111**	**750**		**179**	7.26 U	**18900**		**435**			**2.9** J	**4.36** J	**0.935**	**9.43**		**1.9**		**35.7**	**81800**								
KKMB-SD-012	SD-012-9.5/10.5	9.5	10.5	5/14/2015	**4.2**	**2.2**	**3.5**	**387**	**2.41**	**347**	**29.4**	**37.4**	**7.05**	**110**	**720**		**169**	**6.63** J	**15400**		**409**			11.1 U	**3.28** J	**0.887**	**8.02**		**1.5**		**29.8**	**91600**								
KKMB-SD-012	SD-012-10.5/12.2	10.5	12.2	5/14/2015	**1.5**	**0.94**	**1.7**	**152**	**0.519**	**64.6**	**21.1**	**9.62**	**0.825** J	**31.4**	**221**		**82**	6.31 U	**12600**		**510**			9.46 U	6.31 U	**0.572**	**7.39**		**0.61** J		**23.1**	**26700**								
KKMB-SD-013	SD-013-0.0/0.5	0	0.5	5/14/2015	**0.5**	**0.57**	**0.88** J	**214**	**0.565**	**205**	**29.4**	**15.3**	**5.36**	**112**	**524**		**144**	**7.04** J	**15900**		**657**			**2.1** J	8.22 U	**0.876**	**9.08**		**0.77** J		**35.6**	**54700**								
KKMB-SD-013	SD-013-0.5/1.5	0.5	1.5	5/14/2015	**0.42**	**0.51**	**0.75** J	**232**	**0.687**	**217**	**30.7**	**15.8**	**5.4**	**118**	**544**		**141**	**5.3** J	**15300**		**629**			**1.74** J	7.81 U	**0.834**	**9.35**		**0.54** J		**36.1**	**54800**								
KKMB-SD-013	SD-013-1.5/2.5	1.5	2.5	5/14/2015	**0.29**	**0.41**	**0.53** J	**225**	**0.465**	**224**	**31.5**	**15.2**	**5.58**	**121**	**565**		**142**	**4.83** J	**15600**		**617**			**1.92** J	7.23 U	**0.867**	**9.3**		**0.73** J		**35.6**	**52000**								
KKMB-SD-013	SD-013-2.5/3.5	2.5	3.5	5/14/2015	**0.42** J	**0.4** J	**0.64** J	**222**	**0.535**	**224**	**30**	**15**	**5.52**	**115**	**551**		**143**	**6.21** J	**14900**		**607**			**1.83** J	7.49 U	**0.887**	**9.1**		**0.69** J		**34**	**59100**								
KKMB-SD-013	SD-013-3.5/4.5	3.5	4.5	5/14/2015	**0.29** J	**0.35** J	**0.61** J	**316**	**0.472** J	**274**	**34.2**	**15.9**	**6.47**	**129**	**651**		**154**	**5.47** J	**17700**		**639**			**1.76** J	7.5 UJ	**0.881**	**9.97**		**0.71** J		**40.4**	**56500**								
KKMB-SD-013	SD-013-4.5/5.5	4.5	5.5	5/14/2015	**0.32**	**0.59**	**0.67**	**325**	**0.535**	**262**	**31.8**	**14.6**	**5.89**	**121**	**606**		**139**	**6.48** J	**14900**		**569**			**1.86** J	7.48 U	**0.794**	**9.34**		**0.67** J		**37.1**	**77900**								
KKMB-SD-013	SD-013-5.5/6.5	5.5	6.5	5/14/2015	**0.6** J	**0.73** J	**0.95** J	**398**	**0.654**	**312**	**36.6**	**19.3**	**7.38**	**130**	**682**		**156**	**5.86** J	**17000**		**597**			**2.47** J	**0.871** J	**0.871**	**10.1**		**0.65** J		**41.1**	**63000**								
KKMB-SD-013	SD-013-6.5/7.5	6.5	7.5	5/14/2015	**3.7**	**2.2**	**2.1** J	**334**	**1.19**	**336**	**39.7**	**55.6**	**37.8**	**227**	**1630**		**193**	**10.4**	**12600**		**368**			**3.34** J	**2.13** J	**0.992**	**7.87**		**1.6**		**30.7**	**117000**								
KKMB-SD-013	SD-013-7.5/8.5	7.5	8.5	5/14/2015	**12** J	**6.5** J	**6** J	**309**	**1.77**	**352**	**40.8**	**38.8**	**16.5**	**169**	**1000**		**178**	**7.59**	**16300**		**442**			**2.73** J	**3.06** J	**1.05**	**9.45**		**4.1**		**38.7**	**106000**								
KKMB-SD-013	SD-013-8.5/9.5	8.5	9.5	5/14/2015	**27**	**12**	**16**	**388**	**2.25**	**404**	**35.6**	**49.3**	**29.9**	**191**	**1430**		**165**	**9.62**	**11600**		**409**			**2.81** J	**3.12** J	**0.817**	**7.99**		**2.6**		**28.2**	**127000**								
KKMB-SD-013	SD-013-9.5/10.5	9.5	10.5	5/14/2015	**19**	**16**	**16**	**278**	**1.66**	**297**	**27.5**	**34.1**	**10.1**	**126**	**646**		**171**	**8.06**	**11400**		**432**			**2.11** J	7.14 U	**0.788**	**7.53**		**1.4**		**28.5**	**134000**								
KKMB-SD-013	SD-013-10.5/11.5	10.5	11.5	5/14/2015	**14**	**10**	**11**	**380**	**1.86**	**300**	**32.8**	**33.1**	**9.34**	**126**	**713**		**182**	**7.92**	**13700**		**462**			**2.39** J	**2.94** J	**0.848**	**8.48**		**2.1**		**32.8**	**101000**								
KKMB-SD-013	SD-013-11.5/13.0	11.5	13	5/14/2015	**15**	**22**	**17**	**312**	**1.74**	**340**	**37.5**	**39.8**	**16.9**	**148**	**936**		**184**	**9.48**	**13200**		**448**			**2.83** J	**2.84** J	**0.819**	**8.48**		**1.7**		**31.4**	**171000**								
KK-SDA11	KK-SDA11-0.0/0.3	0	0.3	12/12/2012	**0.473**	**8.08**	**14.8**	**76**	**0.2** J	**170** J	**26**	**6.6**	**2.5**			**0.48**	**110**	**1.3**	**10000**	**18000**	**400**	**2100**	**330** J	**0.26**	**0.16** J

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

					PCB										PAH																
Analyte Group																															
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8																
WI CBSQG PEC					3										68.4																
WI CBSQG PEC					5										114																
TSCA					50																										
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KK-SDA11	KK-SDA11-2.0/4.0	2	4	12/12/2012		0.037 U	0.037 U				0.037 U	0.037 U		0.037 U	**0.19**	**0.000441 J**	**0.00272**	**0.000664 J**	**0.00488**	**0.0129 J**	**0.0144 J**	**0.0153 J**	**0.0116 J**	**0.0112 J**				**0.0416 J**	**0.00207**	**0.0109 J**
KK-SDA11	KK-SDA11-4.0/6.0	4	6	12/12/2012		0.035 U	0.035 U				0.035 U	0.035 U		0.035 U	**0.0088**	0.00114 U	**0.000299 J**	**0.00026 J**	**0.000236 J**	0.00114 U	0.00114 U	**0.000524 J**	**0.00102 J**	**0.00114**				**0.000443 J**	0.00114 U	0.00114 U
KK-SDA11	KK-SDA11-6.0/8.0	6	8	12/12/2012		0.034 U	0.034 U				0.034 U	0.034 U		0.034 U	**0.0089**	0.00112 U	**0.000213 J**	0.00112 U	0.00112 U	0.00112 U	0.00112 U	**0.000366 J**	**0.00086 J**	**0.00121**				0.00112 U	0.00112 U	0.00112 U
KK-SDA11	KK-SDA11-8.0/9.5	8	9.5	12/12/2012		0.037 U	0.037 U				0.037 U	0.037 U		0.037 U	**0.021**	0.00114 U	**0.000308 J**	**0.000229 J**	**0.000498 J**	**0.00154**	**0.00156**	**0.00182**	**0.00215**	**0.00209**				**0.00373**	0.00114 U	**0.00105 J**
KK-SDA12	KK-SDA12-0.0/0.3	0	0.3	12/13/2012		**0.039 J**	0.065 U					0.065 U		**0.46**	**90.3**	**0.263**	**0.463**	**0.23**	**1.25**	**6.56**	**8.53**	**11**	**7.12**	**6.76**				**18.1**	**0.706**	**7.05**
KK-SDA12	KK-SDA12-0.3/2.5	0.3	2.5	12/13/2012		**0.89 J**	2 UJ				2 UJ	2 UJ		**13 J**	**234**	**0.827**	**2.68**	**0.695**	**6.27**	**17.6**	**15.2**	**18.6**	**11.1**	**8.7**				**57.2 D**	**3.84**	**9.59**
KK-SDA12	KK-SDA12-2.5/4.3	2.5	4.3	12/13/2012		0.038 U	0.038 U				**0.066**	0.038 U		0.038 U	**5**	**0.0174**	**0.0901**	**0.014**	**0.122**	**0.357**	**0.307**	**0.389**	**0.285**	**0.234**				**1.11**	**0.121**	**0.248**
KK-SDA13	KK-SDA13-0.0/0.3	0	0.3	12/12/2012		**0.034 J**	0.058 U					0.058 U		0.058 U	**87.8**	**0.273**	**0.663**	**0.394**	**2.03**	**6.9**	**8.66**	**9.2**	**6.3**	**5.94**				**16.8**	**1.01**	**6.42**
KK-SDA13	KK-SDA13-0.3/2.0	0.3	2	12/12/2012		**0.066**	0.054 U					0.054 U		0.054 U	**78.2**	**0.293**	**0.768**	**0.417**	**1.69**	**5.76**	**8.07**	**7.95**	**6.04**	**5.58**				**14.6**	**0.886**	**6.05**
KK-SDA13	KK-SDA13-2.0/4.0	2	4	12/12/2012		**0.21 J**	0.28 UJ				**1.3 J**	0.28 UJ		0.28 UJ	**118**	**1.19**	**1.74**	**0.717**	**3.03**	**8.77**	**9.52**	**10**	**7.08**	**6.5**				**22**	**2.49**	**7.09**
KK-SDA13	KK-SDA13-4.0/6.0	4	6	12/12/2012		**0.16**	**0.45**				0.1 U	0.1 U		0.1 U	**236**	**4.93**	**7.3**	**1.58**	**8**	**14.2**	**13.8**	**14**	**10**	**8.68**				**33.8**	**9.09**	**8.58**
KK-SDA13	KK-SDA13-6.0/8.0	6	8	12/12/2012		**0.047 J**	**0.14 J**				0.046 UJ	0.046 UJ		0.046 UJ	**73.8**	**1.26**	**1.6**	**0.451**	**2.84**	**4.68**	**4.82**	**4.96**	**3.6**	**2.77**				**11.3 D**	**2.47**	**3.01**
KK-SDA13	KK-SDA13-8.0/10.0	8	10	12/12/2012		0.042 U	0.042 U				0.042 U	0.042 U		0.042 U	**10.6**	**0.194**	**0.276**	**0.0667**	**0.445**	**0.601**	**0.57**	**0.556**	**0.43**	**0.339**				**1.7**	**0.396**	**0.362**
KK-SDA13A	KK-SDA13A-10.0/12.0	10	12	11/8/2013											**0.05**	**0.000807 J**	**0.00094 J**	**0.000668 J**	**0.00099 J**	**0.0013 J**	**0.00157**	**0.00405**	**0.00525**	**0.00992 J**				**0.00624**	**0.00284**	**0.00223 J**
KK-SDA13A	KK-SDA13A-14.0/16.0	14	16	11/8/2013											**0.024**	**0.00039 J**	**0.000503 J**	**0.000297 J**	**0.000476 J**	**0.000722 J**	**0.000715 J**	**0.00227**	**0.00313**	**0.0044 J**				**0.00277**	**0.00138 J**	**0.00108 J**
KK-SDA14	KK-SDA14-0.0/0.3	0	0.3	12/13/2012		**0.058 J**	0.065 UJ					0.065 UJ		**0.5 J**	**109**	**0.249**	**0.659**	**0.233**	**1.98**	**8.28**	**9.91**	**12.6**	**7.66**	**7.27**				**22.5**	**0.99**	**7.55**
KK-SDA14	KK-SDA14-0.3/2.0	0.3	2	12/13/2012		**0.05 J**	0.1 U					0.1 U		**0.6**	**104**	**0.206**	**0.745**	**0.208**	**1.84**	**7.76**	**9.19**	**11.1**	**7.18**	**6.64**				**21.9**	**1.05**	**7.16**
KK-SDA14	KK-SDA14-2.0/4.0	2	4	12/13/2012		**0.064 J**	0.1 U				0.1 U	0.1 U		**0.6**	**79.6**	**0.206**	**0.607**	**0.193**	**1.56**	**6.02**	**7.22**	**8.33**	**5.39**	**5.02**				**16.9**	**0.866**	**5.32**
KK-SDA14	KK-SDA14-4.0/6.0	4	6	12/13/2012		**0.29 J**	0.52 UJ				**3.2 J**	0.52 UJ		0.52 UJ	**155**	**0.524**	**1.42**	**0.446**	**3.13**	**11.8**	**13.6**	**15.3**	**10.3**	**9.47**				**33.6 D**	**2.09**	**10.1**
KK-SDA14	KK-SDA14-6.0/8.0	6	8	12/13/2012		**0.09 J**	0.21 U				0.21 U	0.21 U		**0.81**	**282**	**3.52**	**2.54**	**1.74**	**8.47**	**22.2**	**20.6**	**22.2**	**14.7**	**12.1**				**44.2**	**6.82**	**13.2**
KK-SDA14	KK-SDA14-8.0/10.0	8	10	12/13/2012		**0.043 J**	0.052 U				0.052 U	0.052 U		**0.27**	**268**	**4.38**	**2.82**	**1.86**	**8.47**	**18**	**16.2**	**18**	**12**	**9.28**				**37.1**	**6.95**	**9.99**
KK-SDA14	KK-SDA14-10.0/12.0	10	12	12/13/2012		**0.034 J**	0.051 U				0.051 U	0.051 U		**0.13**	**206**	**3.76**	**3.21**	**1.31**	**6.75**	**14.6**	**13**	**13.5**	**9.36**	**7.2**				**29**	**6.16**	**7.94**
KK-SDA14	KK-SDA14-12.0/14.0	12	14	12/13/2012		0.049 U	0.049 U				0.049 U	0.049 U		0.049 U	**180**	**3.11**	**1.76**	**1.48**	**5.24**	**13**	**11.7**	**11.4**	**8.21**	**6.22**				**24.2**	**4.09**	**6.83**
KK-SDA15	KK-SDA15-0.0/0.3	0	0.3	12/12/2012		**0.045 J**	0.077 U					0.077 U		0.077 U	**74.8**	**0.7**	**0.876**	**0.48**	**1.74**	**5.08**	**7.12**	**8.16**	**5.84**	**5.37**				**13.1**	**1.21**	**5.54**
KK-SDA15	KK-SDA15-0.3/2.0	0.3	2	12/12/2012		**0.12 J**	0.54 UJ					0.54 UJ		0.54 UJ	**--**	**7.14**	**7.81**	**2.23**	**11.1**	**16.4**	**15.7**	**16**	**10.8**	**8.8**				**35.3**	**9.19**	**9.53**
KK-SDA15	KK-SDA15-2.0/4.0	2	4	12/12/2012		**0.21 J**	0.99 UJ				**2.7 J**	0.99 UJ		0.99 UJ	**213**	**12.9**	**9.12**	**1.71**	**9.14**	**12.7**	**10.9**	**10.9**	**7.77**	**5.44**				**26.2**	**9.18**	**6.16**
KK-SDA15	KK-SDA15-4.0/6.0	4	6	12/12/2012		**0.12 J**	0.2 UJ				**0.83 J**	0.2 UJ		0.2 UJ	**263**	**8.76**	**4.7**	**2.8**	**10**	**15**	**14.2**	**13.3**	**10.3**	**7.26**				**30.8**	**7.13**	**7.83**
KK-SDA15	KK-SDA15-6.0/8.0	6	8	12/12/2012		**0.17 J**	0.2 U				**0.93**	0.2 U		0.2 U	**385**	**18.4**	**12.4**	**2.33**	**12.9**	**18.4**	**18.7**	**19.5**	**13.7**	**10.2**				**46.3 D**	**12.7**	**11.3**
KK-SDA15	KK-SDA15-8.0/10.0	8	10	12/12/2012		0.052 UJ	0.052 UJ				**0.074 J**	0.052 UJ		0.052 UJ	**2700**	**139**	**121**	**9.87**	**59.9**	**91.1**	**77.4**	**69.2**	**49.5**	**36.9**				**191**	**71.1**	**43.7**
KK-SDA15	KK-SDA15-10.0/11.5	10	11.5	12/12/2012		0.047 UJ	0.047 UJ				0.047 UJ	0.047 UJ		0.047 UJ	**350**	**13.3**	**12.7**	**0.961**	**8.35**	**9.65**	**7.82**	**7.14**	**4.92**	**3.66**				**22.7**	**10.2**	**4.06**
KK-SDA16A	KK-SDA16A-0.0/0.3	0	0.3	12/17/2012		**0.13**	0.13 U					0.13 U		0.13 U	**87.9**	**0.513**	**0.699**	**0.462**	**1.85**	**6.55**	**8.84**	**9.47**	**6.77**	**6.39**				**16.2**	**1.08**	**6.82**
KK-SDA16A	KK-SDA16A-0.3/2.0	0.3	2	12/17/2012		**0.4**	0.31 U					0.31 U		0.31 U	**115**	**0.694**	**1.01**	**0.62**	**2.72**	**8.46**	**10.7**	**12.8**	**8**	**7.62**				**21.7**	**1.6**	**8.37**
KK-SDA16A	KK-SDA16A-2.0/4.0	2	4	12/17/2012		**0.79 J**	0.62 UJ				**4.3 J**	0.62 UJ		0.62 UJ	**220**	**1.59**	**2.42**	**1.18**	**6.09**	**15.7**	**19.5**	**23**	**14.4**	**13.7**				**42.5**	**3.78**	**14.8**
KK-SDA16A	KK-SDA16A-4.0/6.0	4	6	12/17/2012		**0.49 J**	0.6 UJ				**3.8 J**	0.6 UJ		0.6 UJ	**96**	**1.06**	**1.2**	**0.644**	**3.01**	**7.12**	**8.01**	**8.56**	**6.12**	**5.18**				**17.2**	**2.11**	**5.77**
KK-SDA16A	KK-SDA16A-6.0/8.0	6	8	12/17/2012		**0.082 J**	0.12 U				**0.61**	0.12 U		0.12 U	**20.9**	**0.141**	**0.18**	**0.286**	**0.86**	**2.03**	**1.9**	**1.97**	**1.31**	**1.06**				**3.77**	**0.351**	**1.22**
KK-SDA17A	KK-SDA17A-0.0/0.3	0	0.3	12/18/2012		0.069 U	0.069 U					0.069 U		0.069 U	**92.4**	**0.693**	**0.854**	**0.632**	**2.03**	**6.7**	**8.95**	**10.3**	**6.81**	**6.63**				**16.3**	**1.39**	**7.26**
KK-SDA17A	KK-SDA17A-0.3/2.0	0.3	2	12/18/2012		**0.042 J**	0.068 U					0.068 U		**0.39**	**80.1**	**0.798**	**1.1**	**0.657**	**1.73**	**6.12**	**7.58**	**9.05**	**5.96**	**5.57**				**13.8**	**1.27**	**6.1**
KK-SDA17A	KK-SDA17A-2.0/4.0	2	4	12/18/2012		0.25 U	0.25 U				**0.48**	0.25 U		0.25 U	**318**	**4.1**	**16**	**3.77**	**16.1**	**22.9**	**20.3**	**18.4**	**13.4**	**10.6**				**53.3 D**	**18.8**	**11.1**
KK-SDA17A	KK-SDA17A-4.0/6.0	4	6	12/18/2012		0.053 U	0.053 U				0.053 U	0.053 U		**0.067**	**15.4**	**0.329**	**1.04**	**0.127**	**0.694**	**0.946**	**0.814**	**0.827**	**0.59**	**0.495**				**2.33**	**1.13**	**0.561**
KK-SDA17A	KK-SDA17A-6.0/8.0	6	8	12/18/2012		0.055 U	0.055 U				0.055 U	0.055 U		0.055 U	**10.7**	**0.17**	**0.659**	**0.116**	**0.484**	**0.753**	**0.602**	**0.648**	**0.429**	**0.342**				**1.6**	**0.805**	**0.389**
KK-SDA18A	KK-SDA18A-0.0/0.3	0	0.3	12/18/2012		**0.054 J**	0.073 UJ					0.073 UJ		0.073 UJ	**56.2**	**1.39**	**0.431**	**0.501**	**1.39 J**	**3.75**	**5.48**	**6.41**	**4.58**	**4.28**				**8.42**	**0.797**	**4.56**
KK-SDA18A	KK-SDA18A-0.3/2.0	0.3	2	12/18/2012		0.053 U	0.053 U					0.053 U		0.053 U	**0.64**	**0.0716**	**0.00672**	**0.00425**	**0.0146**	**0.0304**	**0.0366**	**0.0494**	**0.0374**	**0.037**				**0.0848**	**0.0194**	**0.0342**
KK-SDA18A	KK-SDA18A-2.0/4.0	2	4	12/18/2012		0.047 U	0.047 U				**0.026 J**	0.047 U		0.047 U	**0.6**	**0.0144**	**0.00634**	**0.00442**	**0.0124**	**0.035**	**0.0453**	**0.0634**	**0.0477**	**0.0541**				**0.102**	**0.012**	**0.0442**
KK-SDA19	KK-SDA19-0.0/0.3	0	0.3	12/13/2012		**0.022 J**	0.079 U					0.079 U		**0.47**	**127**	**0.193**	**0.944**	**0.381 J**	**2.55 J**	**9.53**	**10.7**	**12.4**	**8.38**	**7.64**				**27.8**	**1.48 J**	**8.23**
KK-SDA19	KK-SDA19-0.3/2.0	0.3	2	12/13/2012		**0.046 J**	0.12 U					0.12 U		**0.57**	**164**	**0.564**	**2.16**	**0.241**	**4.08**	**11.7**	**13.1**	**15**	**9.46**	**8.91**				**35.3 D**	**3.01**	**9.61**
KK-SDA19	KK-SDA19-2.0/4.0	2	4	12/13/2012		**0.022 J**	0.045 U				0.045 U	0.045 U		**0.21**	**19.2**	**0.0614**	**0.323**	**0.0426**	**0.365**	**1.3**	**1.34**	**1.63**	**1.1**	**1.02**				**4.24**	**0.396**	**1.09**
KK-SDA19	KK-SDA19-4.0/6.0	4	6	12/13/2012		0.044 U	0.044 U				0.044 U	0.044 U		0.044 U	**0.51**	**0.00155 J**	**0.00672**	**0.00241**	**0.00842**	**0.0351**	**0.0323**	**0.0496**	**0.0372**	**0.0336**				**0.111**	**0.0092**	**0.0327**
KK-SDA19	KK-SDA19-6.0/8.0	6	8	12/13/2012		0.041 U	0.041 U				0.041 U	0.041 U		0.041 U	**0.43**	**0.000986 J**	**0.00386**	**0.00197 J**	**0.00743**	**0.032**	**0.0279**	**0.041**	**0.0303**	**0.0272**				**0.0956**	**0.00672**	**0.0268**
KK-SDA19	KK-SDA19-8.0/10.0	8	10	12/13/2012		0.042 U	0.042 U				0.042 U	0.042 U		0.042 U	**0.22**	**0.00105 J**	**0.00249**	**0.000556 J**	**0.00353**	**0.0136**	**0.0118**	**0.0216**	**0.0163**	**0.0163**				**0.0469**	**0.00488**	**0.0136**
KK-SDA20	KK-SDA20-0.0/0.3	0	0.3	11/5/2013											**73.7**	**0.325**	**0.558**	**0.528**	**1.61 J**	**6.46**	**8.05**	**8.98**	**6.24**	**6.02**				**11.3 J**	**0.805**	**6.64**
KK-SDA20	KK-SDA20-0.3/2.0	0.3	2	11/5/2013											**91.1**	**0.471**	**0.848**	**0.657**	**2.14 J**	**8.26**	**9.86**	**10.6**	**7.48**	**7.13**				**14.2 J**	**1.14**	**7.92**
KK-SDA20	KK-SDA20-2.0/4.0	2	4	11/5/2013											**120**	**0.564**	**1.27**	**0.66**	**2.52 J**	**9.48**	**13.7**	**15.1**	**10.3**	**9.5**				**17.6 J**	**1.72**	**10.7**
KK-SDA20	KK-SDA20-4.0/6.0	4	6	11/5/2013											**107**	**1.52**	**1.85**	**0.897**	**2.89 J**	**8.91**	**9.82**	**10.4**	**7.38**	**6.98**				**16.2 J**	**2.19**	**7.7**
KK-SDA20	KK-SDA20-8.0/10.0	8	10	11/5/2013											**132**	**4.55**	**3.32**	**1.17**	**4.88 J**	**8.71**	**7.77**	**6.86**	**5.28**	**4.6**				**13.7 J**	**3.67**	**5.16**
KK-SDA20	KK-SDA20-10.0/12.0	10	12	11/5/2013											**0.3**	**0.00586**	**0.0077**	**0.00348**	**0.0116 J**	**0.0224**	**0.018**	**0.0214**	**0.017**	**0.0167**				**0.0393 J**	**0.0133**	**0.0141**
KK-SDA20	KK-SDA20-12.0/14.0	12	14	11/5/2013											**0.13**	**0.0034**	**0.00278**	**0.00261**	**0.00289 J**	**0.00658**	**0.00598**	**0.00853**	**0.00815**	**0.00842**				**0.0163 J**	**0.00472**	**0.00557**
KK-SDA21	KK-SDA21-0.0/0.3	0	0.3	11/6/2013											**114**	**0.836**	**0.996**	**0.559**	**2.8**	**7.44**	**8.36**	**9.78**	**6.94**	**6.28**				**26.2**	**1.96**	**6.74**
KK-SDA21	KK-SDA21-0.3/2.0	0.3	2	11/6/2013											**108**	**0.49**	**0.676**	**0.494**	**2.27**	**7.5**	**8.76**	**10.3**	**7.06**	**6.39**				**22.6 D**	**1.05**	**6.99**
KK-SDA21	KK-SDA21-2.0/4.0	2	4	11/6/2013											**169**	**1.2**	**2.34**	**0.941**	**4.09 J**	**13.8**	**20**	**16**	**14.6**	**12.6**				**24.1 J**	**3.42**	**14.6**
KK-SDA21	KK-SDA21-4.0/6.0	4	6	11/6/2013											**284**	**3.35**	**3.63**	**2.99 J**	**33.4 J**	**26.1 J**	**23.2 J**	**22.3**	**15.6**	**13.2**				**40.1 DJ**	**7.46 J**	**15.7**
KK-SDA21	KK-SDA21-6.0/8.0	6	8	11/6/2013											**127**	**1.94**	**1.97**	**1.22**	**3.41 J**	**11.1**	**10.9**	**12**	**8.39**	**6.9**				**18.5 J**	**3.42**	**7.94**
KK-SDA21	KK-SDA21-8.0/10.0	8	10	11/6/2013											**1.3**	**0.0247**	**0.0364**	**0.00932**	**0.035 J**	**0.0895**	**0.0831**	**0.097**	**0.0749**	**0.066**				**0.203 J**	**0.0495**	**0.0719**
KK-SDA21	KK-SDA21-12.0/14.0	12	14	11/6/2013											**0.67**	**0.00844**	**0.00895**	**0.00586**	**0.0158 J**	**0.0541**	**0.0471**	**0.0604**	**0.0457**	**0.0384**				**0.116 J**	**0.0167**	**0.0409**
KK-SDA21	KK-SDA21-16.0/18.0	16	18	11/6/2013											**0.03**	**0.000903 J**	**0.000691 J**	**0.000656 J**	**0.000866 J**	**0.00137 J**	**0.00127 J**	**0.00276**	**0.00407**	**0.00426**				**0.00281 J**	**0.00193**	**0.00118 J**
KK-SDA22	KK-SDA22-14.0/16.0	14	16	11/6/2013											**0.069**	**0.00133 J**	**0.00106 J**	**0.000534 J**	**0.00175**	**0.00253**	**0.00234**	**0.00444**	**0.00482**	**0.00771**				**0.00962**	**0.00339**	**0.00248**
KK-SDA22	KK-SDA22-18.0/20.0	18	20	11/6/2013											**0.19**	**0.00572**	**0.00598**	**0.000646 J**	**0.00447**	**0.00233**	**0.00179**	**0.00408**	**0.00462**	**0.00752**				**0.0148 J**	**0.0114 J**	**0.00204**
KK-SDA23	KK-SDA23-0.0/0.3	0	0.3	11/8/2013											**92**	**0.327**	**0.37**	**0.383**	**1.27**	**6.38**	**9.19**	**11**	**7.85**	**7.62**				**18.1**	**0.56**	**7.85**
KK-SDA23	KK-SDA23-0.3/2.0	0.3	2	11/8/2013											**128**	**0.566**	**0.72**	**0.591**	**2.45**	**8.82**	**11.7**	**14**	**9.62**	**9.14**				**26.7**	**1.12**	**9.59**
KK-SDA23	KK-SDA23-4.0/6.0	4	6	11/8/2013											**174**	**4.61**	**3.38**	**0.704**	**6.31**	**12.3**	**11.6**	**12.5**	**9.26**	**7.7**				**33.9**	**4.74**	**8.26**
KK-SDA23	KK-SDA23-6.0/8.0	6	8	11/8/2013											**101**	**5.52**	**3.13**	**0.938**	**4.96 J**	**8.22**	**6.34**	**6.65**	**4.4**	**3.47**				**13 J**	**4.13**	**3.98**
KK-SDA23	KK-SDA23-8.0/10.0	8	10	11/8/2013											**132**	**4.56**	**3.07**	**0.7**	**5.99 J**	**8.68**	**6.79 J**	**7.4**	**5.26**	**4.06 J**				**24.4**	**4.76 J**	**4.4 J**
KK-SDA23	KK-SDA23-12.0/14.0	12	14	11/8/2013											**107**	**6.13**	**3.25**	**0.549**	**5**	**6.66**	**4.99**	**5.07**	**3.76**	**2.77 J**				**17.6**	**4.01**	**2.99 J**
KK-SDA23	KK-SDA23-14.0/16.0	14	16	11/8/2013											**66.4**	**3.32**	**2.5**	**0.543**	**3.19 J**	**5.94**	**4.17**	**4.16**	**2.86**	**2.3**				**8.05 J**	**2.65**	**2.73**
KK-SDA23	KK-SDA23-16.0/18.0	16	18	11/8/2013											**0.49**	**0.0279**	**0.0281**	**0.00163 J**	**0.0126**	**0.0109**	**0.00904**	**0.0122**	**0.0118**	**0.0166 J**				**0.0445**	**0.0235**	**0.00766 J**
KK-SDA23	KK-SDA23-20.0/21.0	20	21	11/8/2013											**0.096**	**0.00221**	**0.00184**	**0.000803 J**	**0.00261**	**0.00423**	**0.00375**	**0.00754**	**0.00769**	**0.0115 J**				**0.0153**	**0.0047**	**0.00433 J**
KK-SDA24	KK-SDA24-8.0/10.0	8	10	11/8/2013											**181**	**2.55**	**1.99**	**1.33**	**5.92**	**12.9**	**11.7**	**13.6**	**9.56**	**7.46**				**42.2 D**	**4.27**	**8.6 J**
KK-SDA24	KK-SDA24-10.0/11.3	10	11.3	11/8/2013											**147**	**3.14**	**1.28**	**1.16**	**4.6**	**8.96**	**8.86**	**10.3**	**7.52**	**5.99**				**30.1 D**	**4.52**	**6.73**
KK-SDA25	KK-SDA25-0.0/0.3	0	0.3	11/5/2013											**94.1**	**0.306**	**0.546**	**0.521**	**7.39**	**7.86**	**8.62**	**10.6**	**7.14**	**6.7**				**15.6**	**0.866**	**7.38**
KK-SDA25	KK-SDA25-0.3/2.0	0.3	2	11/5/2013											**91.4**	**0.436**	**0.8**	**0.554**	**1.81**	**7.08**	**8.96**	**10.2**	**6.98**	**6.74**				**16.6**	**1.15**	**7.25**
KK-SDA25	KK-SDA25-2.0/4.0	2	4	11/5/2013											**90.4**	**0.854**	**1.34**	**0.736**	**2.28 J**	**7.89**	**8.26**	**10.1**	**6.71**	**6.19**				**14.4 J**	**1.89**	**6.98**

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																				Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																											
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
KK-SDA11	KK-SDA11-2.0/4.0	2	4	12/12/2012	**0.000632** J	**0.0244** J	**0.0338** J	**6.8**	**0.0093** J	**3.3** J	**8**	**1.4**	**0.23**		**28**	**0.025** J			**0.26** J	**2400**	**4800**	**250**	**510**	**190** J	**0.054** J	0.21 U	**0.2**		**89000**	0.56 U	**37000**	**12**									
KK-SDA11	KK-SDA11-4.0/6.0	4	6	12/12/2012	0.00114 U	0.0012 UB	**0.000876** J	**6.9**	**0.0084** J	**2.8** J	**8**	**1.3**	**0.18**		**30**	0.1 U			**0.27** J	**2000**	**4300**	**230**	**430**	**160** J	**0.043** J	0.2 U	**0.12**		**91000**	0.55 U	**39000**	**12**									
KK-SDA11	KK-SDA11-6.0/8.0	6	8	12/12/2012	0.00112 U	0.00117 UB	**0.000673** J	**6.4**	**0.0077** J	**3** J	**6.4**	**0.64**	**0.2**		**25**	**0.021** J			**0.36** J	**2500**	**5500**	**230**	**630**	**190** J	**0.054** J	0.21 U	**0.1**		**94000**	0.54 U	**47000**	**11**									
KK-SDA11	KK-SDA11-8.0/9.5	8	9.5	12/12/2012	**0.000365** J	0.00244 UB	**0.00352**	**5.5**	**0.0092** J	**2.2** J	**5.9**	**0.8**	**0.17**		**21**	0.1 U			**0.3** J	**2200**	**5100**	**230**	**430**	**170** J	**0.048** J	0.21 U	**0.088** J		**77000**	0.54 U	**33000**	**9.1**									
KK-SDA12	KK-SDA12-0.0/0.3	0	0.3	12/13/2012	**0.435**	**7.52**	**14.3**	**76**	**0.21**	**160** J	**26**	**6.4**	**2.3**		**420**	**0.57**	**100** J		**1.4**	**9300**	**18000**	**420**	**2000**	**330** J	**0.26**	0.38 UBJ	**0.65**	**7.5**	**70000**	**2.1**		**29**		**4.7**	**17.4**	**1**	**1.3**	**15.1**	**48**	**29.9**	
KK-SDA12	KK-SDA12-0.3/2.5	0.3	2.5	12/13/2012	**2**	**34.4** D	**45** D	**110**	**0.39**	**380** J	**29**	**9.9**	**4.9**		**410**	**1.6**	**120** J		**1.6**	**10000**	**18000**	**450**	**2200**	**310** J	**0.33**	0.29 UBJ	**0.77**	**8.6**	**68000**	**0.96**	**34000** J	**30**		**36.3**	**12.7**	**1**	**3.4**	**8.3**	**21.7**	**29.3**	
KK-SDA12	KK-SDA12-2.5/4.3	2.5	4.3	12/13/2012	**0.0301**	**0.867**	**0.83**	**20**	**0.022** J	**9.4** J	**19**	**3.8**	**0.52**		**74**	**0.061** J			**0.88**	**8400**	**12000**	**350**	**2700**	**310** J	**0.22**	0.23 UJ	**0.62**		**84000**	**0.13** J	**39000** J	**25**									
KK-SDA13	KK-SDA13-0.0/0.3	0	0.3	12/12/2012	**0.829**	**8.39**	**14**	**52**	**0.16** J	**370** J	**22**	**5.1**	**2.2**		**450**	**0.36**	**84**		**1.1**	**7200**	**14000**	**370**	**1500**	**280** J	**0.21**	0.34 UBJ	**0.47**	**6.4**	**72000**	**0.85** J		**21**									
KK-SDA13	KK-SDA13-0.3/2.0	0.3	2	12/12/2012	**1.15**	**6.87**	**12.1**	**110**	**0.19** J	**250** J	**28**	**6.1**	**2.9**		**500**	**0.67**	**100**		**1.3**	**10000**	**19000**	**420**	**2200**	**280** J	**0.26**	0.29 UBJ	**0.55**	**7.1**	**77000**	0.83 U		**27**		**3.8**	**21.7**	**2.4**	**4.6**	**14.7**	**45.4**	**29.1**	
KK-SDA13	KK-SDA13-2.0/4.0	2	4	12/12/2012	**10.5**	**9.53**	**17.6**	**260**	**0.64** J	**440** J	**32**	**15**	**6.9**		**660**	**1.3**			**2.7**	**13000**	**24000**	**600**	**2500**	**290** J	**0.51**	0.3 UBJ	**0.85**		**67000**	**1.5**	**30000**	**33**									
KK-SDA13	KK-SDA13-4.0/6.0	4	6	12/12/2012	**48.1**	**26.8**	**26.8**	**190**	**0.77** J	**300** J	**25**	**15**	**5**		**480**	**0.89**			**2.4**	**9500**	**20000**	**320**	**1700**	**250** J	**0.58**	**0.61** J	**0.85**		**55000**	0.79 U	**23000**	**28**									
KK-SDA13	KK-SDA13-6.0/8.0	6	8	12/12/2012	**13.1** D	**8.28**	**8.62**	**62**	**0.18** J	**100** J	**18**	**6.3**	**1.9**		**190**	**0.37**			**1.5**	**8400**	**15000**	**520**	**1800**	**260** J	**0.28**	0.26 UBJ	**0.46**		**100000**	**1.2**	**37000**	**20**									
KK-SDA13	KK-SDA13-8.0/10.0	8	10	12/12/2012	**2.03**	**1.35**	**1.32**	**20**	**0.051** J	**17** J	**15**	**2.5**	**0.55**		**58**	**0.074** J			**0.98**	**7500**	**13000**	**540**	**1700**	**220** J	**0.17**	0.24 UBJ	**0.36**		**100000**	**0.28** J	**42000**	**19**									
KK-SDA13A	KK-SDA13A-10.0/12.0	10	12	11/8/2013	**0.00185**	**0.00522**	**0.00648**	**28**	**0.015** J	**9.7**			**0.17**		**62**						**18000**																				
KK-SDA13A	KK-SDA13A-14.0/16.0	14	16	11/8/2013	**0.00112** J	**0.00194**	**0.00307**	**16**	**0.012** J	**7.2**			**0.14**		**48**						**12000**												**0**	**4**	**0**	**0**	**4**	**69**	**27**	
KK-SDA14	KK-SDA14-0.0/0.3	0	0.3	12/13/2012	**0.807**	**10.4**	**17.7**	**68**	**0.2**	**160** J	**24**	**5.5**	**2.3**		**420**	**0.48**	**97** J		**1.2**	**7400**	**15000**	**380**	**1600**	**340** J	**0.27**	0.35 UBJ	**0.52**	**6.8**	**70000**	**0.6** J		**26**		**1.1**	**23.1**	**0.1**	**1.4**	**21.6**	**57.2**	**18.6**	
KK-SDA14	KK-SDA14-0.3/2.0	0.3	2	12/13/2012	**0.383**	**11**	**17.2**	**70**	**0.21**	**190** J	**26**	**5.6**	**2.6**		**460**	**0.69**	**96** J		**1.3**	**8400**	**16000**	**400**	**1800**	**340** J	**0.25**	**0.32** J	**0.52**	**7.2**	**74000**	**1.3**		**27**									
KK-SDA14	KK-SDA14-2.0/4.0	2	4	12/13/2012	**0.335**	**8.47**	**13.2**	**81**	**0.25**	**230** J	**28**	**5.8**	**2.7**		**520**	**0.86**			**1.3**	**9200**	**17000**	**410**	**1900**	**370** J	**0.25**	0.3 UBJ	**0.59**		**80000**	**1.3**	**38000** J	**28**									
KK-SDA14	KK-SDA14-4.0/6.0	4	6	12/13/2012	**2.39**	**16.6**	**24.2**	**170**	**0.44**	**460** J	**33**	**8.8**	**5.7**		**690**	**1.3**			**1.8**	**11000**	**19000**	**740**	**2200**	**600** J	**0.33**	0.33 UBJ	**0.8**		**65000**	**2.6**	**33000** J	**34**		**1.3**	**10**	**0.4**	**1.2**	**8.4**	**53**	**35.7**	
KK-SDA14	KK-SDA14-6.0/8.0	6	8	12/13/2012	**48.8** D	**25.8**	**34.8**	**170**	**0.92**	**370** J	**22**	**17**	**7.4**		**590**	**0.85**			**3.5**	**9100**	**18000**	**320**	**1800**	**990**	**0.77**	**1** J	**0.78**		**48000**	**2.4**	**22000** J	**24**									
KK-SDA14	KK-SDA14-8.0/10.0	8	10	12/13/2012	**69.1** D	**24.4**	**29.3**	**170**	**1**	**290** J	**21**	**22**	**6.2**		**530**	**0.74**			**4.7**	**7700**	**15000**	**280**	**1500**	**2300**	**0.98**	**0.42** J	**0.75**		**41000**	**6.2**	**17000** J	**23**									
KK-SDA14	KK-SDA14-10.0/12.0	10	12	12/13/2012	**46.5** D	**21.7**	**21.9**	**160**	**1.9**	**230** J	**19**	**19**	**2.8**		**430**	**1.2**			**4.4**	**6400**	**14000**	**290**	**1200**	**5500**	**0.88**	**0.34** J	**0.74**		**40000**	**2.2**	**16000** J	**23**									
KK-SDA14	KK-SDA14-12.0/14.0	12	14	12/13/2012	**49** D	**15**	**18.4**	**240**	**1.3**	**210** J	**18**	**19**	**2.5**		**400**	**0.63**			**4.3**	**6000**	**14000**	**290**	**1200**	**10000**	**0.91**	**0.41** J	**0.66**		**54000**	**2.5**	**19000** J	**23**									
KK-SDA15	KK-SDA15-0.0/0.3	0	0.3	12/12/2012	**2.12** J	**6.69**	**10.8**	**93**	**0.21** J	**180** J	**28**	**6.8**	**2.9**		**430**	**0.61**	**110**		**1.4**	**13000**	**23000**	**500**	**3000**	**360** J	**0.34**	**0.13** J	**0.76**	**8.7**	**72000**	**0.94** J		**30**		**6.7**	**16.7**	**2.7**	**2.3**	**11.7**	**47.2**	**29.4**	
KK-SDA15	KK-SDA15-0.3/2.0	0.3	2	12/12/2012	**26.7**	**31.8**	**27.4**	**84**	**0.34** J	**270** J	**17**	**8.2**	**3.3**		**330**	**0.72**	**85**		**1.7**	**7000**	**13000**	**270**	**1400**	**210** J	**0.23**	0.28 UBJ	**0.61**	**5.3**	**33000**	**1.3**		**17**									
KK-SDA15	KK-SDA15-2.0/4.0	2	4	12/12/2012	**43.7**	**27.3**	**20.3**	**67**	**0.23** J	**160** J	**14**	**5.5**	**2.2**		**180**	**0.57**			**1.4**	**6900**	**13000**	**190**	**1300**	**160** J	**0.18**	0.27 UBJ	**0.59**		**32000**	**0.51** J	**13000**	**14**									
KK-SDA15	KK-SDA15-4.0/6.0	4	6	12/12/2012	**80.1**	**26.8**	**24**	**98**	**0.3** J	**200** J	**23**	**9.2**	**3.7**		**270**	**0.95**			**2.1**	**11000**	**18000**	**290**	**2000**	**190** J	**0.32**	**0.29** J	**0.81**		**42000**	**0.62** J	**18000**	**24**									
KK-SDA15	KK-SDA15-6.0/8.0	6	8	12/12/2012	**116** D	**44.2** D	**28.4**	**120**	**0.58** J	**240** J	**26**	**13**	**5.4**		**400**	**0.87**			**2.8**	**9800**	**19000**	**310**	**1800**	**180** J	**0.47**	0.26 UBJ	**0.88**		**46000**	**1.2**	**20000**	**25**									
KK-SDA15	KK-SDA15-8.0/10.0	8	10	12/12/2012	**1380** D	**210**	**148**	**1200**	**3.2** J	**300** J	**28**	**15**	**2.7**		**630**	**1.1**			**2.4**	**7300**	**26000**	**330**	**1200**	**210** J	**0.79**	**0.85** J	**0.82**		**59000**	**2.4**	**17000**	**32**		**5.7**	**19.4**	**2.3**	**3.7**	**13.4**	**36.5**	**38.4**	
KK-SDA15	KK-SDA15-10.0/11.5	10	11.5	12/12/2012	**200** D	**28.2**	**16.8**	**270**	**0.78** J	**59** J	**21**	**5.8**	**1.1**		**210**	**0.21**			**1.7**	**10000**	**19000**	**560**	**2400**	**260** J	**0.34**	0.25 UBJ	**0.55**		**82000**	**1.2**	**27000**	**28**		**6.2**	**7.9**	**0.6**	**1.3**	**6**	**48.9**	**37**	
KK-SDA16A	KK-SDA16A-0.0/0.3	0	0.3	12/17/2012	**1.52**	**7.2**	**13.5**	**85**	**0.23**	**150** J	**25**	**6.7**	**2.7**		**410**	**0.53**	**100** J		1.8 UJ	**12000**	**22000**	**460**	**2400**	**360** J	**0.32**	**0.13** J	**0.58**	**7.7**	**87000**	**0.82** J		**28**		**2.6**	**10.2**	**0.5**	**1.1**	**8.6**	**48.2**	**39**	
KK-SDA16A	KK-SDA16A-0.3/2.0	0.3	2	12/17/2012	**1.81**	**10.8**	**17.9**	**180**	**0.34**	**320** J	**33**	**8.8**	**5.1**		**640**	**1.2**	**120** J		1.9 UJ	**13000**	**23000**	**510**	**2500**	**350** J	**0.31**	**0.12** J	**0.83**	**9.2**	**73000**	**1.4**		**35**									
KK-SDA16A	KK-SDA16A-2.0/4.0	2	4	12/17/2012	**4.47**	**23.8**	**32.8**	**540**	**0.52**	**640** J	**34**	**12**	**10**		**900**	**1.9**			**2.4**	**14000**	**25000**	**580**	**2600**	**350** J	**0.36**	**0.39** J	**1.1**		**65000**	**2**	**30000**	**42**									
KK-SDA16A	KK-SDA16A-4.0/6.0	4	6	12/17/2012	**4.89**	**11.1**	**14**	**200**	**0.49**	**410** J	**36**	**12**	**6.5**		**500**	**1.7**			**2.3**	**11000**	**22000**	**630**	**2200**	**330** J	**0.37**	**0.26** J	**1.1**		**95000**	**0.71** J	**33000**	**37**									
KK-SDA16A	KK-SDA16A-6.0/8.0	6	8	12/17/2012	**0.512**	**2.22**	**3.06**	**23**	**0.028** J	**18** J	**16**	**2.3**	**0.71**		**72**	**0.092** J			1.4 UJ	**7600**	**16000**	**650**	**1300**	**280** J	**0.14** J	0.36 U	**0.47**		**130000**	**0.38** J	**33000**	**21**		**0**	**5.1**	**0**	**1**	**4.1**	**51.3**	**43.6**	
KK-SDA17A	KK-SDA17A-0.0/0.3	0	0.3	12/18/2012	**2.41**	**8.03**	**13.4**	**100** J	**0.26**	**190** J	**26**	**6.8**	**2.6** J		**390**	**1**	**110**		**0.85** J	**12000** J	**21000** J	**570** J	**2200**	**510** J	**0.26**	**0.16** J	**0.71**	**8.2** J	**4000** J	**0.93** J		**29**									
KK-SDA17A	KK-SDA17A-0.3/2.0	0.3	2	12/18/2012	**2.44**	**6.44**	**11.5**	**170** J	**0.34**	**250** J	**25** J	**8.7**	**3** J		**540**	**0.91**	**140**		**0.77** J	**14000** J	**24000** J	**460** J	**2900**	**730** J	**0.33**	**0.1** J	**0.76**	**7.7** J	**4000** J	**0.96** J		**37**									
KK-SDA17A	KK-SDA17A-2.0/4.0	2	4	12/18/2012	**5.76**	**62.1** D	**41.4** D	**91** J	**0.31**	**190** J	**24** J	**6**	**2.9** J		**280**	**0.82**			**0.77** J	**10000** J	**18000** J	**410** J	**1900**	**1000**	**0.23**	**0.086** J	**0.72**		**74000** J	**0.78** J	**28000** J	**25**		**5.7**	**19.4**	**2.3**	**3.7**	**13.4**	**36.5**	**38.4**	
KK-SDA17A	KK-SDA17A-4.0/6.0	4	6	12/18/2012	**0.654**	**2.94**	**1.91**	**23** J	**0.037**	**28** J	**13** J	**3.1**	**0.31** J		**74**	**0.085** J			**0.48** J	**8100** J	**14000** J	**430** J	**1800**	**970**	**0.18**	**0.023** J	**0.42**		**110000** J	**0.3** J	**38000** J	**21**		**6.2**	**7.9**	**0.6**	**1.3**	**6**	**48.9**	**37**	
KK-SDA17A	KK-SDA17A-6.0/8.0	6	8	12/18/2012	**0.263**	**2.13**	**1.27**	**23** J	**0.025** J	**26** J	**14** J	**2.7**	**0.24** J		**75**	**0.044** J			**0.53** J	**8600** J	**15000** J	**510** J	**1600**	**870**	**0.15** J	0.31 UJ	**0.5**		**110000** J	**0.21** J	**27000** J	**23**									
KK-SDA18A	KK-SDA18A-0.0/0.3	0	0.3	12/18/2012	**2.69**	**4.36**	**7.15**	**130** J	**0.33**	**150** J	**25** J	**7.6**	**2.5** J		**390**	**0.72**	**140**		**1.1**	**14000** J	**23000** J	**770** J	**2700**	**330** J	**0.37**	**0.12** J	**0.79**	**8.6** J	**1000** J	**1** J		**35**		**10.5**	**11.3**	**1.1**	**3.1**	**7.1**	**27.7**	**50.5**	
KK-SDA18A	KK-SDA18A-0.3/2.0	0.3	2	12/18/2012	**0.0609**	**0.0834**	**0.0731**	**19** J	**0.018** J	**7.9** J	**14** J	**2.2**	**0.19** J		**51**	**0.032** J	**100**		**0.35** J	**9900** J	**17000** J	**770** J	**2100**	**300** J	**0.17**	0.32 UJ	**0.53**	**6.2** J	**6000** J	**0.17** J		**21**									
KK-SDA18A	KK-SDA18A-2.0/4.0	2	4	12/18/2012	**0.0196**	**0.0547**	**0.0858**	**22** J	**0.015** J	**8.5** J	**20** J	**2.3**	**0.12** J		**48**	**0.043** J			**0.23** J	**11000** J	**16000** J	**590** J	**2600**	**270** J	**0.18**	0.26 UJ	**0.62**		**92000** J	**0.17** J	**30000** J	**25**		**0**	**1.4**	**0**	**0.2**	**1.2**	**27.3**	**71.3**	
KK-SDA19	KK-SDA19-0.0/0.3	0	0.3	12/13/2012	**0.204**	**14.9**	**21.2**	**46**	**0.18**	**110** J	**23**	**4.9**	**2.2**		**400**	**0.61**	**79** J		**1.4**	**9300**	**18000**	**310**	**1800**	**370** J	**0.22** J	0.51 UBJ	**0.51**	**5.9**	**81000**	**1.5**		**22**									
KK-SDA19	KK-SDA19-0.3/2.0	0.3	2	12/13/2012	**1.49**	**24**	**25.8**	**72**	**0.17**	**230**	**28**	**6.7**	**2.8**		**520**	**0.76**	**100**		**1.6**	**11000**	**19000**	**430**	**2300**	**360** J	**0.33**	**0.27** J	**0.63**	**8.4**	**82000**	**0.22** J		**28**									
KK-SDA19	KK-SDA19-2.0/4.0	2	4	12/13/2012	**0.118**	**2.94**	**3.26**	**20**	**0.045**	**36** J	**14**	**4.5**	**0.55**		**110**	**0.12**			**1.1**	**7800**	**22000**	**470**	**2100**	**430** J	**0.13**	**0.073** J	**0.62**		**89000**	**0.31** J	**35000** J	**23**									
KK-SDA19	KK-SDA19-4.0/6.0	4	6	12/13/2012	**0.00272**	**0.0634**	**0.0868**	**14**	**0.02** J	**6.8** J	**14**	**2.1**	**0.34**		**39**	**0.043** J			**0.89**	**8600**	**12000**	**480**	**2100**	**290** J	**0.15**	0.23 UJ	**0.35**		**100000**	**0.21** J	**43000** J	**20**		**0**	**12.7**	**0**	**0.8**	**11.9**	**56.4**	**30.9**	
KK-SDA19	KK-SDA19-6.0/8.0	6	8	12/13/2012	**0.00151** J	**0.0546**	**0.0754**	**15**	**0.02** J	**7.5** J	**15**	**2**	**0.36**		**42**	**0.048** J			**0.94**	**7800**	**11000**	**500**	**1900**	**320** J	**0.16**	0.24 UJ	**0.44**		**110000**	0.71 U	**47000** J	**21**									
KK-SDA19	KK-SDA19-8.0/10.0	8	10	12/13/2012	**0.00332**	**0.0316**	**0.0373**	**17**	**0.022** J	**7.8** J	**16**	**2.1**	**0.44**		**48**	**0.052** J			**1**	**10000**	**15000**	**550**	**2400**	**320** J	**0.17**	0.23 UJ	**0.48**		**110000**	**0.22** J	**43000** J	**23**									
KK-SDA20	KK-SDA20-0.0/0.3	0	0.3	11/5/2013	**1.06**	**5.8** J	**9.28** J	**58**	**0.18**	**130**			**1.7**		**320**						**18000**												**1.5**	**16.5**	**1.4**	**1.1**	**14**	**57.8**	**24.2**	
KK-SDA20	KK-SDA20-0.3/2.0	0.3	2	11/5/2013	**1.08**	**7.66** J	**11.7** J	**73**	**0.19**	**170**			**2.2**		**390**						**19000**																				
KK-SDA20	KK-SDA20-2.0/4.0	2	4	11/5/2013	**1.8**	**10.8** J	**13.9** J	**170**	**0.43** J	**390**			**4.3**		**580**						**19000** J																				
KK-SDA20	KK-SDA20-4.0/6.0	4	6	11/5/2013	**7.16**	**10.7** J	**12.9** J	**650**	**0.9**	**400**			**3.8**		**600**						**22000**												**6.3**	**15.2**	**1**	**1.6**	**12.6**	**48.5**	**30**	
KK-SDA20	KK-SDA20-8.0/10.0	8	10	11/5/2013	**37.5** D	**13.8** J	**11.2** J	**1400**	**3.1**	**330**			**2**		**600**						**31000**																				
KK-SDA20	KK-SDA20-10.0/12.0	10	12	11/5/2013	**0.0369**	**0.0388** J	**0.033** J	**20**	**0.02** J	**9.2**			**0.28**		**61**						**15000** J																				
KK-SDA20	KK-SDA20-12.0/14.0	12	14	11/5/2013	**0.0263**	**0.0139** J	**0.0142** J	**15**	**0.015** J	**8.2**			**0.18**		**54**						**16000**																				
KK-SDA21	KK-SDA21-0.0/0.3	0	0.3	11/6/2013	**1.66**	**12.5**	**21**	**70**	**0.18**	**150**			**1.9**		**410**						**17000**												**2.5**	**15.6**	**0.7**	**1.2**	**13.7**	**57.7**	**24.2**	
KK-SDA21	KK-SDA21-0.3/2.0	0.3	2	11/6/2013	**0.785**	**10.4**	**22**	**72**	**0.19**	**150**			**2**		**380**						**16000**																				
KK-SDA21	KK-SDA21-2.0/4.0	2	4	11/6/2013	**5.05**	**17.2** J	**18.6** J	**150**	**0.48** J	**580**			**5.7**		**660**						**20000** J																				
KK-SDA21	KK-SDA21-4.0/6.0	4	6	11/6/2013	**16.4**	**30.6** J	**29.6** J	**130**	**0.52**	**420**			**5.2**		**440**						**19000**												**0**	**11.6**	**0**	**2.6**	**9**	**43.4**	**45**	
KK-SDA21	KK-SDA21-6.0/8.0	6	8	11/6/2013	**11.2**	**13.5** J	**14.2** J	**110**	**0.35** J	**310**			**4.7**		**400**						**19000** J																				
KK-SDA21	KK-SDA21-8.0/10.0	8	10	11/6/2013	**0.0915**	**0.182** J	**0.157** J	**19**	**0.012** J	**9.7**			**0.24**		**55**						**16000**																				
KK-SDA21	KK-SDA21-12.0/14.0	12	14	11/6/2013	**0.0404**	**0.0761** J	**0.0934** J	**14**	0.028 U	**7.5**			**0.22**		**52**						**14000**																				
KK-SDA21	KK-SDA21-16.0/18.0	16	18	11/6/2013	**0.0011** J	**0.0027** J	**0.00388** J	**10**	0.025 U	**6.7**			**0.17**		**50**						**11000**																				
KK-SDA22	KK-SDA22-14.0/16.0	14	16	11/6/2013	**0.0118**	**0.00654**	**0.00896**	**19**	**0.0084** J	**7.1**			**0.11** J		**41**						**16000**												**0**	**3.5**	**0**	**0.5**	**3**	**31.9**	**64.6**	
KK-SDA22	KK-SDA22-18.0/20.0	18	20	11/6/2013	**0.0878** J	**0.0242** J	**0.0119**	**20**	**0.01** J	**7.7**			**0.14**		**47**						**18000**																				
KK-SDA23	KK-SDA23-0.0/0.3	0	0.3	11/8/2013	**0.504**	**5.28**	**15.3**	**130**	**0.27**	**270**			**4.3**		**890**						**25000**												**1.5**	**6.9**	**0.2**	**1.1**	**5.6**	**72**	**19.6**	
KK-SDA23	KK-SDA23-0.3/2.0	0.3	2	11/8/2013	**1.16**	**9.13**	**22.4**	**220**	**0.34**	**530**			**5.9**		**880**						**25000**																				
KK-SDA23	KK-SDA23-4.0/6.0	4	6	11/8/2013	**7.33**	**23.3**	**28.3**	**21000**	**1.5**	**1500**			**6.2**		**1500**						**30000**												**0**	**14.7**	**1.3**	**6.3**	**7.1**	**67**	**18.3**	
KK-SDA23	KK-SDA23-6.0/8.0	6	8	11/8/2013	**10.9**	**15** J	**10.7** J	**40000**	**2.5** J	**1200**			**6.6**		**1200**						**22000** J																				
KK-SDA23	KK-SDA23-8.0/10.0	8	10	11/8/2013	**8.99**	**22.3**	**20.4**	**28000**	**2.7**	**590**			**9.4**		**570**						**24000**																				
KK-SDA23	KK-SDA23-12.0/14.0	12	14	11/8/2013	**11.7**	**17.5**	**14.9**	**30000**	**2.1**	**440**			**12**		**530**						**22000**																				
KK-SDA23	KK-SDA23-14.0/16.0	14	16	11/8/2013	**7.61**	**9.78** J	**6.63** J	**11000**	**1.1** J	**240**			**2.8**		**260**						**19000** J																				
KK-SDA23	KK-SDA23-16.0/18.0	16	18	11/8/2013	**0.186**	**0.0646**	**0.0364**	**27**	**0.014** J	**9.1**			**0.16**		**57**						**20000**																				
KK-SDA23	KK-SDA23-20.0/21.0	20	21	11/8/2013	**0.00427**	**0.0112**	**0.014**	**37**	**0.015** J	**10**			**0.17**		**67**						**22000**																				
KK-SDA24	KK-SDA24-8.0/10.0	8	10	11/8/2013	**9.4**	**21**	**28.4**	**150**	**0.46**	**370**			**5.6**		**470**						**27000**												**0**	**3.1**	**0.2**	**0.2**	**2.7**	**28.8**	**68.1**	
KK-SDA24	KK-SDA24-10.0/11.3	10	11.3	11/8/2013	**21.5**	**11**	**20.9**	**130**	**0.43**	**450**			**8.8**		**530**						**25000**																				
KK-SDA25	KK-SDA25-0.0/0.3	0	0.3	11/5/2013	**0.914**	**6.86**	**12.8**	**56**	**0.16**	**120**			**1.6**		**270**						**21000**												**9**	**24.3**	**5.4**	**6.1**	**12.8**	**39.2**	**27.5**	
KK-SDA25	KK-SDA25-0.3/2.0	0.3	2	11/5/2013	**0.964**	**8.16**	**13.7**	**110**	**0.26**	**220**			**3.2**		**480**						**22000**																				
KK-SDA25	KK-SDA25-2.0/4.0	2	4	11/5/2013	**1.9**	**9.71** J	**11.2** J	**250**	**0.26** J	**500**			**5.5**		**630**						**18000**												**0**	**8.7**	**0.1**	**1.1**	**7.5**	**44.7**	**46.6**	

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group					PCB										PAH										PAH					
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8															
WI CBSQG PEC					3										68.4															
WI CBSQG PEC					5										114															
TSCA					50																									
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KK-SDA25	KK-SDA25-4.0/6.0	4	6	11/5/2013											**11.6**	**0.0666**	**0.124**	**0.0607**	**0.236**	**0.903**	**0.852**	**1.15**	**0.728**	**0.691**					**2.4**	**0.185**	**0.75**
KK-SDA25	KK-SDA25-8.0/10.0	8	10	11/5/2013											**4.5**	**0.0335**	**0.047**	**0.0239**	**0.0869 J**	**0.334**	**0.312**	**0.405**	**0.298**	**0.281**					**0.96**	**0.0774**	**0.304**
KK-SDA25	KK-SDA25-12.0/14.0	12	14	11/5/2013											**0.07**	**0.000979 J**	**0.00124 J**	**0.000665 J**	**0.00144 J**	**0.00259**	**0.00163**	**0.00634**	**0.00569**	**0.0097**					**0.0116**	**0.00327**	**0.00334**
KK-SDA25	KK-SDA25-16.0/18.0	16	18	11/5/2013											**0.065**	**0.000825 J**	**0.0011 J**	**0.000519 J**	**0.000734 J**	**0.00228**	**0.00154**	**0.00598**	**0.006**	**0.0114**					**0.00973**	**0.00371**	**0.00304**
KK-SDA26	KK-SDA26-14.0/16.0	14	16	11/8/2013											**0.26**	**0.0115**	**0.00932**	**0.0047**	**0.00707**	**0.00874**	**0.00566**	**0.00734**	**0.00657**	**0.00781**					**0.0262**	**0.00869**	**0.00399 J**
KK-SDA26	KK-SDA26-16.0/18.2	16	18.2	11/8/2013											**0.5**	**0.042**	**0.0154**	**0.00397**	**0.00962**	**0.0114**	**0.00832**	**0.00859**	**0.00718**	**0.00612**					**0.0311**	**0.013**	**0.00502 J**
KK-SDA27	KK-SDA27-0.0/0.3	0	0.3	11/7/2013											**26.4**	**0.223**	**0.16**	**0.242**	**0.652**	**1.8**	**2.24**	**2.76**	**1.94**	**1.74**					**5.32**	**0.298**	**1.86**
KK-SDA27	KK-SDA27-0.3/2.0	0.3	2	11/7/2013											**53.7**	**0.729**	**0.729**	**0.558**	**2.85**	**4.1**	**3.72**	**3.62**	**2.66**	**2.19**					**9.02 D**	**1.79**	**2.41**
KK-SDA27	KK-SDA27-2.0/4.0	2	4	11/7/2013											**1.5**	**0.0253**	**0.024**	**0.0194**	**0.0725 J**	**0.133**	**0.106**	**0.115**	**0.085**	**0.0722**					**0.195 J**	**0.0582**	**0.0791**
KK-SDA27	KK-SDA27-4.0/6.0	4	6	11/7/2013											**0.21**	**0.0018**	**0.00199**	**0.00582**	**0.00952**	**0.0184**	**0.0156**	**0.0171**	**0.0142**	**0.0135**					**0.0342**	**0.00552**	**0.0112**
KK-SDA27	KK-SDA27-8.0/10.0	8	10	11/7/2013											**0.059**	**0.00109 J**	**0.00083 J**	**0.00063 J**	**0.00187**	**0.00272**	**0.00204**	**0.00428**	**0.00371**	**0.00533**					**0.00948**	**0.00436**	**0.00222**
KK-SDA27	KK-SDA27-12.0/14.0	12	14	11/7/2013											**0.056**	**0.00133 J**	**0.00104 J**	**0.000562 J**	**0.00188**	**0.00223**	**0.00148 J**	**0.00424**	**0.00363**	**0.00546**					**0.0083**	**0.00376**	**0.00201**
KK-SDA27	KK-SDA27-16.0/16.7	16	16.7	11/7/2013											**0.19**	**0.00295**	**0.0028**	**0.00168**	**0.00681**	**0.0117**	**0.011**	**0.0147**	**0.0124**	**0.0154**					**0.0327**	**0.00708**	**0.00842**
KK-SDA28	KK-SDA28-0.0/0.3	0	0.3	11/4/2013											**75.9**	**0.952**	**0.525**	**0.662**	**1.84**	**6.31**	**7.71**	**8.24**	**5.83**	**5.36**					**12.4**	**1.02**	**5.82**
KK-SDA28	KK-SDA28-0.3/2.0	0.3	2	11/4/2013											**133**	**1.37**	**1.17**	**1.25**	**3.43**	**11.2**	**12.6**	**13.4**	**9.54**	**8.6**					**24.7 D**	**2.06**	**9.49**
KK-SDA28	KK-SDA28-2.0/4.0	2	4	11/4/2013											**131**	**2.44**	**2.58**	**1.93**	**5.2 J**	**13**	**12**	**12.1**	**8.54**	**6.47**					**15.8 J**	**4.29**	**7.67**
KK-SDA28	KK-SDA28-4.0/6.0	4	6	11/4/2013											**64.2**	**0.906**	**1.46**	**0.634**	**2.71**	**5.22**	**4.75**	**4.84**	**3.12**	**2.52**					**10.2 D**	**2.18**	**2.9**
KK-SDA28	KK-SDA28-6.0/8.0	6	8	11/4/2013											**3.1**	**0.0521**	**0.214**	**0.0204**	**0.164 J**	**0.17**	**0.124**	**0.134**	**0.0982**	**0.084**					**0.427 J**	**0.203**	**0.0948**
KK-SDA28	KK-SDA28-8.0/10.0	8	10	11/4/2013											**0.24**	**0.00379**	**0.00437**	**0.00216**	**0.00758**	**0.0152**	**0.013**	**0.0171**	**0.0134**	**0.0136**					**0.0378**	**0.00975**	**0.00989**
KK-SDA28	KK-SDA28-12.0/14.0	12	14	11/5/2013											**0.1**	**0.00157 J**	**0.0023**	**0.000801 J**	**0.00367**	**0.00553**	**0.00382**	**0.00694**	**0.0064**	**0.00886**					**0.0176**	**0.00456**	**0.00372**
KK-SDA28	KK-SDA28-16.0/18.0	16	18	11/5/2013											**0.063**	**0.00111 J**	**0.00113 J**	**0.000585 J**	**0.00138 J**	**0.00159**	**0.00149 J**	**0.00469**	**0.00578**	**0.0109**					**0.00961**	**0.00347**	**0.0025**
KK-SDU11	KK-SDU11-0.0/0.3	0	0.3	12/18/2012		0.039 UJ	0.039 UJ					0.039 UJ		**0.13 J**	**40.6**	**0.072**	**0.611**	**0.18**	**1.57**	**3.66**	**3.68**	**3.46**	**2.42**	**2.11**					**8.16**	**0.789**	**2.39**
KK-SDU11	KK-SDU11-0.3/2.0	0.3	2	12/18/2012		**0.065**	0.044 U					0.044 U		**0.3**	**174**	**0.451**	**2.73**	**0.682**	**5.22**	**12.8**	**14**	**14.1 D**	**9.69**	**8.74**					**36.8 D**	**3.84**	**9.77**
KK-SDU11	KK-SDU11-2.0/4.0	2	4	12/18/2012		**0.075**	0.049 U				0.049 U	0.049 U		**0.36**	**217**	**0.981**	**2.65**	**0.974**	**5.84**	**15.5**	**17.5**	**21.1**	**13.4**	**11.4**					**45.7 D**	**4.29**	**12 J**
KK-SDU11	KK-SDU11-4.0/6.0	4	6	12/18/2012		**0.029 J**	0.051 U				**0.3**	0.051 U		0.051 U	**229**	**1.33**	**2.2**	**1.45**	**5.87**	**16.1**	**17.3**	**20.6**	**14.3**	**12.3**					**51.8 D**	**4.45**	**13.9 J**
KK-SDU11	KK-SDU11-6.0/7.0	6	7	12/18/2012		**0.12 J**	**0.29 J**				0.053 U	0.053 U		0.053 U	**219**	**1.42**	**2.55**	**0.932**	**5.51**	**16.1**	**17.6**	**19.3**	**13.4**	**11.7**					**48.2 D**	**4.21**	**11.9 J**
KK-SDU12	KK-SDU12-0.0/0.3	0	0.3	12/19/2012		2.1 UJ	2.1 UJ					2.1 UJ		**13 J**	**94.9**	**0.275**	**0.892**	**0.153**	**1.96**	**7.61**	**8.16**	**8.77**	**5.65**	**5.08**					**21.5 D**	**1.26**	**5.55**
KK-SDU12	KK-SDU12-0.3/2.0	0.3	2	12/19/2012		2.2 UJ	2.2 UJ					2.2 UJ		2.2 UJ	**172**	**0.586**	**2.13**	**0.412**	**4.26**	**12.9**	**13.2**	**15.1**	**9.88**	**8.3**					**40.5 D**	**3.32**	**9.07**
KK-SDU12	KK-SDU12-2.0/4.0	2	4	12/19/2012		**0.51 J**	1.1 UJ				**6.3 J**	1.1 UJ		1.1 UJ	**258**	**1.56**	**2.15**	**0.829**	**7.2**	**17.8**	**19.9**	**25.4**	**17**	**13.4**					**55.6**	**4.74**	**14.5**
KK-SDU12	KK-SDU12-4.0/6.0	4	6	12/19/2012		**0.41 J**	0.48 UJ				**2.5 J**	0.48 UJ		0.48 UJ	**269**	**0.984**	**2.7**	**0.463**	**6.47**	**20.1**	**22.4**	**26.9**	**17.6**	**15**					**57.2 D**	**4.43**	**16.1**
KK-SDU12	KK-SDU12-6.0/8.0	6	8	12/19/2012		0.045 U	**0.024 J**				0.045 U	0.045 U		0.045 U	**128**	**0.694**	**1.06**	**0.282**	**2.8**	**9.74**	**10.8**	**12**	**8.93**	**7.03**					**27.3 D**	**1.79**	**7.55**
KK-SDU13	KK-SDU13-0.0/0.3	0	0.3	12/19/2012		0.14 U	0.14 U					0.14 U		**0.47**	**14.1**	**0.172**	**0.375**	**0.0359**	**0.36**	**1.15**	**1.19**	**1.2**	**0.875**	**0.758**					**3.08**	**0.306**	**0.803**
KK-SDU13	KK-SDU13-0.3/2.0	0.3	2	12/19/2012		0.35 UJ	0.35 UJ					0.35 UJ		**1.2 J**	**145**	**4.81**	**2.72**	**0.145**	**5.39**	**10.8 D**	**10.7 D**	**9.4 D**	**6.32**	**6**					**29.9 D**	**3.27**	**6.48**
KK-SDU13	KK-SDU13-2.0/4.0	2	4	12/19/2012		2.1 UJ	2.1 UJ				**14 J**	2.1 UJ		2.1 UJ	**224**	**1.28**	**2.82**	**0.525**	**8.44**	**16.5**	**16.1**	**18.2**	**12.6**	**9.89**					**48.5 D**	**5.68**	**10.9**
KK-SDU13	KK-SDU13-4.0/6.0	4	6	12/19/2012		**0.23**	**1.3**				0.21 U	0.21 U		0.21 U	**352**	**3.02**	**5.08**	**0.742**	**12.9**	**25**	**25.7**	**27.4**	**18.4**	**16.2**					**72.7 D**	**9.4**	**16.7**
KK-SDU13	KK-SDU13-6.0/8.0	6	8	12/19/2012		**0.095**	**0.11**				0.051 U	0.051 U		0.051 U	**290**	**2.18**	**3.47**	**0.462**	**8.5**	**22**	**23.2**	**24.7**	**17.7**	**14.8**					**58.4 D**	**6.81**	**16.1**
KK-SDU14	KK-SDU14-0.0/0.3	0	0.3	12/19/2012		0.05 U	0.05 U					0.05 U		0.05 U	**47.7**	**0.0452**	**0.301**	**0.076**	**0.946**	**3.84**	**4.12**	**4.56**	**2.92**	**2.76**					**10.7**	**0.425**	**3.01**
KK-SDU14	KK-SDU14-0.3/2.0	0.3	2	12/19/2012		0.034 U	0.034 U					0.034 U		**0.15**	**37.2**	**0.0826**	**0.728**	**0.092**	**1.14**	**2.99**	**2.77**	**3.03**	**1.86**	**1.48**					**8.42 D**	**0.933**	**1.72**
KK-SDU14	*KK-SDU14-2.0/4.5*	2	4.5	12/19/2012		0.037 U	0.037 U				0.037 U	0.037 U		0.037 U	**72.6**	**0.398**	**1.34**	**0.102**	**2.65**	**5.33**	**4.69**	**4.52**	**3.12**	**2.42**					**15.5 D**	**2.15**	**2.7**
KK-SDU15	*KK-SDU15-0.0/0.3*	0	0.3	12/19/2012		0.039 U	0.039 U					0.039 U		0.039 U	**14.7**	**0.0164**	**0.0688**	**0.0694**	**0.393**	**1.29**	**1.33**	**1.36**	**0.978**	**0.849**					**3.16**	**0.126**	**0.922**
KK-SDU15	*KK-SDU15-0.3/2.5*	0.3	2.5	12/19/2012		0.037 U	0.037 U				0.037 U	0.037 U		0.037 U	**0.22**	**0.00813**	**0.00304**	**0.00134**	**0.00414**	**0.012**	**0.013**	**0.0152**	**0.0149**	**0.0165**					**0.0381**	**0.00342**	**0.00971**
KR01	KR01-0.0/0.3	0	0.3	3/16/2009		**0.14 J**	0.14 UJ					0.14 UJ		0.14 UJ	**116**	**0.443**	**0.577**	**0.548**	**2.09 J**	**6.83**	**9.86 J**	**9.59**	**6.63**	**6.16**	**7.76**	**10**	**1.46**	**20.9 J**	**0.915 J**	**6.38**
KR01	KR01-4.0/6.0	4	6	3/16/2009		**0.48 J**	1.1 U				**7.3**	1.1 U		1.1 U	**251**	**3.6**	**5.13**	**2.08**	**10.6**	**16.8**	**16**	**15.2**	**10.4**	**7.76**	**12.3**	**19.9**		**41**	**7.23**	**8.62**
KR01	KR01-8.0/10.0	8	10	3/16/2009		**0.12**	0.11 U				**0.89**	0.11 U		0.11 U	**409**	**14.2**	**25.7**	**2.6**	**21.9**	**21.7**	**19.5**	**15.1**	**10.9**	**8.37**	**14.6**	**22.3**		**49.2**	**21.3**	**9.36**
KR02	KR02-0.0/0.3	0	0.3	3/16/2009		**0.078 J**	0.14 U					0.14 U		0.14 U	**136**	**0.384**	**0.696**	**0.612**	**2.33**	**7.89**	**11.3**	**10.9**	**7.65**	**7.13**	**9.2**	**11.7**	**1.82**	**25.1**	**1.04**	**7.45**
KR02	KR02-6.0/8.0	6	8	3/16/2009		**0.27 J**	0.44 U				**3**	0.44 U		0.44 U	**126**	**2.88**	**2.3**	**0.835**	**4.25**	**7.64**	**7.84**	**7.24**	**5.22**	**4.02**	**6.48**	**9.63**		**20.4**	**3.14**	**4.42**
KR02	KR02-8.0/10.0	8	10	3/16/2009		**0.27**	0.25 U				**1.8**	0.25 U		0.25 U	**271**	**7.01**	**8.1**	**2.34**	**12.7**	**15.1**	**14.5**	**12.5**	**8.96**	**6.69**	**10.9**	**16.6**		**35.8**	**11.8**	**7.42**
KR02	KR02-10.0/11.7	10	11.7	3/16/2009		**0.025 J**	0.047 U				**0.18**	0.047 U		0.047 U	**163**	**4.73**	**4.6**	**0.927**	**7.62**	**8.46**	**7.76**	**5.95**	**4.2**	**3.41**	**5.42**	**8.7**		**20.6**	**5.16**	**3.67**
KR03	KR03-0.0/0.3	0	0.3	3/16/2009		**0.19 J**	0.32 U					0.32 U		0.32 U	**151**	**0.756**	**1.18**	**0.58**	**3.25 J**	**8.94**	**12.1 J**	**11.4**	**7.8**	**7.16**	**9.05**	**12.3**	**1.82**	**28.2 J**	**1.58 J**	**7.6**
KR03	KR03-6.0/8.0	6	8	3/16/2009		**0.49 J**	0.52 U				**3.7**	0.52 U		0.52 U	**240**	**7.07**	**4.73**	**1.85**	**8.54**	**13.7**	**13.3**	**11.7**	**8.6**	**6.34**	**11.1**	**16.5**		**34.2**	**6.38**	**6.95**
KR03	KR03-10.0/12.0	10	12	3/16/2009		0.056 U	0.056 U				0.056 U	0.056 U		0.056 U	**793**	**41.1**	**34**	**4.49**	**32.5 J**	**28.3**	**26 J**	**17.5**	**12.9**	**10.6**	**18.7**	**27.1**		**75.7 J**	**28.1 J**	**11.5**
KR04	KR04-0.0/0.3	0	0.3	3/16/2009		**0.23**	0.16 U					0.16 U		0.16 U	**78.9**	**0.245**	**0.396**	**0.376**	**1.16**	**4.16**	**6.43**	**6.48**	**4.76**	**4.49**	**5.69**	**6.85**	**1.04**	**14.4**	**0.567**	**4.63**
KR04	KR04-6.0/8.0	6	8	3/16/2009		**1.4**	0.62 U				**5.5**	0.62 U		0.62 U	**357**	**2.33**	**3.67**	**1.56**	**8.69**	**20.2**	**26.1**	**24.4**	**16.7**	**15.7**	**20**	**27.3**		**63.2**	**5.32**	**16.6**
KR04	KR04-10.0/13.0	10	13	3/16/2009		**0.76 J**	1.2 U				**8.6**	1.2 U		1.2 U	**213**	**2.04**	**1.95**	**1.19**	**6.08**	**13**	**14.4**	**14.4**	**10**	**7.85**	**12.3**	**18.1**		**39.3**	**3.87**	**8.6**
KKR-22-001	MK-KKR-22-001-0.0/1.0	0	1	11/8/2022	**3.52**	**0.82 J**	**1.3 J**	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	**1.4 J**	**60.95**	**0.25**	**0.49**	**0.29**	**1.3**	**4.2**	**4.6**	**7.1**	**2.8**	**2.9**	**1.8**	**5.3**	**0.71**	**11**	**0.66**	**4.2**
KKR-22-001	MK-KKR-22-001-1.0/2.0	1	2	11/8/2022	**1.58**	**0.25 J**	**0.63 J**	0.88 U	1.2 U	0.88 U	0.88 U	0.88 U	0.88 U	**0.7 J**	**171.14**	**0.26**	**1.4**	**0.55**	**6.6**	**16**	**13**	**17**	**7**	**6.4**	**5.2**	**13**	**1.7**	**32**	**1.8**	**8.9**
KKR-22-001	MK-KKR-22-001-2.0/3.0	2	3	11/8/2022	**10.6**	**1.6 J**	**3.4 J**	0.92 U	1.2 U	0.92 U	0.92 U	0.92 U	0.92 U	**5.6 J**	**117.1**	**0.67**	**4.7**	**0.53**	**2.9**	**6.9**	**7.7**	**11**	**4.9**	**4.9**	**3**	**8**	**1.2**	**19**	**4.9**	**6.6**
KKR-22-001	MK-KKR-22-001-5.0/6.0	5	6	11/8/2022	**18.2**	**3.7 J**	**7.2 J**	0.94 U	1.3 U	0.94 U	0.94 U	0.94 U	0.94 U	**7.3 J**	**111.5**	**0.85**	**1.2**	**0.55**	**3.1**	**7.8**	**7.5**	**10**	**4.9**	**4.7**	**2.8**	**8.6**	**1.2**	**20**	**1.5**	**6.2**
KKR-22-001	MK-KKR-22-001-6.0/7.0	6	7	11/8/2022	**5.32**	**0.82 J**	**3 J**	0.96 U	1.3 U	0.96 U	0.96 U	0.96 U	0.96 U	**1.5 J**	**107.9**	**1.5**	**1.1**	**1.1**	**4.8**	**6.8**	**6.8**	**9.2**	**5.2**	**4.5**	**2.7**	**7.7**	**1.6**	**16**	**1.6**	**5.5**
KKR-22-001	MK-KKR-22-001-7.0/8.1	7	8.1	11/8/2022	**0.037**	1.1 U	1.1 U	1.1 U	1.4 U	1.1 U	1.1 U	1.1 U	1.1 U	**0.037 J**	**143.8**	**4.5 J-**	**3 J-**	**1.3 J-**	**7 J-**	**8.4 J-**	**5.7 J-**	**9.3 J-**	**3.8 J-**	**3.1 J-**	**2.9 J-**	**7 J-**	**1.1 J-**	**17 J-**	**3.5 J-**	**3.2 J-**
KKR-22-001	MK-KKR-22-001-10.0/11.0	10	11	11/8/2022	0.75 U	1.1 U	1.1 U	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**8.142**	**0.17 J-**	**0.24 J-**	**0.091 J-**	**0.33 J-**	**0.79 J-**	**0.5 J-**	**0.76 J-**	**0.31 J-**	**0.3 J-**	**0.21 J-**	**0.49 J-**	**0.069 J-**	**1.1 J-**	**0.092 J-**	**0.28 J-**
KKR-22-001	MK-KKR-22-001-11.0/12.0	11	12	11/8/2022	0.75 U	1.2 U	1.2 U	1.2 U	1.5 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**0.15**	**0.004 J-**	**0.003 J-**	**0.005 J-**	**0.006 J-**	**0.006 J-**	**0.005 J-**	**0.013 J-**	**0.008 J-**	**0.005 J-**	**0.002 J-**	**0.008 J-**	0.01 UJ	**0.016 J-**	**0.012 J-**	**0.005 J-**
KKR-22-001	MK-KKR-22-001-12.0/13.0	12	13	11/8/2022	0.75 U	1.1 U	1.1 U	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**0.15**	**0.003 J-**	**0.003 J-**	**0.004 J-**	**0.01 J-**	**0.006 J-**	**0.004 J-**	**0.014 J-**	**0.006 J-**	**0.005 J-**	0.01 UJ	**0.008 J-**	0.01 UJ	**0.015 J-**	**0.012 J-**	**0.005 J-**
KKR-22-001	MK-KKR-22-001-13.0/13.7	13	13.7	11/8/2022	0.7 U	1.1 U	1.1 U	1.1 U	1.4 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**0.15**	**0.002 J-**	0.009 UJ	**0.01 J-**	**0.006 J-**	**0.008 J-**	0.009 UJ	**0.014 J-**	**0.009 J-**	**0.007 J-**	**0.002 J-**	**0.009 J-**	0.009 UJ	**0.013 J-**	**0.006 J-**	**0.005 J-**
KKR-22-002	MK-KKR-22-002-0.0/1.0	0	1	11/8/2022	**8.7**	**2.1 J**	**3.6 J**	1.4 U	1.9 U	1.4 U	1.4 U	1.4 U	1.4 U	**3 J**	**74.58**	**0.46**	**0.4**	**0.46**	**1.4**	**4.4**	**5.7**	**9.4**	**3.8**	**3.9**	**2.7**	**6.4**	**0.93**	**13**	**0.63**	**5.8**
KKR-22-002	MK-KKR-22-002-1.0/2.0	1	2	11/8/2022	**28.9**	**5.9 J**	**12 J**	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	**11 J**	**222.55**	**1**	**2**	**0.85**	**8.2**	**15**	**16**	**21**	**9.7**	**10**	**8.2**	**18**	**2.3**	**39**	**2.9**	**14**
KKR-22-002	MK-KKR-22-002-2.0/3.0	2	3	11/8/2022	**17.9**	**3.4 J**	**11 J**	1.2 U	1.6 U	1.2 U	1.2 U	1.2 U	1.2 U	**3.5 J**	**210.9**	**3.2**	**1.8**	**1.8**	**9.6**	**12**	**12**	**17**	**8.3**	**7.3**	**5.4**	**16**	**1.7**	**34**	**3.1**	**9.7**
KKR-22-002	MK-KKR-22-002-3.0/3.8	3	3.8	11/8/2022	0.65 U	1 U	1 U	1 U	1.3 U	1 U	1 U	1 U	1 U	1 U	**148.4**	**3.7**	**3.2**	**1.2**	**7.7**	**10**	**8.7**	**9.9**	**4.6**	**4.6**	**2.6**	**9.4**	**1.1**	**23**	**4.4**	**5.9**
KKR-22-002	MK-KKR-22-002-5.0/6.0	5	6	11/8/2022	0.85 U	1.3 U	1.3 U	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**31.97**	**1.1**	**0.7**	**0.2**	**0.84**	**1.1**	**0.75**	**0.95**	**0.59**	**0.4**	**0.25**	**1.1**	**0.13**	**2.7**	**0.86**	**0.5**
KKR-22-003	MK-KKR-22-003-0.0/1.0	0	1	11/8/2022	**42**	**11 J**	**18 J**	1.5 U	2 U	1.5 U	1.5 U	1.5 U	1.5 U	**13 J**	**161.1**	**2**	**3.9**	**0.8**	**4.5**	**9.7**	**11**	**17**	**7.4**	**7.7**	**4.7**	**12**	**1.7**	**25**	**3.7**	**10**
KKR-22-003	MK-KKR-22-003-1.0/2.0	1	2	11/8/2022	**59**	**15 J**	**28 J**	2.5 U	3.4 U	2.5 U	2.5 U	2.5 U	2.5 U	**16 J**	**223.3**	**3.7**	**2**	**2.8**	**8.3**	**16**	**15**	**21**	**9.6**	**8.6**	**6.6**	**19**	**2**	**36**	**3.7**	**12**
KKR-22-003	MK-KKR-22-003-2.0/3.1	2	3.1	11/8/2022	1.05 U	1.6 U	1.6 U	1.6 U	2.1 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	**301.8**	**8**	**4.3**	**2.8**	**17**	**21**	**17**	**22**	**11**	**9.2**	**7.1**	**21**	**2.4**	**44**	**8**	**12**
KKR-22-003	MK-KKR-22-003-5.0/6.0	5	6	11/8/2022	1.05 U	1.6 U	1.6 U	1.6 U	2.1 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	**113.17**	**4.7**	**2.5**	**1.1**	**4.8**	**7.1**	**4.9**	**6.5**	**2.9**	**2.3**	**1.9**	**6.2**	**0.67**	**16**	**3.4**	**3.2**
KKR-22-003	MK-KKR-22-003-6.0/7.0	6	7	11/8/2022	1.1 U	1.6 U	1.6 U	1.6 U	2.2 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	**154.1**	**2.4**	**2.4**	**1.1**	**9.5**	**12**	**9**	**11**	**4.7**	**4**	**3.3**	**11**	**1.2**	**23**	**3.9**	**5.6**
KKR-22-003	MK-KKR-22-003-7.0/8.0	7	8	11/8/2022	1 U	1.5 U	1.5 U	1.5 U	2 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	**153.5**	**3 J-**	**3.5 J-**	**1.3 J-**	**9.1 J-**	**11 J-**	**7 J-**	**11 J-**	**4.4 J-**	**3.8 J-**	**2.9 J-**	**8.7 J-**	**1.2 J-**	**23 J-**	**4.8 J-**	**3.8 J-**
KKR-22-003	MK-KKR-22-003-10.0/11.0	10	11	11/8/2022	1.05 U	1.6 U	1.6 U	1.6 U	2.1 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	**16.428**	**0.57 J-**	**0.31 J-**	**0.16 J-**	**0.64 J-**	**0.91 J-**	**0.54 J-**	**0.82 J-**	**0.36 J-**	**0.38 J-**	**0.23 J-**	**0.7 J-**	**0.078 J-**	**2.2 J-**	**0.49 J-**	**0.34 J-**
KKR-22-003	MK-KKR-22-003-11.0/12.0	11	12	11/8/2022	0.95 U	1.4 U	1.4 U	1.4 U	1.9 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**0.31**	**0.006 J-**	**0.009 J-**	**0.012 J-**	**0.018 J-**	**0.017 J-**	**0.012 J-**	**0.023 J-**	**0.016 J-**	**0.01 J-**	**0.004 J-**	**0.014 J-**	0.012 UJ	**0.034 J-**	**0.017 J-**	**0.009 J-**
KKR-22-003	MK-KKR-22-003-12.0/13.0	12	13	11/8/2022	0.85 U	1.3 U	1.3 U	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**1.806**	**0.004 J-**	**0.005 J-**	**0.008 J-**	**0.036 J-**	**0.17 J-**	**0.14 J-**	**0.26 J-**	**0.1 J-**	**0.1 J-**	**0.063 J-**	**0.15 J-**	**0.032 J-**	**0.24 J-**	**0.017 J-**	**0.1 J-**
KKR-22-003	MK-KKR-22-003-13.0/14.0	13	14	11/8/2022	0.85 U	1.2 U	1.2 U	1.2 U	1.7 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	**0.26**	**0.005 J-**	**0.006 J-**	**0.016 J-**	**0.015 J-**	**0.016 J-**	0.01 UJ	**0.02 J-**	**0.017 J-**	**0.01 J-**	**0.004 J-**	**0.015 J-**	0.01 UJ	**0.029 J-**	**0.014 J-**	**0.007 J-**
KKR-22-004	KK-KKR-22-004-0.0/1.0	0	1	11/9/2022	**8.3**	**2.1 J**	**3.7 J**	1.3 U	1.8 U	1.3 U	1.3 U	1.3 U	1.3 U	**2.5 J**	**70.01**	**0.29**	**0.35**	**0.38**	**1.5**	**4.3**	**5.6**	**8.5**	**3.7**	**3.6**	**2.4**	**6.1**	**0.85**	**12**	**0.58**	**5.6**

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																		Physical Parameters								
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																								
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	Chromium mg/kg	Mercury mg/kg	Lead mg/kg	Nickel mg/kg	Arsenic mg/kg	Cadmium mg/kg	Copper mg/kg	Zinc mg/kg	Silver mg/kg	Barium mg/kg	Selenium mg/kg	Aluminum mg/kg	Iron mg/kg	Manganese mg/kg	Potassium mg/kg	Sodium mg/kg	Thallium mg/kg	Antimony mg/kg	Beryllium mg/kg	Cobalt mg/kg	Calcium mg/kg	Cyanide mg/kg	Magnesium mg/kg	Vanadium mg/kg	TOC mg/kg	Gravel %	Sand %	Coarse Sand %	Medium Sand %	Fine Sand %	Silt %	Clay %	Fines %
KK-SDA25	KK-SDA25-4.0/6.0	4	6	11/5/2013	**0.16**	**1.38**	**1.88**	**29**	**0.032**	**43**			**0.57**		**92**					**15000**																				
KK-SDA25	KK-SDA25-8.0/10.0	8	10	11/5/2013	**0.0857**	**0.528**	**0.758**	**25**	**0.022** J	**23**			**0.42**		**70**					**18000**																				
KK-SDA25	KK-SDA25-12.0/14.0	12	14	11/5/2013	**0.00196**	**0.00888**	**0.0106**	**16**	**0.01** J	**6.9**			**0.14**		**41**					**17000**																				
KK-SDA25	KK-SDA25-16.0/18.0	16	18	11/5/2013	**0.00145** J	**0.00802**	**0.00909**	**22**	**0.01** J	**8.2**			**0.2**		**46**					**19000**																				
KK-SDA26	KK-SDA26-14.0/16.0	14	16	11/8/2013	**0.105**	**0.0244**	**0.0205**	**27**	**0.02** J	**9.8**			**0.21**		**66**					**18000**																				
KK-SDA26	KK-SDA26-16.0/18.2	16	18.2	11/8/2013	**0.284**	**0.0325**	**0.0237**	**10**	0.025 U	**5**			**0.083** J		**32**					**4100**													**3.4**	**31.8**	**4.7**	**5.8**	**21.3**	**46**	**18.8**	
KK-SDA27	KK-SDA27-0.0/0.3	0	0.3	11/7/2013	**0.717**	**1.94**	**4.53**	**43**	**0.13**	**58**			**0.97**		**130**					**11000**													**0.8**	**62.7**	**0.4**	**30.9**	**31.4**	**28.5**	**8**	
KK-SDA27	KK-SDA27-0.3/2.0	0.3	2	11/7/2013	**5.61**	**6.5** D	**7.2** D	**46**	**0.53**	**210**			**2.6**		**410**					**11000**																				
KK-SDA27	KK-SDA27-2.0/4.0	2	4	11/7/2013	**0.168**	**0.188** J	**0.153** J	**8.6**	**0.02** J	**11**			**0.19**		**41**					**6400** J																				
KK-SDA27	KK-SDA27-4.0/6.0	4	6	11/7/2013	**0.0106**	**0.0186**	**0.0281**	**12**	**0.011** J	**5.8**			**0.14**		**45**					**9800**													**0**	**5.7**	**0.4**	**1**	**4.3**	**73.9**	**20.4**	
KK-SDA27	KK-SDA27-8.0/10.0	8	10	11/7/2013	**0.00378**	**0.00794**	**0.00886**	**17**	**0.021** J	**6.2**			**0.27**		**52**					**15000**																				
KK-SDA27	KK-SDA27-12.0/14.0	12	14	11/7/2013	**0.00477**	**0.00719**	**0.00796**	**18**	**0.022** J	**6.9**			**0.26**		**55**					**19000**																				
KK-SDA27	KK-SDA27-16.0/16.7	16	16.7	11/7/2013	**0.0141**	**0.0235**	**0.0286**	**20**	**0.02** J	**8.7**			**0.21**		**51**					**19000**																				
KK-SDA28	KK-SDA28-0.0/0.3	0	0.3	11/4/2013	**3.18**	**5.68**	**10.4**	**82**	**0.31**	**110**			**2.2**		**270**					**17000**													**5.6**	**27.4**	**0.7**	**2.9**	**23.8**	**42**	**25**	
KK-SDA28	KK-SDA28-0.3/2.0	0.3	2	11/4/2013	**5.08**	**11.3**	**17.8**	**320**	**0.5**	**350**			**6.8**		**550**					**23000**													**2.5**	**18.6**	**0.4**	**1.7**	**16.5**	**43.3**	**35.6**	
KK-SDA28	KK-SDA28-2.0/4.0	2	4	11/4/2013	**12.4**	**14** J	**12.8** J	**160**	**0.64** J	**240**			**4.8**		**350**					**17000** J																				
KK-SDA28	KK-SDA28-4.0/6.0	4	6	11/4/2013	**5.82**	**8.97** D	**8.01** D	**74**	**0.26**	**53**			**0.86**		**92**					**11000**																				
KK-SDA28	KK-SDA28-6.0/8.0	6	8	11/4/2013	**0.287**	**0.704** J	**0.32** J	**28**	**0.037**	**9.2**			**0.37**		**60**					**19000**																				
KK-SDA28	KK-SDA28-8.0/10.0	8	10	11/4/2013	**0.0313**	**0.0308**	**0.0319**	**19**	**0.013** J	**7.4**			**0.27**		**54**					**19000**																				
KK-SDA28	KK-SDA28-12.0/14.0	12	14	11/5/2013	**0.00562**	**0.0132**	**0.0155**	**20**	**0.012** J	**7.4**			**0.19**		**46**					**18000**																				
KK-SDA28	KK-SDA28-16.0/18.0	16	18	11/5/2013	**0.00149** J	**0.0075**	**0.00956**																																
KK-SDU11	KK-SDU11-0.0/0.3	0	0.3	12/18/2012	**0.0617**	**4.69**	**6.71**	**40** J	**0.035**	**84** J	**8.7** J	**2.5**	**1.1** J		**240**	**0.051** J	**92**	**0.21** J	**3000** J	**9600** J	**290** J	**560**	**220** J	**0.11**	**0.1** J	**0.18**	**3.3** J	**0000** J	**0.52** J		**11**	**2.5**	**93.9**	**3.2**	**63.6**	**27.1**	**2.9**	**0.7**	
KK-SDU11	KK-SDU11-0.3/2.0	0.3	2	12/18/2012	**0.328**	**26** D	**28.5** D	**46** J	**0.21**	**290** J	**15** J	**5.6**	**2.3** J		**400**	**2**	**74**	**0.33** J	**6800** J	**13000** J	**320** J	**1300**	**280** J	**0.19**	**0.37** J	**0.46**	**4.5** J	**9000** J	**0.45** J		**20**								
KK-SDU11	KK-SDU11-2.0/4.0	2	4	12/18/2012	**0.422**	**29.4** D	**35.6** D	**80** J	**0.46**	**350** J	**31** J	**9.2**	**7.4** J		**530**	**1.7**		**1.6**	**9400** J	**18000** J	**460** J	**1800**	**280** J	**0.29**	**0.42** J	**0.65**		**66000** J	**0.61** J	**33000** J	**28**								
KK-SDU11	KK-SDU11-4.0/6.0	4	6	12/18/2012	**0.7**	**29.5**	**37.4**	**140** J	**0.51**	**450** J	**37** J	**15**	**10** J		**740**	**3.5**		**2**	**12000** J	**20000** J	**400** J	**2200**	**310** J	**0.34**	**1.2** J	**0.69**		**65000** J	**0.71** J	**31000** J	**31**								
KK-SDU11	KK-SDU11-6.0/7.0	6	7	12/18/2012	**1.54**	**28.5**	**35.8**	**230** J	**1.1**	**520** J	**39** J	**20**	**35** J		**1500**	**2**		**2.4**	**9000** J	**18000** J	**330** J	**1600**	**300** J	**0.41**	**0.99** J	**0.7**		**55000** J	**3.4**	**24000** J	**29**								
KK-SDU12	KK-SDU12-0.0/0.3	0	0.3	12/19/2012	**0.321** J	**10.9**	**16.8** D	**60** J	**0.35** J	**310** J	**18**	**4.9**	**3**		**360**	**0.67**	**72** J	**0.63** J	**6400**	**13000**	**350**	**1400**	**340** J	**0.2**	**0.36** J	**0.34**	**5.2**	**66000**	**0.25** J		**20**	**0.4**	**61.6**	**0.2**	**4.7**	**56.7**	**28**	**10**	
KK-SDU12	KK-SDU12-0.3/2.0	0.3	2	12/19/2012	**0.282**	**24.8**	**27.6**	**79** J	**0.33** J	**350** J	**26**	**7.5**	**11**		**550**	**1.6**	**100** J	**1.1**	**9700**	**17000**	**410**	**2000**	**350** J	**0.26**	**0.28** J	**0.51**	**7.2**	**70000**	**1.1**		**24**	**0**	**27**	**0**	**0.7**	**26.3**	**43.1**	**29.9**	
KK-SDU12	KK-SDU12-2.0/4.0	2	4	12/19/2012	**0.721**	**35.2**	**42.1**	**130** J	**0.54** J	**570** J	**38**	**17**	**12**		**830**	**2.3**		**1.7**	**12000**	**21000**	**460**	**2400**	**380** J	**0.36**	**1.1** J	**0.65**		**58000**	**1.1**	**32000**	**31**								
KK-SDU12	KK-SDU12-4.0/6.0	4	6	12/19/2012	**0.725**	**35.4**	**42.9** D	**210** J	**0.48** J	**420** J	**41**	**16**	**17**		**930**	**1.6**		**1.7**	**12000**	**21000**	**440**	**2500**	**360** J	**0.37**	**0.75** J	**0.74**		**58000**	**1.8**	**32000**	**31**								
KK-SDU12	KK-SDU12-6.0/8.0	6	8	12/19/2012	**0.805**	**16**	**20.9**	**160** J	**0.34** J	**170** J	**31**	**9.6**	**17**		**800**	**0.77**		**1.4**	**9500**	**17000**	**500**	**1800**	**300** J	**0.33**	**0.3** J	**0.69**		**67000**	**0.97**	**35000**	**30**								
KK-SDU13	KK-SDU13-0.0/0.3	0	0.3	12/19/2012	**0.1**	**1.31**	**2.39**	**28** J	**0.017** J	**27** J	**11**	**2.7**	**1.6**		**130**	**0.085** J	**93** J	**0.48** J	**2900**	**8800**	**950**	**550**	**260** J	**0.071** J	0.2 UBJ	**0.47**	**3.5**	**96000**	**0.26** J		**14**								
KK-SDU13	KK-SDU13-0.3/2.0	0.3	2	12/19/2012	**0.962**	**25** D	**23** D	**17** J	**0.026** J	**58** J	**12**	**2.8**	**1.4**		**170**	**0.064** J	**28** J	**0.41** J	**2900**	**10000**	**360**	**540**	**340** J	**0.076** J	0.23 UBJ	**0.3**	**3**	**81000**	**0.43** J		**9.9**	**31**	**66.5**	**13.8**	**36.7**	**16**	**1.5**	**1.1**	
KK-SDU13	KK-SDU13-2.0/4.0	2	4	12/19/2012	**0.551**	**37.4**	**34.5**	**56** J	**0.14** J	**310** J	**22**	**7.6**	**5.6**		**430**	**1.4**		**0.91**	**6400**	**13000**	**280**	**1200**	**430** J	**0.18**	**1.2** J	**0.36**		**51000**	**0.74**	**26000**	**17**	**2.9**	**79.4**	**8.3**	**22.8**	**48.3**	**9.1**	**8.6**	
KK-SDU13	KK-SDU13-4.0/6.0	4	6	12/19/2012	**2.39**	**60.2** D	**55.7** D	**120** J	**0.3** J	**320** J	**32**	**11**	**13**		**700**	**0.89**		**1.2**	**6200**	**15000**	**310**	**1200**	**430** J	**0.23**	**1.1** J	**0.42**		**55000**	**1.7**	**27000**	**21**								
KK-SDU13	KK-SDU13-6.0/8.0	6	8	12/19/2012	**1.6**	**44.9**	**44.8**	**600** J	**0.69** J	**600** J	**57**	**24**	**110**		**3600**	**2.4**		**2.4**	**11000**	**24000**	**380**	**2000**	**510** J	**0.45**	**0.99** J	**0.65**		**52000**	**6.4** J	**26000**	**29**								
KK-SDU14	KK-SDU14-0.0/0.3	0	0.3	12/19/2012	**0.0607**	**5.62** J	**8.32**	**24** J	**0.029** J	**29** J	**12**	**2.1**	**0.55**		**120**	**0.049** J	**79** J	**0.58** J	**3300**	**9600**	**300**	**640**	**580** J	**0.074** J	0.28 UBJ	**0.24**	**3.5**	**74000**	**0.32** J		**15**								
KK-SDU14	KK-SDU14-0.3/2.0	0.3	2	12/19/2012	**0.129**	**5.5** D	**6.29** D	**21** J	**0.094** J	**70** J	**12**	**4.5**	**4.3**		**210**	**0.4**	**39** J	**0.46** J	**3000**	**8100**	**760**	**540**	**290** J	**0.11**	**0.34** J	**0.27**	**4.7**	**88000**	**0.32** J		**15**								
KK-SDU14	*KK-SDU14-2.0/4.5*	2	4.5	12/19/2012	**0.5**	**15.4** D	**11.8** D	**32** J	**0.067** J	**130** J	**15**	**4.4**	**1.1**		**210**	**0.27**		**0.68**	**3200**	**8800**	**790**	**600**	**360** J	**0.16**	**0.46** J	**0.31**		**55000**	**0.35** J	**29000**	**14**	**10.8**	**80.6**	**11.7**	**31.8**	**37.1**	**5**	**3.7**	
KK-SDU15	*KK-SDU15-0.0/0.3*	0	0.3	12/19/2012	**0.0171**	**1.67**	**2.49**	**20** J	**0.01** J	**12** J	**9.1**	**1.9**	**0.36**		**80**	**0.036** J	**71** J	**0.38** J	**3300**	**10000**	**340**	**560**	**460** J	**0.061** J	0.24 UBJ	**0.19**	**3.2**	**100000**	**0.38** J		**12**	**3.2**	**91.5**	**14.3**	**68.3**	**8.9**	**4.1**	**1.2**	
KK-SDU15	*KK-SDU15-0.3/2.5*	0.3	2.5	12/19/2012	**0.00243**	**0.0389**	**0.0343**	**30** J	**0.011** J	**12** J	**22**	**4.7**	**0.4**		**45**	**0.053** J	**47** J	**0.64**	**10000**	**15000**	**440**	**3300**	**360** J	**0.23**	0.2 UJ	**0.56**	**7.7**	**90000**	**0.15** J	**43000**	**23**								
KR01	KR01-0.0/0.3	0	0.3	3/16/2009	**1.21**	**8.38** J	**16.7** J	**96**	**0.26**	**160**	**25**	**6.3**	**2.8**		**410**	**0.54**	**100**	**2.3**	**10000**	**18000**	**460**	**2100**	**440** B	**0.26**	**0.23** BJ-	**0.62**	**7.5**	**68000**	**1.6** J-		**25**	**0**		**0**	**1**	**10.2**	**60.5**	**28.3**	
KR01	KR01-4.0/6.0	4	6	3/16/2009	**9.71**	**33.5**	**31.6**	**120**	**0.34**	**300**	**31**	**10**	**4.5**		**370**	**1.2**		**2.1**	**12000**	**20000**	**450**	**2500**	830 BU	**0.36**	**0.18** BJ-	**0.73**		**53000** LJ	**3.8**	**26000** J	**27**	**9.5**		**4**	**6.9**	**9**	**33.2**	**37.5**	
KR01	KR01-8.0/10.0	8	10	3/16/2009	**52.2**	**59.2**	**41**	**270**	**0.67**	**170**	**22**	**12**	**3**		**280**	**0.63**		**2.7**	**8500**	**17000**	**440**	**1700**	820 BU	**0.46**	**0.29** BJ-	**0.72**		**63000** LJ	**17**	**23000** J	**14**	**17.5**		**3.6**	**8.8**	**16.5**	**26.9**	**26.6**	
KR02	KR02-0.0/0.3	0	0.3	3/16/2009	**0.882**	**10**	**19.7**	**90**	**0.23**	**180**	**27**	**6.4**	**2.8**		**440**	**0.75**	**100**	**2**	**9200**	**17000**	**480**	**1900**	**430** B	**0.28**	**0.24** BJ-	**0.73**	**8.2**	**67000**	**1.5**		**25**	**1.4**		**0.4**	**1**	**11.8**	**56.7**	**28.6**	
KR02	KR02-6.0/8.0	6	8	3/16/2009	**9.6**	**14.5**	**15.5**	**79**	**0.22**	**170**	**20**	**8.5**	**2.8**		**220**	**0.78**		**3**	**7200**	**11000**	**220**	**1500**	670 BU	**0.31**	**0.14** BJ-	**1.1**		**28000** LJ	**2.6**	**13000** J	**16**	**15.3**		**14.8**	**16.8**	**8.6**	**21.4**	**23.1**	
KR02	KR02-8.0/10.0	8	10	3/16/2009	**33.3**	**38.7**	**28.3**	**130**	**0.47**	**210**	**27**	**14**	**8.8**		**450**	**1.1**		**3.6**	**8500**	**15000**	**270**	**1700**	770 BU	**0.57**	**0.25** BJ-	**1.1**		**37000** LJ	**6.1**	**17000** J	**22**	**10.3**		**7**	**13.2**	**18.5**	**23.9**	**27.2**	
KR02	KR02-10.0/11.7	10	11.7	3/16/2009	**35.4**	**20.1**	**15.8**	**190**	**1**	**96**	**18**	**11**	**2.7**		**210**	**0.37**		**2.7**	**5400**	**14000**	**220**	**1000**	720 BU	**0.51**	**0.16** BJ-	**0.72**		**41000** LJ	**9.8**	**14000** J	**9.2**	**27.5**		**11.1**	**18.3**	**18.9**	**12.9**	**11.2**	
KR03	KR03-0.0/0.3	0	0.3	3/16/2009	**1.76**	**13.1** J	**22** J	**75**	**0.2**	**170**	**24**	**5.6**	**2.5**		**400**	**0.64**	**88**	**1.5**	**7700**	**15000**	**410**	**1600**	**390** B	**0.23**	**0.27** BJ-	**0.41**	**7**	**64000**	**1.4**		**22**	**0.8**		**0.5**	**1.4**	**18.3**	**58.3**	**20.7**	
KR03	KR03-6.0/8.0	6	8	3/16/2009	**36.6**	**26.3**	**26.1**	**130**	**0.34**	**210**	**26**	**13**	**6.6**		**410**	**1.1**		**2.5**	**9600**	**16000**	**310**	**1900**	790 BU	**0.5**	**0.18** BJ-	**0.74**		**36000** LJ	**5**	**17000** J	**20**	**1.2**		**3.8**	**14.6**	**21.1**	**27.8**	**31.6**	
KR03	KR03-10.0/12.0	10	12	3/16/2009	**286**	**82.2**	**56.5** J	**500**	**1.5**	**110**	**19**	**25**	**1.2**		**220**	**0.49**		**2.2**	**5900**	**16000**	**300**	**970**	850 BU	**0.88**	**0.43** J-	**0.75**		**75000** LJ	**15**	**14000** J	0.85 U	**0**		**2.5**	**10.8**	**24.2**	**42**	**20.6**	
KR04	KR04-0.0/0.3	0	0.3	3/16/2009	**0.564**	**5.26**	**11.4**	**98**	**0.39**	**180**	**30**	**7.3**	**3.2**		**510**	**0.71**	**110**	**1.1** B	**13000**	**22000**	**450**	**2600**	**460** B	**0.31**	**0.21** BJ-	**0.65**	**9**	**68000**	**2.8**		**29**	**0**		**0**	**0.2**	**1**	**61.6**	**37.2**	
KR04	KR04-6.0/8.0	6	8	3/16/2009	**10.6**	**41.3**	**53.6**	**1100**	**0.48**	**1000**	**40**	**15**	**17**		**1200**	**2.1**		**2.6**	**16000**	**25000**	**810**	**3200**	930 BU	**0.47**	**0.6** J-	**1.3**		**57000** LJ	**2.5**	**30000** J	**12**	**0**		**0.2**	**0.4**	**1.6**	**50.6**	**47.2**	
KR04	KR04-10.0/13.0	10	13	3/16/2009	**7.32**	**22.1**	**30**	**160**	**0.75**	**380**	**40**	**13**	**6.9**		**520**	**1.9**		**1.9**	**17000**	**27000**	**470**	**3400**	910 BU	**0.43**	**0.23** BJ-	**1**		**55000** LJ	**4.1**	**28000** J	**32**	**0**		**0**	**0.4**	**1.5**	**36.8**	**61.3**	
KKR-22-001	MK-KKR-22-001-0.0/1.0	0	1	11/8/2022	**0.45**	**4.7**	**8.2**	**42** J	**0.084**	**130**	**15**	**8.2**	**1.1**	**69**	**250**																									
KKR-22-001	MK-KKR-22-001-1.0/2.0	1	2	11/8/2022	**0.33**	**16**	**24**	**41** J	**0.075**	**120**	**15**	**4.1**	**1**	**45**	**190**																								
KKR-22-001	MK-KKR-22-001-2.0/3.0	2	3	11/8/2022	**1.2**	**15**	**14**	**97** J	**0.16**	**560**	**21**	**7.9**	**2.8**	**73**	**380**																								
KKR-22-001	MK-KKR-22-001-5.0/6.0	5	6	11/8/2022	**2.6**	**13**	**15**	**120**	**0.2**	**330**	**24**	**6.4**	**2.7**	**95**	**440**																								
KKR-22-001	MK-KKR-22-001-6.0/7.0	6	7	11/8/2022	**7.8**	**12**	**12**	**140** J	**0.27**	**190**	**15**	**11**	**3**	**64**	**300**																								
KKR-22-001	MK-KKR-22-001-7.0/8.1	7	8.1	11/8/2022	**31** J-	**19** J-	**13** J-																														
KKR-22-001	MK-KKR-22-001-10.0/11.0	10	11	11/8/2022	**0.85** J-	**0.65** J-	**0.91** J-																														
KKR-22-001	MK-KKR-22-001-11.0/12.0	11	12	11/8/2022	**0.013** J-	**0.021** J-	**0.016** J-																														
KKR-22-001	MK-KKR-22-001-12.0/13.0	12	13	11/8/2022	**0.013** J-	**0.02** J-	**0.012** J-																														
KKR-22-001	MK-KKR-22-001-13.0/13.7	13	13.7	11/8/2022	**0.013** J-	**0.014** J-	**0.013** J-																														
KKR-22-002	MK-KKR-22-002-0.0/1.0	0	1	11/8/2022	**0.9**	**4.4**	**9.9**	**130** J	**0.26**	**320**	**31**	**8.2**	**3.5**	**150**	**520**																								
KKR-22-002	MK-KKR-22-002-1.0/2.0	1	2	11/8/2022	**3.4**	**22**	**29**	**340** J	**0.42**	**610**	**34**	**13**	**7.5**	**130**	**700**																								
KKR-22-002	MK-KKR-22-002-2.0/3.0	2	3	11/8/2022	**25**	**18**	**25**	**770** J	**0.76**	**420**	**38**	**30**	**16**	**200**	**980**																								
KKR-22-002	MK-KKR-22-002-3.0/3.8	3	3.8	11/8/2022	**9.4**	**21**	**18**	**540** J	**1.2**	**240**	**13**	**10**	**3.6**	**77**	**220**																								
KKR-22-002	MK-KKR-22-002-5.0/6.0	5	6	11/8/2022	**14**	**3.3**	**2.5**	**32** J	**0.39**	**170**	**14**	**8.1**	**1.1**	**85**	**180**																								
KKR-22-003	MK-KKR-22-003-0.0/1.0	0	1	11/8/2022	**4**	**16**	**20**	**250** J	**0.4**	**660**	**40**	**11**	**5.3**	**170**	**680**																								
KKR-22-003	MK-KKR-22-003-1.0/2.0	1	2	11/8/2022	**12**	**17**	**28**	**1200** J	**1.1**	**3600** J	**34**	**33**	**24**	**280**	**##**																								
KKR-22-003	MK-KKR-22-003-2.0/3.1	2	3.1	11/8/2022	**24**	**36**	**35**	**11000** J	**1.1**	**470** J	**38**	**35**	**5**	**230**	**430**																								
KKR-22-003	MK-KKR-22-003-5.0/6.0	5	6	11/8/2022	**15**	**17**	**13**	**10000** J	**1.4**	**270**	**21**	**33**	**4.4**	**230**	**350**																								
KKR-22-003	MK-KKR-22-003-6.0/7.0	6	7	11/8/2022	**11**	**21**	**18**	**3100** J	**0.7**	**210**	**16**	**23**	**1.8**	**150**	**280**																								
KKR-22-003	MK-KKR-22-003-7.0/8.0	7	8	11/8/2022	**12** J-	**26** J-	**17** J-	**370** J	**0.54** J-	**160**	**15**	**20**	**1.1**	**81**	**210**																								
KKR-22-003	MK-KKR-22-003-10.0/11.0	10	11	11/8/2022	**3.6** J-	**2.4** J-	**1.7** J-	**27** J	**0.25** J-	**57** J-	**11**	**5.7** J	**0.65** J	**30** ::	**89**																								
KKR-22-003	MK-KKR-22-003-11.0/12.0	11	12	11/8/2022	**0.027** J-	**0.044** J-	**0.03** J-	**6.4** J	**0.012** J-	**3.2**	**7.2**	**2.5**	**0.2** J	**8**	**30**																								
KKR-22-003	MK-KKR-22-003-12.0/13.0	12	13	11/8/2022	**0.011** J-	**0.13** J-	**0.24** J-	**11** J	**0.014** J-	**5**	**11**	**2.6**	**0.21** J	**12**	**42**																								
KKR-22-003	MK-KKR-22-003-13.0/14.0	13	14	11/8/2022	**0.016** J-	**0.038** J-	**0.026** J-	**11** J	**0.015** J-	**5.1**	**11**	**2.4**	**0.23** J	**12**	**46**																								
KKR-22-004	MK-KKR-22-004-0.0/1.0	0	1	11/9/2022	**0.56**	**4**	**9.7**	**97** J	**0.2**	**210**	**26**	**8.2**	**2.8**	**160**	**540**																								

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

					PCB										PAH												
Analyte Group					PCB										PAH												
Analyte					Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b)-fluoranthene	Benzo(e) pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
WI CBSQG PE					1										22.8												
WI CBSQG PEC					3										68.4												
WI CBSQG PEC					5										114												
TSCA					50																						
Location code	Sample ID	Start Depth	End Depth	Date	Total PCB	Aroclor 1260	Aroclor 1254	Aroclor 1268	Aroclor 1221	Aroclor 1232	Aroclor 1248	Aroclor 1016	Aroclor 1262	Aroclor 1242	Total PAH	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)-fluoranthene	Benzo(e)pyrene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-Cd)Pyrene
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
KKR-22-004	MK-KKR-22-004-1.0/2.0	1	2	11/9/2022	**13.4**	**3.4 J**	**5.6 J**	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	**4.4 J**	**117.27**	**0.5**	**0.69**	**0.61**	**2.7**	**7.5**	**8.9**	**13**	**6**	**6.4**	**3.4**	**9.7**	**1.3**	**21**	**1.1**	**8.6**
KKR-22-004	MK-KKR-22-004-2.0/3.0	2	3	11/9/2022	**14.5**	**2.6 J**	**4.6 J**	1.2 U	1.5 U	1.2 U	1.2 U	1.2 U	1.2 U	**7.3 J**	**267.36**	**0.96**	**2.4**	**1.2**	**9**	**17**	**17**	**28**	**12**	**13**	**8.4**	**18**	**2.9**	**51**	**3.3**	**16**
KKR-22-004	MK-KKR-22-004-3.0/3.9	3	3.9	11/9/2022	**59.9**	**7.9**	**16**	2.3 U	3.1 U	2.3 U	2.3 U	2.3 U	2.3 U	**36 J**	**185.5**	**1.4**	**1.4**	**0.9**	**6.1**	**12**	**12**	**20**	**9.3**	**9.5**	**6.8**	**14**	**2.5**	**34**	**2.1**	**12**
KKR-22-004	MK-KKR-22-004-5.0/6.0	5	6	11/9/2022	**0.35**	**0.07 J**	**0.16 J**	0.14 U	0.18 U	0.14 U	0.14 U	0.14 U	0.14 U	**0.12 J**	**96.73**	**3.5**	**1.7**	**0.73**	**5.3**	**6.3**	**4.7**	**6.4**	**3**	**2.6**	**2**	**5.9**	**0.8**	**14**	**2.4**	**3.4**
KKR-22-004	MK-KKR-22-004-6.0/7.0	6	7	11/9/2022	0.9 U	1.3 U	1.3 U	1.3 U	1.8 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**126.39**	**4.8**	**2.7**	**1.3**	**6.8**	**8.1**	**5.2**	**8.8**	**3.6**	**3.1**	**2.2**	**6.7**	**0.99**	**16**	**4**	**3.1**
KKR-22-004	MK-KKR-22-004-7.0/8.0	7	8	11/9/2022	0.85 U	1.3 U	1.3 U	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**149**	**5**	**3.2**	**1.1**	**8.1**	**10**	**7.9**	**13**	**5.1**	**4.1**	**2.8**	**8.2**	**1.2**	**19**	**4.2**	**4.1**
KKR-22-004	MK-KKR-22-004-8.0/8.8	8	8.8	11/9/2022	0.9 U	1.4 U	1.4 U	1.4 U	1.8 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	**226.1**	**7.6**	**5.4**	**1.5**	**14**	**16**	**11**	**17**	**6.6**	**5.5**	**4.3**	**13**	**1.9**	**32**	**6.7**	**5.6**
KKR-22-004	MK-KKR-22-004-10.0/11.0	10	11	11/9/2022	1.05 U	1.5 U	1.5 U	1.5 U	2.1 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	**201.4**	**10**	**6.3**	**1.5**	**11**	**12**	**7.2**	**12**	**4.6**	**4.2**	**2.9**	**8.9**	**1.3**	**25**	**7.3**	**4.2**
KKR-22-005	MK-KKR-22-005-0.0/1.0	0	1	11/9/2022	**25.8**	**7.1 J**	**13 J**	0.73 U	0.98 U	0.73 U	0.73 U	0.73 U	0.73 U	**5.7 J**	**87.14**	**0.66**	**0.68**	**0.7**	**2**	**6.1**	0.61 U	**11**	**5.1**	**5.7**	**3.4**	**7.2**	**1.3**	**15**	**0.89**	**7.3**
KKR-22-005	MK-KKR-22-005-1.0/2.0	1	2	11/9/2022	**135**	**25**	**69 J**	2.6 U	3.4 U	2.6 U	2.6 U	2.6 U	2.6 U	**41 J**	**273.6**	**2.7**	**5.7**	**2.1**	**12**	**17**	**15**	**24**	**11**	**12**	**8.5**	**19**	**3**	**48**	**5.2**	**15**
KKR-22-005	MK-KKR-22-005-2.0/2.5	2	2.5	11/9/2022	**221**	**39**	**130 J**	6.6 U	8.8 U	6.6 U	6.6 U	6.6 U	6.6 U	**52 J**	**228.9**	**2.2**	**2.6**	**2**	**8.6**	**15**	**13**	**25**	**11**	**9.1**	**6.3**	**18**	**2.7**	**38**	**3.4**	**11**
KKR-22-005	MK-KKR-22-005-5.0/6.0	5	6	11/9/2022	**63.4**	**9.4**	**41 J**	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	**13 J**	**204.4**	**2.9**	**1.5**	**2.3**	**7.2**	**13**	**11**	**20**	**9.5**	**8.9**	**6.2**	**15**	**2.5**	**37**	**2.4**	**11**
KKR-22-005	MK-KKR-22-005-6.0/7.0	6	7	11/9/2022	**6.96**	**1.3**	**5.4 J**	0.15 U	0.21 U	0.15 U	0.15 U	0.15 U	0.15 U	**0.26 J**	**204.2**	**3.4**	**1.9**	**2.5**	**9.4**	**14**	**11**	**17**	**8.1**	**6.8**	**5.5**	**15**	**2.1**	**35**	**3.8**	**8.7**
KKR-22-005	MK-KKR-22-005-7.0/8.0	7	8	11/9/2022	1.4 U	2.1 U	2.1 U	2.1 U	2.8 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	**252.1**	**8.9**	**3.7**	**2.6**	**10**	**18**	**14**	**25**	**9.4**	**7.6**	**6.5**	**17**	**2.6**	**34**	**5.1**	**7.7**
KKR-22-005	MK-KKR-22-005-10.0/11.0	10	11	11/9/2022	**0.467**	**0.13 J**	**0.25 J**	3.1 U	4.1 U	3.1 U	3.1 U	3.1 U	3.1 U	**0.087 J**	**163.5**	**11**	**4.8**	**1.3**	**6.9**	**10**	**6.9**	**11**	**4.5**	**3.8**	**3.4**	**8.7**	**1.1**	**21**	**5.1**	**4**
KKR-22-005	MK-KKR-22-005-11.0/12.0	11	12	11/9/2022	1.85 U	2.8 U	2.8 U	2.8 U	3.7 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	**170.8**	**13**	**5.4**	**1.4**	**6.9**	**11**	**7.3**	**11**	**4.5**	**4**	**2.8**	**8.4**	**1.2**	**21**	**6.9**	**4**
KKR-22-005	MK-KKR-22-005-12.0/13.0	12	13	11/9/2022	1.3 U	2 U	2 U	2 U	2.6 U	2 U	2 U	2 U	2 U	2 U	**133.5**	**8.9**	**3.5**	**1.4**	**5**	**9**	**5.8**	**8.9**	**4.1**	**3.2**	**2.5**	**7.7**	**1.1**	**16**	**4.1**	**3.3**
KKR-22-006	MK-KKR-22-006-0.0/1.3	0	1.3	11/9/2022	**183**	**59 J**	**70 J**	8.5 U	11 U	8.5 U	8.5 U	8.5 U	8.5 U	**54 J**	**204.2**	**1.3**	**2.4**	**1.2**	**4.6**	**17**	**14**	**25**	**12**	**10**	**7.5**	**16**	**2.8**	**36**	**2.7**	**13**
KKR-22-007	MK-KKR-22-007-0.0/1.0	0	1	11/9/2022	**3.14**	**0.83 J**	**1.4 J**	0.15 U	0.2 U	0.15 U	0.15 U	0.15 U	0.15 U	**0.91 J**	**57.14**	**0.17**	**0.2**	**0.39**	**1**	**3.5**	**4.3**	**8.1**	**3.8**	**4**	**2.5**	**4.6**	**0.84**	**8.4**	**0.33**	**5**
KKR-22-007	MK-KKR-22-007-1.0/2.0	1	2	11/9/2022	**18.8**	**2.8 J**	**6 J**	1.2 U	1.5 U	1.2 U	1.2 U	1.2 U	1.2 U	**10 J**	**180.98**	**1.2**	**1.8**	**0.98**	**6.2**	**11**	**11**	**19**	**8.5**	**8.7**	**6.3**	**13**	**2.3**	**34**	**2.5**	**11**
KKR-22-007	MK-KKR-22-007-5.0/6.0	5	6	11/9/2022	**36.2**	**7.2 J**	**16 J**	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	**13 J**	**186.6**	**2**	**1.5**	**1.3**	**6.7**	**13**	**11**	**19**	**8.4**	**7.4**	**5.8**	**14**	**2.2**	**34**	**2.6**	**9.6**
KKR-22-007	MK-KKR-22-007-6.0/7.0	6	7	11/9/2022	**32.4**	**5.1 J**	**22 J**	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	**5.3 J**	**168.9**	**2.4**	**1.5**	**1.9**	**6.6**	**10**	**9.2**	**15**	**7.1**	**5.8**	**5.9**	**12**	**2**	**28**	**2.5**	**8**
KKR-22-007	MK-KKR-22-007-7.0/8.2	7	8.2	11/9/2022	**1.81**	**0.61 J**	**1.2 J**	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**310.7**	**3.2**	**2.1**	**5.8**	**11**	**27**	**20**	**29**	**14**	**11**	**8.9**	**21**	**2.9**	**47**	**2.8**	**15**
KKR-22-007	MK-KKR-22-007-10.0/11.0	10	11	11/9/2022	0.7 U	1.1 U	1.1 U	1.1 U	1.4 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**226.2**	**4.5**	**1.7**	**2.2**	**8.6**	**14**	**10**	**18**	**7.4**	**5.7**	**4.4**	**13**	**1.9**	**27**	**3.6**	**5.2**
KKR-22-007	MK-KKR-22-007-11.0/12.0	11	12	11/9/2022	0.7 U	1.1 U	1.1 U	1.1 U	1.4 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**263.5**	**3.7**	**1.8**	**5.4**	**9.8**	**19**	**16**	**25**	**11**	**9.1**	**7.1**	**19**	**3.2**	**32**	**5.4**	**11**
KKR-22-007	MK-KKR-22-007-12.0/13.0	12	13	11/9/2022	0.7 U	1.1 U	1.1 U	1.1 U	1.4 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	**273.2**	**4.7**	**2.1**	**3.5**	**11**	**17**	**13**	**21**	**9.3**	**7.5**	**6.1**	**18**	**2.7**	**33**	**5.8**	**9.5**
KKR-22-007	MK-KKR-22-007-13.0/14.2	13	14.2	11/9/2022	0.7 U	1 U	1 U	1 U	1.4 U	1 U	1 U	1 U	1 U	1 U	**295.3**	**5.3**	**2.2**	**4.1**	**11**	**18**	**14**	**21**	**9.5**	**7.8**	**7.6**	**19**	**2.7**	**35**	**6.3**	**9.8**
KKR-22-008	MK-KKR-22-008-0.0/1.0	0	1	11/9/2022	**19.9**	**6.1 J**	**9.1 J**	1.4 U	1.8 U	1.4 U	1.4 U	1.4 U	1.4 U	**4.7 J**	**71.94**	**0.29**	**0.3**	**0.49**	**1.4**	**4.8**	**5.3**	**9.4**	**4.4**	**4.6**	**3**	**4.9**	**1.1**	**11**	**0.47**	**5.8**
KKR-22-008	MK-KKR-22-008-1.0/2.0	1	2	11/9/2022	**14.3**	**3.6 J**	**6.4 J**	1.2 U	1.7 U	1.2 U	1.2 U	1.2 U	1.2 U	**4.3 J**	**127.16**	**1.1**	**1.9**	**0.86**	**4.8**	**8**	**7.9**	**13**	**6.1**	**5.9**	**4.5**	**8.8**	**1.7**	**22**	**1.9**	**7.4**
KKR-22-008	MK-KKR-22-008-2.0/2.7	2	2.7	11/9/2022	**124**	**31 J**	**57**	6 U	8 U	6 U	6 U	6 U	6 U	**36 J**	**176.19**	**0.99**	**1.5**	**1.2**	**6.3**	**13**	**11**	**19**	**8.6**	**8.3**	**6.5**	**12**	**2.5**	**32**	**2.1**	**11**
KKR-22-008	MK-KKR-22-008-5.0/6.0	5	6	11/9/2022	**34.3**	**5.4 J**	**23 J**	1.1 U	1.5 U	1.1 U	1.1 U	1.1 U	1.1 U	**5.9 J**	**185.4**	**3.1**	**1.6**	**2.1**	**7**	**10**	**9.5**	**16**	**7.6**	**6.4**	**5.2**	**12**	**2.1**	**29**	**2.7**	**8.1**
KKR-22-008	MK-KKR-22-008-6.0/7.0	6	7	11/9/2022	**26**	**5.9 J**	**18 J**	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	**2.1 J**	**193.9**	**3.5**	**2.3**	**2.6**	**7.3**	**13**	**10**	**17**	**8.3**	**7.1**	**5.6**	**13**	**2.2**	**31**	**3.1**	**8.9**
KKR-22-008	MK-KKR-22-008-7.0/7.8	7	7.8	11/9/2022	0.85 U	1.3 U	1.3 U	1.3 U	1.7 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	**283.1**	**4.6**	**1.8**	**5.1**	**11**	**21**	**18**	**27**	**12**	**11**	**8.2**	**21**	**3.4**	**39**	**4**	**14**
KKR-22-008	MK-KKR-22-008-10.0/11.0	10	11	11/9/2022	1.2 U	1.8 U	1.8 U	1.8 U	2.4 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	**258**	**5**	**2.9**	**3.5**	**11**	**20**	**15**	**22**	**9.9**	**8.7**	**5.8**	**19**	**2.7**	**37**	**5.5**	**11**
KKR-22-008	MK-KKR-22-008-11.0/12.0	11	12	11/9/2022	1.5 U	2.3 U	2.3 U	2.3 U	3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	**286.7**	**7.8**	**6.2**	**2.2**	**17**	**16**	**12**	**17**	**7.2**	**6.6**	**4.2**	**16**	**1.9**	**40**	**10**	**6.6**
KKR-22-008	MK-KKR-22-008-12.0/13.2	12	13.2	11/9/2022	1.65 U	2.5 U	2.5 U	2.5 U	3.3 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**280.8**	**9**	**7.1**	**3.2**	**17**	**16**	**11**	**14**	**6.6**	**5.8**	**4.2**	**14**	**1.8**	**40**	**12**	**6.1**

Appendix A
Kinnickinnic River Sediment Analytical Results Summary
Focused Feasibility Study, Milwaukee Estuary AOC, Milwaukee, Wisconsin

Analyte Group								Metals							Metals																		Physical Parameters									
Analyte					Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
Unit					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
WI CBSQG PE								110	1.1	130	49	33	5	150	460					40000	1100			25																
WI CBSQG PEC								330	3.3	390	147	99	15	450	1380					120000	3300			75																
WI CBSQG PEC								550	5.5	650	245	165	25	750	2300					200000	5500			125																
TSCA																																								
Location code	Sample ID	Start Depth	End Depth	Date	Naphthalene	Phenanthrene	Pyrene	Chromium	Mercury	Lead	Nickel	Arsenic	Cadmium	Copper	Zinc	Silver	Barium	Selenium	Aluminum	Iron	Manganese	Potassium	Sodium	Thallium	Antimony	Beryllium	Cobalt	Calcium	Cyanide	Magnesium	Vanadium	TOC	Gravel	Sand	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Fines
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	%	%	%	%	%
KKR-22-004	MK-KKR-22-004-1.0/2.0	1	2	11/9/2022	0.97	8.9	16	150 J	0.25	360	27	8.1	3.7	130	570																									
KKR-22-004	MK-KKR-22-004-2.0/3.0	2	3	11/9/2022	1.2	27	39	960	0.42	1000	32	13	10	130	950 ::																									
KKR-22-004	MK-KKR-22-004-3.0/3.9	3	3.9	11/9/2022	2.5	15	24	180 J	0.51	620	32	13	6.3	110	650																									
KKR-22-004	MK-KKR-22-004-5.0/6.0	5	6	11/9/2022	11	12	11	10000	1.5	570	18	18	2.6	130	240																									
KKR-22-004	MK-KKR-22-004-6.0/7.0	6	7	11/9/2022	18	18	13	11000 J	1.4 J-	250	22	63	5.8	140	300																									
KKR-22-004	MK-KKR-22-004-7.0/8.0	7	8	11/9/2022	16	21	15	7500 J	1.3 J-	240	19	43	5.4	120	280																									
KKR-22-004	MK-KKR-22-004-8.0/8.8	8	8.8	11/9/2022	18	36	24	2300 J	1.4 J-	200	15	33	2.8	110	230																									
KKR-22-004	MK-KKR-22-004-10.0/11.0	10	11	11/9/2022	31	33	19	13000 J	3.3 J-	550	17	50	2.9	200	300																									
KKR-22-005	MK-KKR-22-005-0.0/1.0	0	1	11/9/2022	1.5	5.3	13	200	0.3	330	31	11	4.4	180	650																									
KKR-22-005	MK-KKR-22-005-1.0/2.0	1	2	11/9/2022	7.4	26	40	500	0.7	650	42	15	9.6	230	910																									
KKR-22-005	MK-KKR-22-005-2.0/2.5	2	2.5	11/9/2022	12	18	31	470	0.65	540	45	19	9.4	290	860																									
KKR-22-005	MK-KKR-22-005-5.0/6.0	5	6	11/9/2022	16	14	24	380	0.84	440	33	22	8.9	230	760																									
KKR-22-005	MK-KKR-22-005-6.0/7.0	6	7	11/9/2022	14	20	26	5200	1.3	810	26	28	6.5	270	900																									
KKR-22-005	MK-KKR-22-005-7.0/8.0	7	8	11/9/2022	26	27	27	16000 J	2.4 J-	2200	43	83	6.8	470	1800																									
KKR-22-005	MK-KKR-22-005-10.0/11.0	10	11	11/9/2022	15	27	18	19000 J	2 J-	1600	44	110	2.9	560	1500																									
KKR-22-005	MK-KKR-22-005-11.0/12.0	11	12	11/9/2022	18	27	17	13000 J	2.8 J-	1400	44	120	5.2	540	1300																									
KKR-22-005	MK-KKR-22-005-12.0/13.0	12	13	11/9/2022	17	18	14	24000 J	2.8 J-	510	52	110	12	320	400																									
KKR-22-006	MK-KKR-22-006-0.0/1.3	0	1.3	11/9/2022	5.5	5.2	28	450	0.44	590	48	25	12 ::	310	1300 ::																									
KKR-22-007	MK-KKR-22-007-0.0/1.0	0	1	11/9/2022	0.41	2.9	6.7	70	0.2	140	21	7.4	1.8	130	420																									
KKR-22-007	MK-KKR-22-007-1.0/2.0	1	2	11/9/2022	2.5	16	25	440	0.37	530	27	10	5.9	160	650																									
KKR-22-007	MK-KKR-22-007-5.0/6.0	5	6	11/9/2022	7.1	16	25	280	0.45	470	31	15	8	130	560																									
KKR-22-007	MK-KKR-22-007-6.0/7.0	6	7	11/9/2022	16	14	21	250	0.59	410	33	19	10	150	600																									
KKR-22-007	MK-KKR-22-007-7.0/8.2	7	8.2	11/9/2022	34	19	37	470	1.4	390	25	43	42	190	1500																									
KKR-22-007	MK-KKR-22-007-10.0/11.0	10	11	11/9/2022	61	17	21	1400 J	1.1 J-	1100	23	30	5.1	120	610																									
KKR-22-007	MK-KKR-22-007-11.0/12.0	11	12	11/9/2022	45	15	25	570 J	1.8 J-	370	20	31	3.8	120	590																									
KKR-22-007	MK-KKR-22-007-12.0/13.0	12	13	11/9/2022	63	20	26	860 J	1.6 J-	340	20	23	3	120	520																									
KKR-22-007	MK-KKR-22-007-13.0/14.2	13	14.2	11/9/2022	76	19	27	1800 J	1.5 J-	380	25	28	2.9	120	610																									
KKR-22-008	MK-KKR-22-008-0.0/1.0	0	1	11/9/2022	0.49	4.2	10	150	0.25	250	30	14	6.8	230	800																									
KKR-22-008	MK-KKR-22-008-1.0/2.0	1	2	11/9/2022	2.4	9.9	19	670	0.38	640	32	12	6.9	150	770																									
KKR-22-008	MK-KKR-22-008-2.0/2.7	2	2.7	11/9/2022	3.2	13	24	330	0.57	610	38	15	9.1	160	780																									
KKR-22-008	MK-KKR-22-008-5.0/6.0	5	6	11/9/2022	28	13	22	300	0.8	400	29	23	10	170	720																									
KKR-22-008	MK-KKR-22-008-6.0/7.0	6	7	11/9/2022	23	13	23	730	1.3	500	34	42	28	290	1600																									
KKR-22-008	MK-KKR-22-008-7.0/7.8	7	7.8	11/9/2022	31	19	32	1300	0.46 J-	620 J	30 J	52	49 J	360 J	2100 J																									
KKR-22-008	MK-KKR-22-008-10.0/11.0	10	11	11/9/2022	25	23	31	8600 J	1.2 J-	800	27	47	4.2	260	820																									
KKR-22-008	MK-KKR-22-008-11.0/12.0	11	12	11/9/2022	27	54	35	46000 J	2.2 J-	3000	41	180	3.2	560	870																									
KKR-22-008	MK-KKR-22-008-12.0/13.2	12	13.2	11/9/2022	28	52	33	57000	3.8 J-	7400 J	21 J	120 ::	8.8 J	420 J	740 J																									

Notes:
Wisconsin Consensus-based Sediment Quality Guidelines (WI CBSQG) Probable Effects Concentrations (PECs) or PCB threshold levels are used for comparative purposes to evaluate the data
Aroclors and total PCBs from Solvay Coke RI Report not included due to discrepancies in source data
Blue shading = results greater than 1 mg/kg PCB threshold level or greater than PEC
Gold shading = results greater than 3 mg/kg PCB threshold level or 3x PEC
Orange shading = results greater than 5 mg/kg PCB threshold level or 5x PEC
Pink shading = results greater than TSCA concentration (50 mg/kg)
a blank cell for a given sample location for a given analyte or test means that the analysis or test has not been completed at the indicated sample location
Italicized locations and sample IDs are upstream of project area
ID = identification
J = Estimated
mg/kg = milligram(s) per kilogram
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
R = rejected
TOC = total organic carbon
TSCA = Toxic Substances Control Act
U = Nondetect

Appendix B
Technical Memorandum: Focused List of Metals to Delineate the Nature and Extent of Sediment Contamination

Jacobs

Appendix B
Technical Memorandum

Subject	**Focused List of Metals to Delineate the Nature and Extent of Sediment Contamination**
Project Name	Milwaukee Estuary Area of Concern, City of Milwaukee, Milwaukee County, Wisconsin Task Order 68HE0520F0069, Contract No. 68HE0519D00007
From	Jacobs
Date	October 20, 2022

1. Introduction

This technical memorandum presents the rationale for using a focused list of metals (chromium [Cr], lead [Pb], and mercury [Hg]) along with total polychlorinated biphenyls (PCBs) and total polycyclic aromatic hydrocarbons (PAHs) to delineate the nature and extent of contamination and establish remedial target areas (RTAs) in the focused feasibility studies (FFSs) for the Milwaukee Estuary Area of Concern (AOC). The work herein was completed for the U.S. Environmental Protection Agency (EPA) Great Lakes National Program Office by Jacobs[1], in accordance with Task Order 68HE0520F0069 under Contract No. 68HE0519D00007. Jacobs is preparing FFS documents for in-channel sediment for the Milwaukee River Downtown Reach and for portions of three additional project areas including the South Menomonee Canal, the Kinnickinnic (KK) River, and the Milwaukee Bay (MKE Bay). The data from these project areas and two additional project areas (Menomonee River and Milwaukee River Third Ward) were evaluated (Figure 1). Data from the Floodplains Reach Project Area are not included in this memorandum because a different approach was used to describe the nature and extent of contamination and delineate RTAs.

2. Data Evaluation Methods and Results

Previous documents prepared for the Milwaukee Estuary AOC reported that a subset of metals tended to exhibit more exceedances relative to screening values. For example, the *Focused Feasibility Study Report, Menomonee and Milwaukee Rivers* (CH2M 2019a) reported that in the Menomonee River and in the downstream end of the Milwaukee River (currently referred to as the Downtown Reach Project Area), cadmium, chromium, lead and mercury frequently exceeded their respective Probable Effect Concentration (PEC)[2] values, and lead and chromium exhibited the greatest frequency and magnitude of exceedance. The *Site Characterization Report, Milwaukee River Downstream Sediments* documented that in the Milwaukee River Downtown Reach, chromium, lead, and mercury most frequently exceeded their respective PEC values (CH2M 2019b). The *100% Final Site Investigation Report, Characterization of Sediments in South Menomonee Canal* (Anchor QEA 2021) concluded that lead, chromium, and copper were the metals with the greatest number of PEC exceedances.

[1] On December 15, 2017, CH2M HILL Companies Ltd. and its subsidiaries including CH2M HILL, Inc. became part of Jacobs.

[2] PECs from the Wisconsin Consensus-based Sediment Quality Guidelines or PCB screening levels are used for comparative purposes to evaluate the data.

This evaluation considers the AOC-wide sediment FFS data set that covers six project areas. Metals with corresponding PECs included in the data set are chromium, mercury, lead, nickel, arsenic, cadmium, copper, zinc, iron, manganese, and antimony.

Iron, manganese, and antimony were not included in this analysis. Antimony was not widely analyzed, and where the data are available, the concentrations do not exceed the antimony PEC. Iron and manganese were not analyzed in all investigations; where analyzed, PEC exceedances were limited to seven samples in the KK River (Table 1). Five of the iron or manganese PEC exceedances were in surface sediment samples collected along the KK River shoreline during the Solvay Coke Remedial Investigation (Arcadis 2016); PAH concentrations also exceeded the PEC in four of these samples. The remaining two samples were collected by the U.S. Army Corps of Engineers as part of the 2020 investigation of the KK federal navigation channel and the exceedances occur at 5 to 7 feet and 9 to 11.4 feet below the sediment surface (bss).

The co-occurrence of what is termed herein as the five primary chemicals of concern (COCs) (total PCBs, total PAHs, chromium, mercury, and lead) and the other nonprimary metals (arsenic, cadmium, copper, nickel, and zinc) was evaluated using the following stepwise process:

1. An exceedance factor was calculated for each COC in each sample by dividing the COC concentration by the corresponding PEC or the 1 milligram per kilogram (mg/kg) threshold level for PCBs.
2. The maximum exceedance factor was selected for each sample for the nonprimary metals (arsenic, cadmium, copper, nickel, and zinc).
3. The maximum exceedance factor was selected for each sample for the primary metals (chromium, lead, and mercury).
4. The maximum exceedance factor for the nonprimary metals was plotted against the maximum exceedance factor for the primary metals for each sample (Figure 2).

The plot shown on Figure 2 is divided into four quadrants where gridlines representing exceedance factors of 1 for primary and nonprimary metals intersect:

- Upper left quadrant: Samples plotting in this quadrant have a PEC exceedance for a nonprimary metal, but not for a primary metal.
- Upper right quadrant: Samples plotting in this quadrant have co-located PEC exceedances for primary and nonprimary metals.
- Lower left quadrant: Samples plotting in this quadrant have no PEC exceedances for primary or nonprimary metals.
- Lower right quadrant: Samples plotting in this quadrant have a PEC exceedance for a primary metal but not for a nonprimary metal.

Information on Figure 2 illustrates that a relatively small number of samples fall into the upper left quadrant (approximately 40 samples out of nearly 2,500 samples included in this evaluation). These are samples where PEC exceedances of a nonprimary metal are not co-located with an exceedance of a primary metal.

The analysis was then expanded to also include total PAHs and total PCBs as follows:

1. The maximum exceedance factor was determined for the five primary COCs for each sample (chromium, lead, mercury, total PCBs, and total PAHs).
2. The maximum exceedance factor for the nonprimary metals was plotted against the maximum exceedance factor for the five primary COCs for each sample (Figure 3).

As shown on Figure 3, the addition of total PAHs and total PCBs to the analysis reduces the number of samples plotting in the upper left quadrant to six. These samples are summarized in Table 2. Nickel, cadmium, copper, or zinc nominally exceed the PEC in these samples, with exceedance factors ranging from approximately 1.1 to 1.3.

3. Conclusion

The evaluation presented in this memorandum demonstrates that designation of chromium, lead, and mercury as primary COCs (along with total PAHs and total PCBs) is an appropriate and protective means of delineating RTAs for each of the five sediment project areas within the Milwaukee Estuary AOC. PEC exceedances of nonprimary metals are either not significant within the AOC (iron and manganese) or are predominantly co-located with chromium, lead, or mercury PEC exceedances (arsenic, cadmium, copper, nickel, and zinc). When co-occurrence with total PCBs and total PAHs is also considered, there are only six samples with nonprimary metal PEC exceedances that are not co-located with a primary COC PEC or PCB threshold level exceedance, and the PEC exceedance factors in these cases are all less than two.

4. References

Anchor QEA. 2021. *100% Final Site Investigation Report, Characterization of Sediments in South Menomonee Canal, Milwaukee, Wisconsin.* Prepared for Wisconsin Department of Natural Resources and U.S. Environmental Protection Agency Great Lakes National Program Office; EPA GLRI Grant No. GL-00E02392. August.

ARCADIS. 2016. *Milwaukee Solvay Coke & Gas Site Remedial Investigation Report.* 311 East Greenfield Avenue, Milwaukee, WI. August.

CH2M HILL, Inc. (CH2M). 2019a. *Focused Feasibility Study Report, Menomonee and Milwaukee Rivers, Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin.* Prepared for U.S. Environmental Protection Agency Great Lakes National Program Office. Task Order No. 0029/Contract No. EP-R5-11-09. May.

CH2M HILL, Inc. (CH2M). 2019b. *Final Site Characterization Report, Milwaukee River Downstream Sediments, Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin.* Prepared for U.S. Environmental Protection Agency Great Lakes National Program Office. Task Order No. 0029/Contract No. EP-R5-11-09. December.

Tables

Table 1. Summary of Iron and Manganese Results Exceeding PECs

Milwaukee Estuary AOC, Milwaukee, Wisconsin

							PCB		PAH		Metals																	
						Analyte	Total PCB		Total PAH		Chromium		Mercury		Lead		Nickel		Arsenic		Cadmium		Copper		Zinc		Iron		Manganese		Antimony	
							mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
						WI CBSQG PEC	1		22.8		110		1.1		130		49		33		5		150		460		40000		1100		25	
						WI CBSQG PEC 3x	3		68.4		330		3.3		390		147		99		15		450		1380		120000		3300		75	
						WI CBSQG PEC 5x	5		114		550		5.5		650		245		165		25		750		2300		200000		5500		125	
						TSCA	50																							
Reach	Investigation	Location Code	Sample ID	Depth (feet)	End Depth (feet)	Date	Total PCB		Total PAH		Chromium		Mercury		Lead		Nickel		Arsenic		Cadmium		Copper		Zinc		Iron		Manganese		Antimony	
							mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Kinnickinnic River	Solvay Coke RI Report	P-3	P-3-0.0/0.0	0	0	11/7/2013			72.8		24		0.14	J	160						2.1				650		52000	J				
Kinnickinnic River	Solvay Coke RI Report	P-4	P-4-0.0/0.0	0	0	11/7/2013			37.7		23		0.42	J	51						2.6				410		100000	J				
Kinnickinnic River	Solvay Coke RI Report	P-1	P-1-0.0/0.0	0	0	11/7/2013			26.2		48		0.14	J	110						0.65				120		470000	J				
Kinnickinnic River	Solvay Coke RI Report	P-2	P-2-0.0/0.0	0	0	11/7/2013			32		250		1.1	J	1200						3.8				1000		450000	J				
Kinnickinnic River	Solvay Coke RI Report	P-4A	P-4A-0.0/0.0	0	0	11/7/2013			1.3		78		0.0062	J	3.5						0.043	J			13		400000	J				
Kinnickinnic River	2020 USACE KK River Navigation Channel	MKE-FNC09	MKE-NAV20-09-5-7	5	7	10/6/2020	0.25		2.3		120		0.49		260		24		9.1		4.1		58		310		98000		590			
Kinnickinnic River	2020 USACE KK River Navigation Channel	MKE-FNC45	MKE-NAV20-45-9-11.4	9	11.4	10/15/2020	0.005	U	0.0077		23		0.026	J	10		21		2.1		0.2		14		53		29000		1600			

Notes:

Wisconsin Consensus-based Sediment Quality Guidelines (WI CBSQG) Probable Effects Concentrations (PECs) or PCB threshold levels are used for comparative purposes to evaluate the data.

Aroclors and total PCBs from Solvay Coke RI Report not included due to discrepancies in source data

Blue shading = results greater than 1 mg/kg PCB screening level value or greater than PEC

Gold shading = results greater than 3 mg/kg PCB screening level value or 3x PEC

Orange shading = results greater than 5 mg/kg PCB screening level value or 5x PEC

Pink shading = results greater than TSCA concentration (50 mg/kg)

ID = identification

J = Estimated

KK = Kinnickinnic

mg/kg = milligram(s) per kilogram

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

R = rejected

RI = Remedial Investigation

TOC = total organic carbon

TSCA = Toxic Substances Control Act

U = Nondetect

USACE = United States Army Corps of Engineers

Table 2. Summary of Samples with Non-Co-Located Exceedances of Non-Primary Metals

Milwaukee Estuary AOC, Milwaukee, Wisconsin

							PCB		PAH		Metals															
						Analyte	Total PCB		Total PAH		Chromium		Mercury		Lead		Nickel		Arsenic		Cadmium		Copper		Zinc	
							mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
						WI CBSQG PEC	1		22.8		110		1.1		130		49		33		5		150		460	
						WI CBSQG PEC 3x	3		68.4		330		3.3		390		147		99		15		450		1380	
						WI CBSQG PEC 5x	5		114		550		5.5		650		245		165		25		750		2300	
						TSCA	50																			
Reach	Investigation	Location Code	Sample ID	Start Depth (feet)	End Depth (feet)	Date	Total PCB mg/kg		Total PAH mg/kg		Chromium mg/kg		Mercury mg/kg		Lead mg/kg		Nickel mg/kg		Arsenic mg/kg		Cadmium mg/kg		Copper mg/kg		Zinc mg/kg	
Kinnickinnic River	2021 WDNR FFS Data Gap	KKR-21-060	KKR-21-060-07-09-210820	7	9	8/20/2021	0.0025	U	**5.6**		**14.8**	J	**0.2**		**54.8**		**11**		**3.5**		**0.34**		**170**		**170**	
Kinnickinnic River	2020 WDNR Kinnickinnic Sediment Characterization	KKR-20-002	KKR-20-002-C-01-03-200916	1	3	9/16/2020	**0.062**		**20.8**		**20**	J-	**0.054**		**37**		**11**	J	**4.2**		**5.2**		**27**	J	**240**	
Kinnickinnic River	2020 USACE KK River Navigation Channel	MKE-FNC16	MKE-NAV20-16-00-01	0	1	10/5/2020	0.0065	U	**0.1**		**77**		0.027	U	**16**		**59**		**6.9**		**0.33**		**170**		**200**	
Menomonee River	2015 GLNPO Menomonee River Site Characterization	R5-11	MR-SD-R5-11-0.0/0.5	0	0.5	11/3/2015	**0.33**		**12.2**		**61.4**		**0.245**	J	**117**		**31.2**		**6.92**	J	2.69	U	**120**		**499**	
Milwaukee Bay	2020 WDNR Milwaukee Bay Sediment Characterization	MKE-20-108	MKE-20-108-C-00-01-200922	0	1	9/22/2020	**0.014**		**4.5**		**33**	J	**0.045**	J-	**30.8**		**52.5**		**10**		**0.34**		**86.5**		**123**	
South Menomonee Canal	2021 WDNR FFS Data Gap	SMC-21-007	SMC-21-007-00-01-210821	0	1	8/21/2021	0.0027	U	**0.23**		**11.9**		**0.033**		**10.8**		**74.5**		**2.9**		**0.3**		**18.6**		**64.2**	J

Notes:

Wisconsin Consensus-based Sediment Quality Guidelines (WI CBSQG) Probable Effects Concentrations (PECs) or PCB screening levels are used for comparative purposes to evaluate the data.

Blue shading = results greater than 1 mg/kg PCB screening level value or greater than PEC

Gold shading = results greater than 3 mg/kg PCB screening level value or 3x PEC

Orange shading = results greater than 5 mg/kg PCB screening level value or 5x PEC

Pink shading = results greater than TSCA concentration (50 mg/kg)

FFS = Focus Feasibility Study

GLNPO = Great Lakes National Program Office

ID = identification

J = Estimated

KK = Kinnickinnic

mg/kg = milligram(s) per kilogram

PAH = polycyclic aromatic hydrocarbon

PCB = polychlorinated biphenyl

R = rejected

TOC = total organic carbon

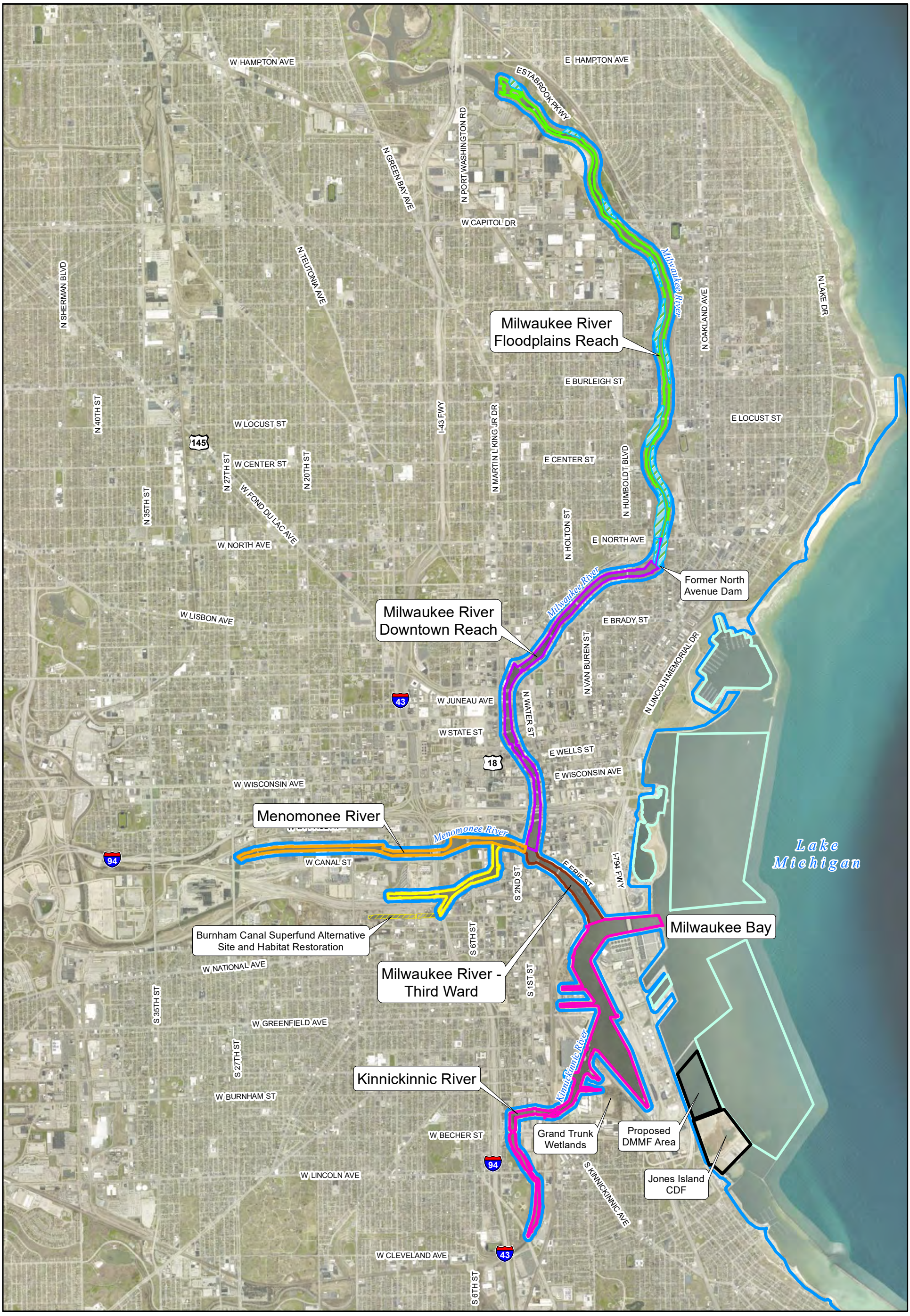
TSCA = Toxic Substances Control Act

U = Nondetect

USACE = United States Army Corps of Engineers

WDNR = Wisconsin Department of Natural Resources

Figures



LEGEND

- Floodplain Area Boundary
- Milwaukee Bay
- Menomonee River
- Kinnickinnic River
- Milwaukee River Downtown
- Milwaukee River Floodplain
- Milwaukee River - Third Ward
- South Menomonee Canal
- Greater Milwaukee GLLA Project Agreement boundary

N

0 1500 3000

Feet

Notes:
1. CDF = confined disposal facility; DMMF = dredged materials management facility; GLLA = Great Lakes Legacy Act
2. 2022 Aerial Photography provided by Esri ArcGIS Online World Imagery.

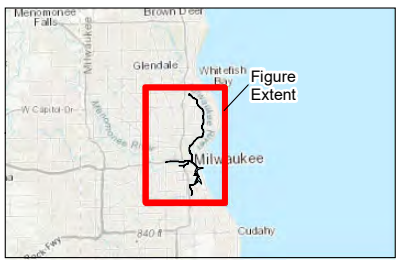
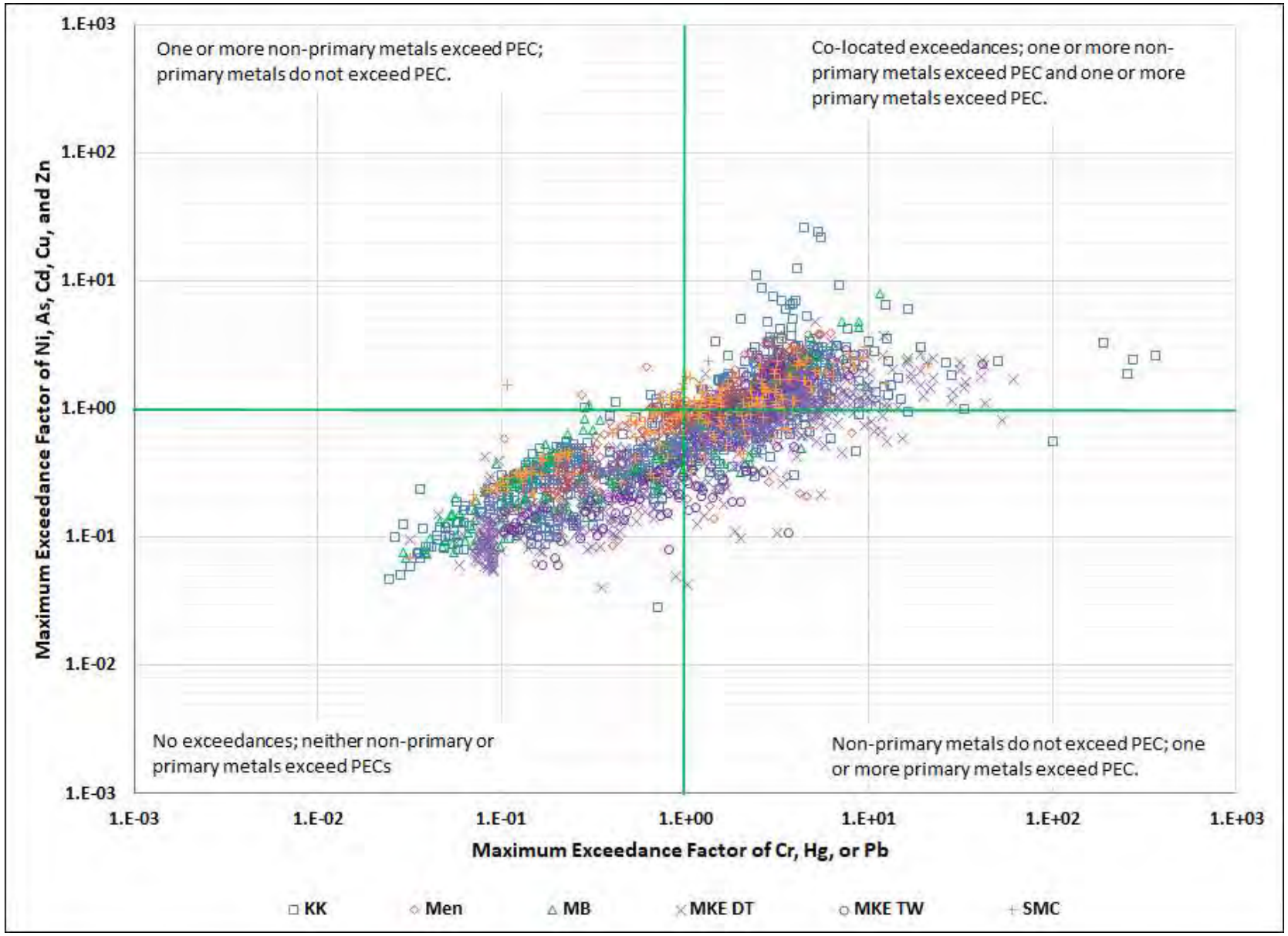


Figure 1
Regional Features
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

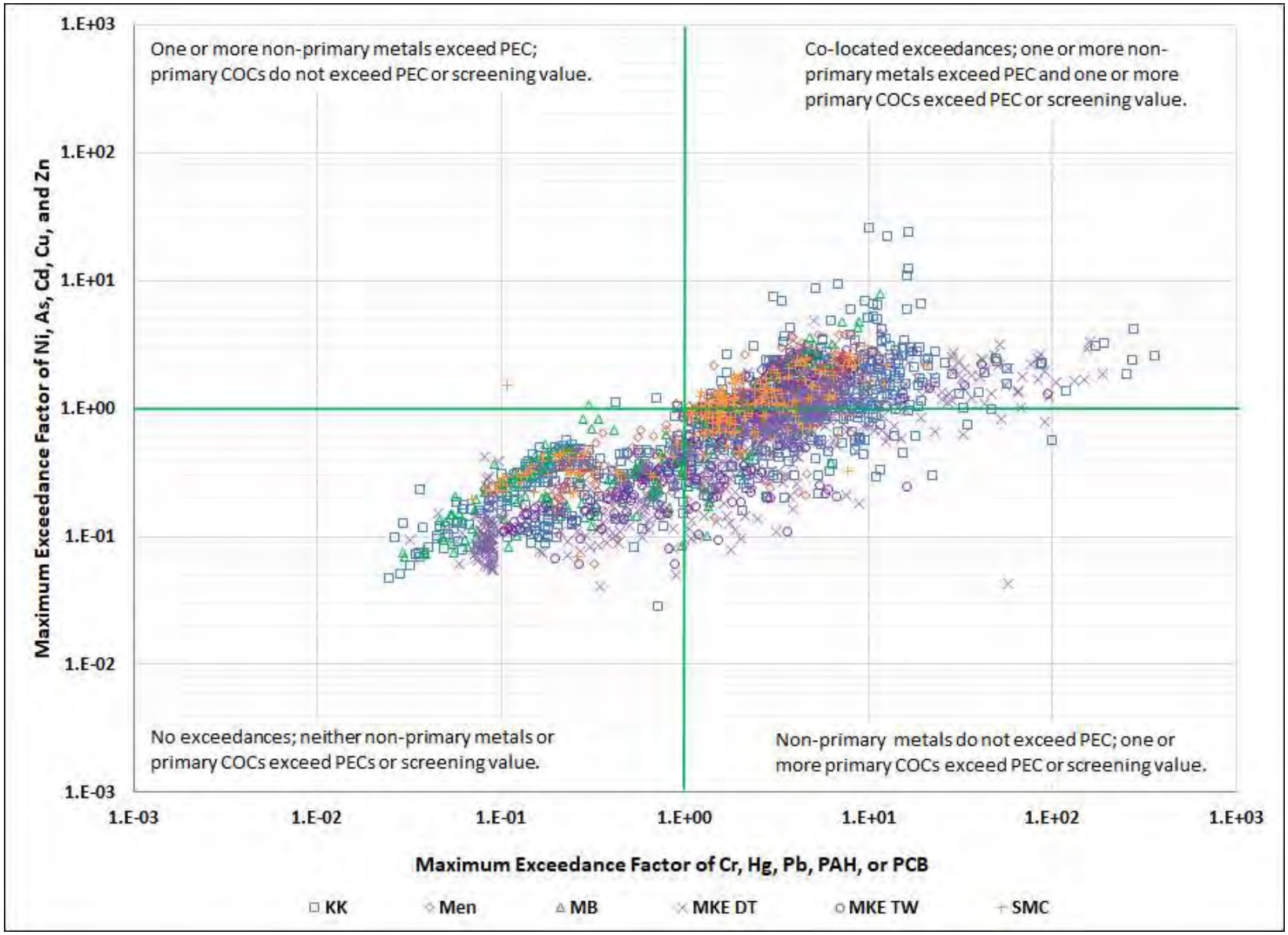
Jacobs



Notes:
KK – Kinnickinnic River
Men – Menomonee River
MB – Milwaukee Bay
MKE DT – Milwaukee River – Downtown
MKE TW – Milwaukee River – Third Ward
PEC = Probable Effect Concentration
SMC – South Menomonee Canal
As – arsenic
Cd – cadmium
Cr – chromium
Cu – copper
Hg – mercury
Ni – nickel
Pb – lead
Zn - zinc

Figure 2
Exceedance Factors: Non-Primary Metals vs. Primary Metals
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs



Notes:
COC – chemical of concern
KK – Kinnickinnic River
Men – Menomonee River
MB – Milwaukee Bay
MKE DT – Milwaukee River – Downtown
MKE TW – Milwaukee River – Third Ward
PEC = Probable Effect Concentration
SMC – South Menomonee Canal
As – arsenic
Cd – cadmium
Cr – chromium
Cu – copper
Hg – mercury
Ni – nickel
PAH – polycyclic aromatic hydrocarbon
Pb – lead
PCB – polychlorinated biphenyl
Zn - zinc

Figure 3
Exceedance Factors: Non-Primary Metals vs. Primary COCs
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Appendix C
Overview of Applicable Federal, State, and Local Permitting Requirements

Appendix C. Overview of Applicable Federal, State, and Local Permitting Requirements
Kinnickinnic River Project Area

Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin

Permit/Approval	Requirement/Purpose	Applicability to Project
Clean Water Act (CWA) Section 404 33 U.S. Code (USC) 1344 33 Code of Federal Regulations (CFR) 320 Rivers and Harbors Act of 1899 Section 10	Requires a permit from U.S. Army Corps of Engineers (USACE) for discharge of dredged or fill material into waters of the United States.	A CWA permit is anticipated to be required. Nationwide Permit (NWP) 38 – Cleanup of Hazardous and Toxic Waste (covers "specific activities required to effect the containment stabilization, or removal of hazardous or toxic waste materials that are performed, ordered or sponsored by a government agency with established legal or regulatory authority (USACE 2021). It is anticipated that project activities will be covered under NWP 38 as they are intended to contain or remove hazardous materials and the activities are sponsored by the U.S. Environmental Protection Agency (EPA). A preconstruction notification (PCN) will be required to gain coverage under NWP 38. If USACE determines that project activities are not able to be covered under NWP 38, an individual permit would be required.
CWA Section 401 Wisconsin Department of Natural Resources (WDNR's) NR 299 – Water Quality Certification (WQC)	Provides states with the authority to issue water quality certifications (WQCs) to ensure that federal agencies will not issue permits or licenses that violate the water quality standards of the state.	WQC is anticipated to be required. It is anticipated that the project will be covered under NWP 38. WDNR has conditionally issued WQC for projects authorized by NWP 38. It is anticipated that the project will meet the applicable state 401 WQC conditions.
Endangered Species Act of 1973, Section 7 Consultation 16 USC 1531 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.	Informal consultation with U.S. Fish and Wildlife Service is anticipated to be required as part of the CWA 404 permit authorization.
Fish and Wildlife Coordination Act 16 USC 661 et seq. Wisconsin Endangered Resources Review NR 27 – Endangered and Threatened Species	Requires consultation when a modification of a stream or other water body is proposed or authorized and requires protection of fish and wildlife from adverse effects of site action.	Consultation with the WDNR is anticipated to be required as part of the CWA 404 permit authorization.
Section 106 Concurrence National Historical Preservation Act of 1966 36 CFR Part 65 36 CFR 800	No activity is authorized under any NWP, which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.	Consultation with the Wisconsin State Historic Preservation Office is anticipated be required as part of the CWA 404 permit authorization.
Section 408 Authorization to Alter USACE Civil Works Projects 33 USC 408	Requires that alterations to any USACE federally authorized Civil Works project be reviewed and approved before being undertaken.	A Section 408 permit is anticipated to be required. Construction and operation of a temporary water treatment plant for the Great Lakes Legacy Act sediment remediation project is anticipated to occur within a portion of the existing USACE dredged materials disposal facility (DMDF) because of the proximity to the future dredged materials management facility (DMMF), where dredged sediment will be disposed.

Permit/Approval	Requirement/Purpose	Applicability to Project
Wisconsin Statutes Chapter 30 - Navigable Waters, Harbors, and Navigation NR 345 – Dredging in Navigable Waterways	Establish procedures and limitations for exempt activities, general permits, and individual permits for removal of material from the beds of navigable waterways within Wisconsin.	A Lake or Stream Dredging Individual Permit is anticipated to be required. Applicable for activities including dredging and placement of structures (such as fill material, sheet pilings, coffer dams) on the bed of a river and placement of residual sand cover. Dredged material will contain contaminants at concentrations equal to or greater than the PEC concentration as published in WDNR (2003); if so, the discharge from the dredging activities would not qualify for exemptions or coverage under a general permit.
40 CFR 761.77 NR 700 – Investigation and Remediation of Environmental Contamination	TSCA sediment removal and disposal would be implemented under the WDNR One Cleanup Program Memorandum of Agreement (RR-786) dated November 2014.	The process allows for approval of the remediation under WDNR lead and oversight, in coordination with the EPA, under state authority for the pathways addressed under the NR 700 rules series. Remediation performed under the requirements of NR 700 would be seen as equivalent to a TSCA cleanup for the environmental pathways addressed under the NR 700 rules series.
NR 216 – Storm Water Discharge Permit Construction Site Storm Water Runoff General Permit (Permit Number WI-S067831-6)	Wisconsin Pollutant Discharge Elimination System (WPDES) stormwater general permit authorizing stormwater discharge(s) from construction sites of one acre or more of land disturbance.	Coverage under the Wisconsin Construction Site Storm Water Runoff General Permit (WPDES Permit No. WI-S067831-6 is anticipated to be required. Applicable to stormwater runoff or other discharged water during construction activities that will disturb ≥1 acre.
WPDES Individual Discharge Permit	Individual (site-specific) permit authorizing discharge from dredging operations where carriage water or interstitial water from sediment dredging projects will be discharged to surface water.	An individual WPDES discharge permit is anticipated to be required. This permit applies for point source discharge of carriage and/or interstitial water to waters of the state from mechanical or hydraulic dredging operations that target sediment contaminants greater than the probable effect concentration (PEC) for sediment toxicity listed in the Consensus Based Sediment Quality Guidelines (WDNR 2003).
Federal Coastal Zone Management Act of 1972 16 USC 1451 et seq. Wisconsin Coastal Management Program (WCMP)	An applicant for a federal permit affecting any land, water use, or natural resource in the coastal zone must provide a consistency certification. The project proponent must certify that activities will comply with the approved policies of the WCMP and be conducted in a manner consistent with the policies.	A federal consistency determination is anticipated to be required. The Milwaukee Estuary AOC project area boundary is within the Wisconsin coastal zone (WCMP 2022).
Local Notice to Mariners 33 CFR 165 - Notification	Establishes procedures for controlled access areas and regulated navigation areas.	The notification is anticipated to be required. Applicable to in-water work being performed in waterways with commercial and/or recreational usage while project activities occur. Project is within the jurisdiction of U.S. Coast Guard District 9.

Sources:

U.S. Army Corps of Engineers (USACE). 2021. Nationwide Permits. 38 – Cleanup of Hazardous and Toxic Waste. Accessed October 18, 2022. https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/NWPs/2021/NWP%2038%20terms%20and%20conditions%202021.pdf?ver=QtThnf6ZPFepxqlnjVbESQ%3d%3d

Wisconsin Coastal Management Program (WCMP). 2022. About Us. Accessed October 18, 2022. https://doa.wi.gov/Pages/LocalGovtsGrants/CoastalManagement.aspx

Wisconsin Department of Natural Resources (WDNR). 2003. *Wisconsin Consensus-based Sediment Quality Guidelines. Recommendations for Use and Application,* Interim Guidance RR-088. December.

Note:

The overview of permitting requirements included in this appendix is preliminary and may change during detailed design. Additional permits that are not listed here may be identified during detailed design.

≥ = greater or equal to

CFR = Code of Federal Regulations

CWA = Clean Water Act

DMDF = USACE's dredged materials disposal facility

DMMF = proposed dredged materials management facility to support the Milwaukee Estuary Area of Concern project

NHPA = National Historic Preservation Act

NWP = Nationwide Permit

PCN = pre-construction notification

PEC = Probable Effects Concentration per WDNR 2003

TSCA = Toxic Substances Control Act

USC = U.S. Code

USACE = U.S. Army Corps of Engineers

WCMP = Wisconsin Coastal Management Program

WDNR = Wisconsin Department of Natural Resources

WPDES = Wisconsin Pollutant Discharge Elimination System

WQC = Water Quality Certification

Appendix D
Estimated Costs
(Removed)

Appendix E
Surface-weighted Average Concentration (SWAC) Evaluation

Jacobs

Appendix E
Technical Memorandum

Subject	**Kinnickinnic River Turning Basin Surface-weighted Average Concentration (SWAC) Methodology and Results Summary**
Project Name	Milwaukee Estuary Area of Concern, City of Milwaukee, Milwaukee County, Wisconsin Task Order 68HE0520F0069, Contract No. 68HE0519D00007
From	Jacobs
Date	August 2023

Surface-weighted average concentrations (SWACs) were calculated to evaluate existing and post-remediation conditions in the Turning Basin of the Kinnickinnic (KK) River Project Area within the Milwaukee Estuary Area of Concern (AOC) for the recommended Alternative 3A, which is described in Section 7 of the Focused Feasibility Study (FFS). The SWAC evaluation was performed to confirm the protectiveness of the recommended alternative. SWAC values representing the Turning Basin were calculated to evaluate existing and post-remediation conditions for contaminants of concern (COCs) (polychlorinated biphenyls [PCBs], polycyclic aromatic hydrocarbons [PAHs], chromium, lead, and mercury). The Turning Basin portion of the KK River Project Area was selected for performing the SWAC calculation evaluation because the majority of the sediment removal area (greater than 55 percent) associated with Alternative 3A resides in the Turning Basin, thereby having the greatest effect on SWAC values. SWAC calculations were performed using the three-dimensional (3D) contaminant model developed in Earth Volumetric Studio (EVS) software that was used to define the remediation target area (RTA) for each remedial alternative (FFS Section 3.2). Several advantages unique to using the 3D EVS model surfaces for estimating the post-remedy SWAC values include:

- Incorporation of COC concentrations representing the residual sediment at the 3:1 side slopes from shoreline and in-water structure setbacks.
- Incorporation of residual sediment COC concentrations intersected when dredging to the maximum dredge elevation.

Two EVS 3D model surfaces of concentration data for each COC were exported from EVS into ArcGIS to calculate SWAC values representing the following:

- COC concentrations of the upper 0.5 feet of the existing sediment surface to represent existing sediment conditions.
- COC concentrations for the upper 0.5 feet of the Alternative 3A post-dredge surface with overdredge allowance to represent post-remedy conditions.

ArcGIS was then used for converting the 3D model concentration surfaces into a gridded network of 10 -foot cells within the project area boundary, thereby creating an equally weighted COC concentration for each grid cell. The concentration values assigned to the 10-foot cells was averaged using the geometric center of each cell for calculation of the project area SWAC value.

For the purposes of calculating the Alternative 3A post-remedy SWAC value, several modifications to the exported EVS 3D model surface concentrations were required to account for the application of sand cover within the Turning Basin RTA.

Cells located within the portion of the Turning Basin RTA designated for sand cover (Figure 7-1) were assigned a cell value equal to a 2:1 ratio of the COC laboratory detection limit to represent a minimum sand cover thickness of 12 inches over the upper 6 inches of residual sediment surface COC concentrations, representative of post-dredge conditions, thereby assuming a post-dredge surface dilution factor of 66 percent. If a thicker sand cover is applied (for example 18 inches) as part of the remedy, the dilution factor will increase thereby reducing SWAC values further. Cells within the Turning Basin RTA boundary designated for post-dredge residual sand cover following sediment removal were assigned a cell value equal to a 1:1 ratio of the COC laboratory detection limit to represent a 6-inch residual sand cover and sediment surface concentrations representative of post-dredge conditions, thereby assuming a post-dredge surface dilution factor of 50 percent following residual sand cover placement. Cells outside of the Turning Basin RTA where remediation is not required (where concentrations are less than [<] cleanup goals [CUGs]) used existing sediment surface COC concentrations.

Exhibit E-1 summarizes the calculated SWAC values for the KK River Turning Basin sediment for existing conditions and post-remediation conditions after implementation of Alternative 3A. As indicated in Exhibit E-1, post-remediation SWAC values are less than the existing condition (pre-remediation), the CUGs, and probable effect concentrations (PECs).

Figures E1 through E5 present existing and post-remedy surface sediment concentrations of the gridded network of 10-foot cells across the Turning Basin RTA. Further evaluation of post-remedy surface sediment COC concentrations will be performed to identify individual areas where post-remediation cell concentrations exceed CUGs in Turning Basin. Locations of cell concentrations with CUG exceedances will be further evaluated and prioritized for additional capping or sediment removal if sufficient DMMF capacity and project resources are available.

Exhibit E-1. Kinnickinnic River Turning Basin- Surface Weighted Average Concentrations[a] for Existing and Post-Remediation Scenarios – Alternative 3A

Relevant Standards	**PCB**	**PAH**	**Chromium**	**Lead**	**Mercury**
PEC[b]	0.67	22.8	110	130	1.1
CUG[c]	1	68.4	330	390	3.3
SWAC Values	**PCB**	**PAH**	**Chromium**	**Lead**	**Mercury**
SWAV Values: Existing Condition	0.62	13	153	133	0.49
SWAC Values: Post-Remedy	0.31	8	77	64	0.23

[a] Values reported in milligrams per kilogram

CUG = Clean up Goal

PAH = polycyclic aromatic hydrocarbons

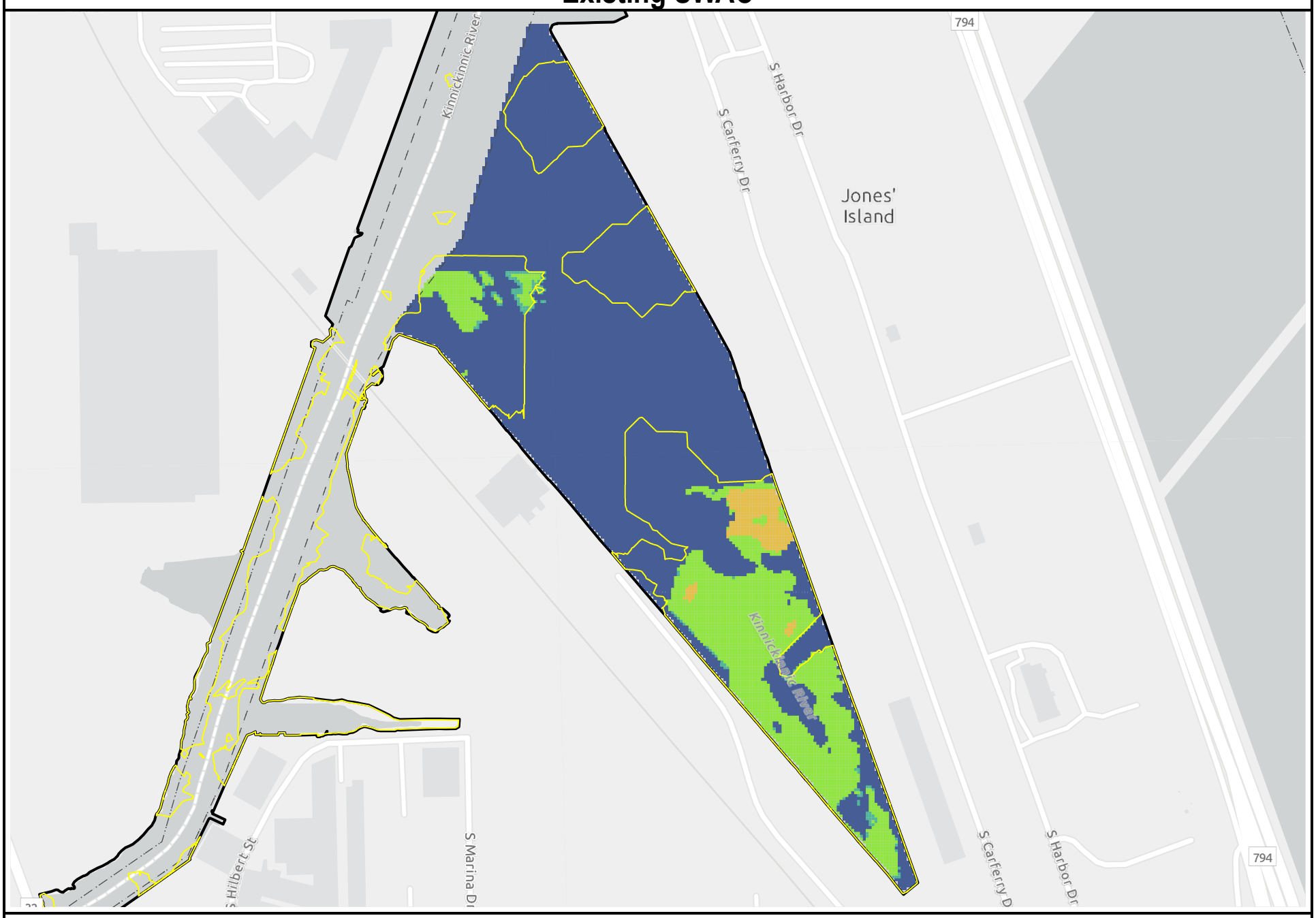
PCB = polychlorinated biphenyls

PEC = Probable Effect Concentration

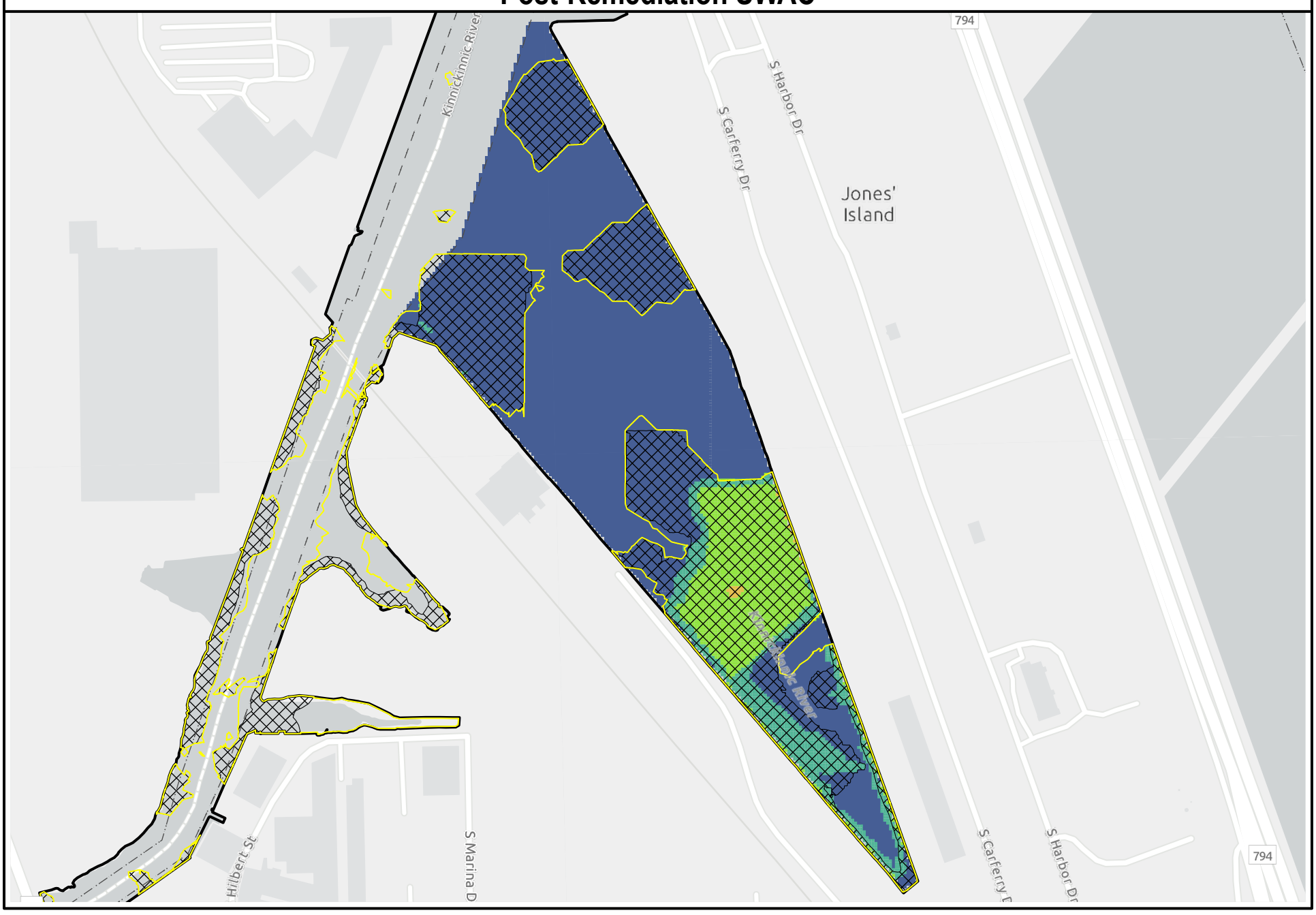
SWAC = surface-weighted average concentration

Figures

Existing SWAC



Post-Remediation SWAC



LEGEND

- Federal Navigation Channel (Source: United States Army Corps of Engineers)
- Remedial Target Area
- Cap or Sand Cover Extents
- Kinnickinnic River Project Area

PCB Concentrations (mg/kg)

- < 0.059
- 0.059 - 1
- 1 - 3
- 3 - 5
- > 5

N

0 450

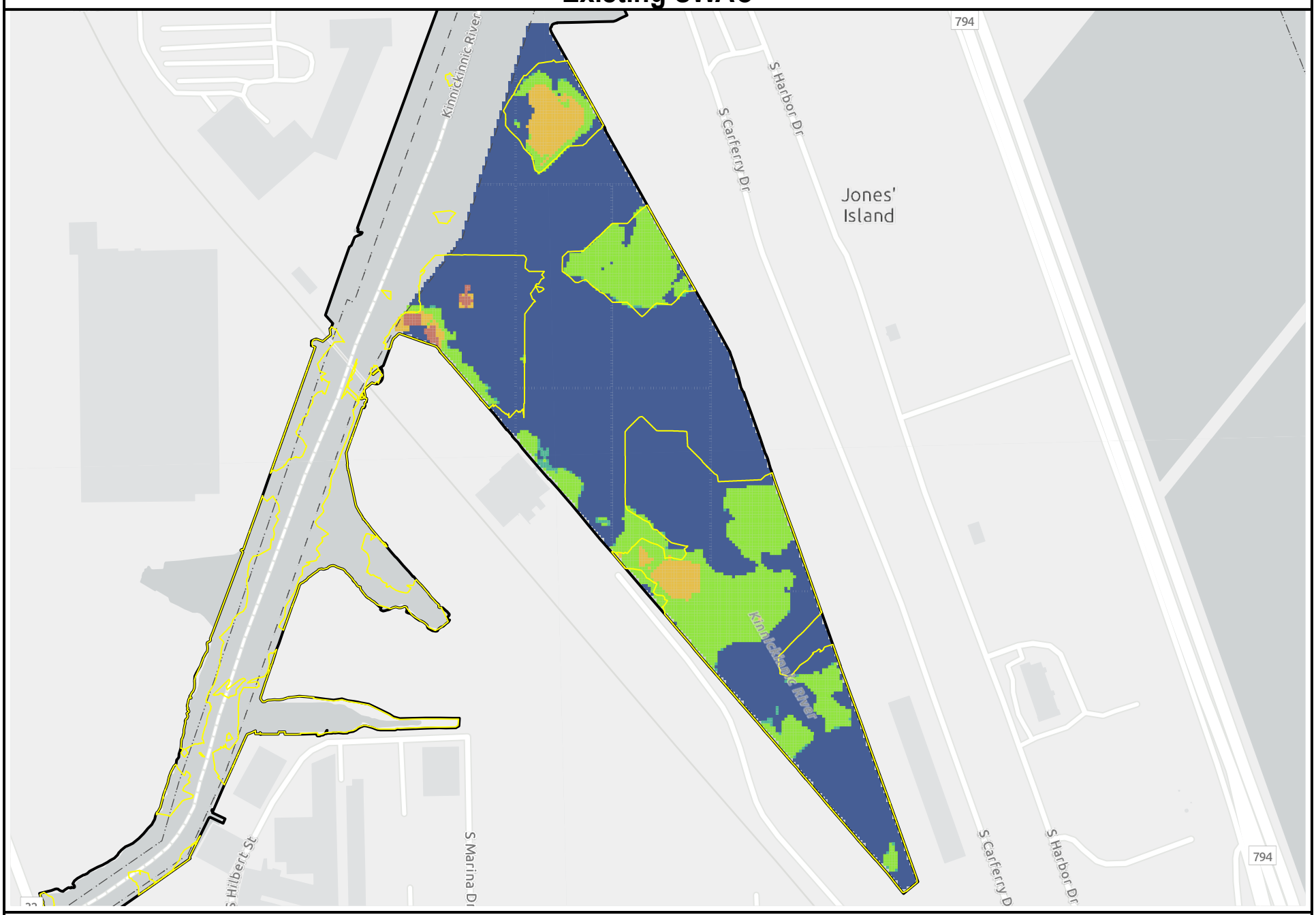
Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. PCB = polychlorinated biphenyl; mg/kg = milligrams per kilogram; SWAC = Surface Weighted Average Concentration

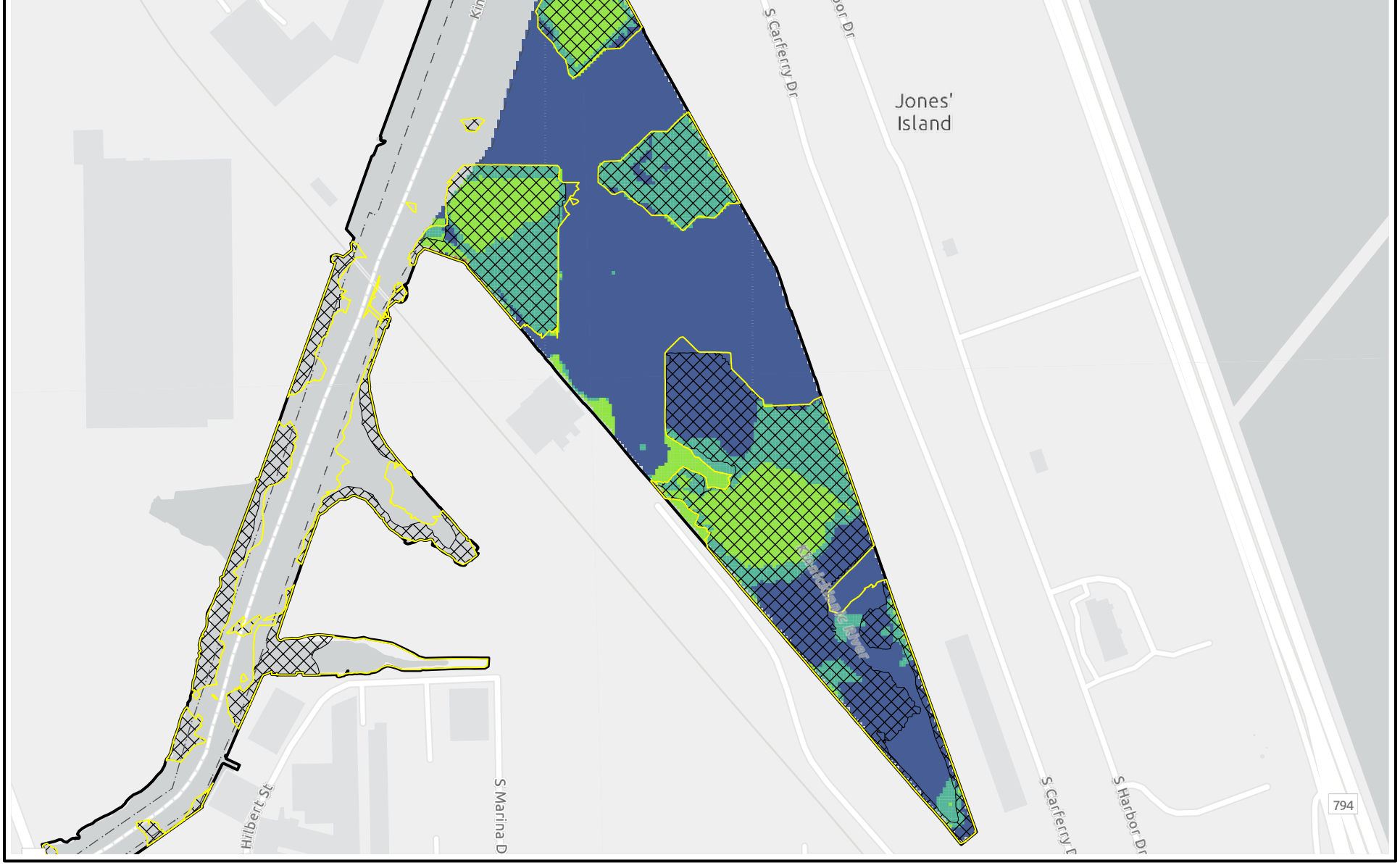
Figure E1
Alternative 3A - PCB SWAC Summary
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Existing SWAC



Post-Remediation SWAC



LEGEND

- Federal Navigation Channel (Source: United States Army Corps of Engineers)
- Remedial Target Area
- Cap or Sand Cover Extents
- Kinnickinnic River Project Area

PAH Concentrations (mg/kg)

- < 0.015
- 0.015 - 22.8
- 22.8 - 68.4
- 68.4 - 114
- > 114

N

0 450

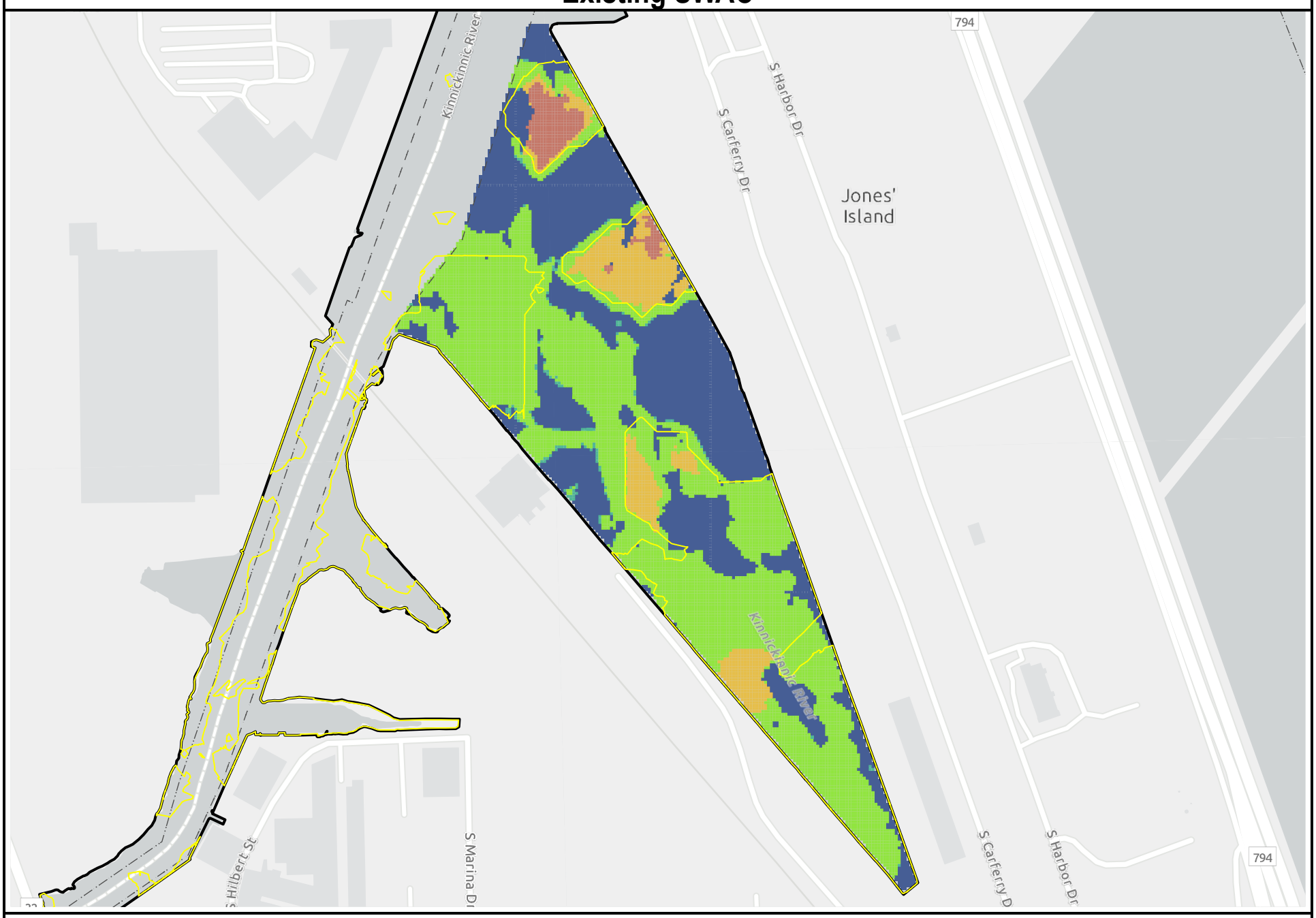
Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. PAH = polycyclic aromatic hydrocarbons; mg/kg = milligrams per kilogram; SWAC = Surface Weighted Average Concentration

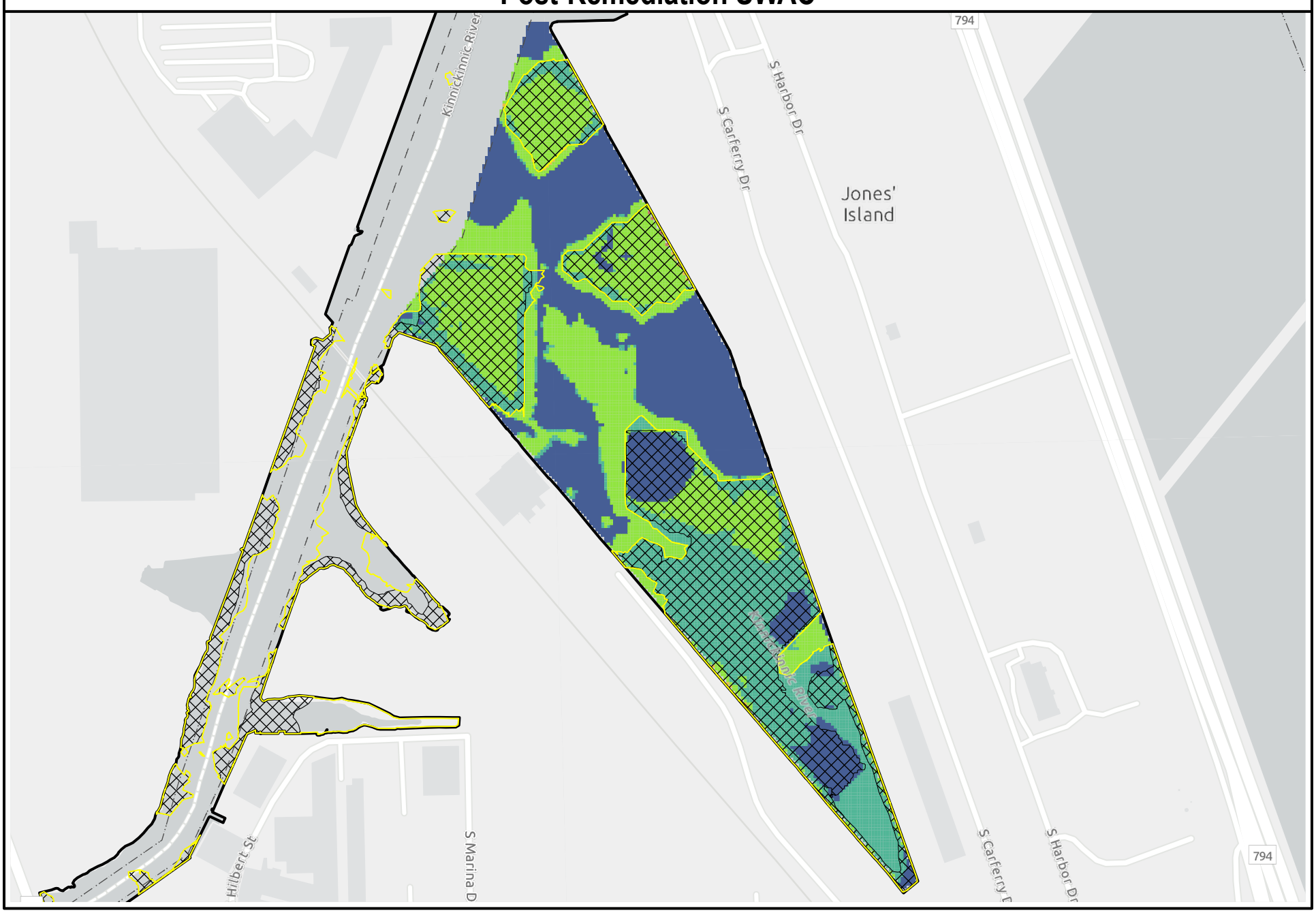
Figure E2
Alternative 3A - PAH SWAC Summary
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Existing SWAC



Post-Remediation SWAC



LEGEND

- Federal Navigation Channel (Source: United States Army Corps of Engineers)
- Remedial Target Area
- Cap or Sand Cover Extents
- Kinnickinnic River Project Area

Chromium Concentrations (mg/kg)

- < 0.28
- 0.28 - 110
- 110 - 330
- 330 - 550
- > 550

N

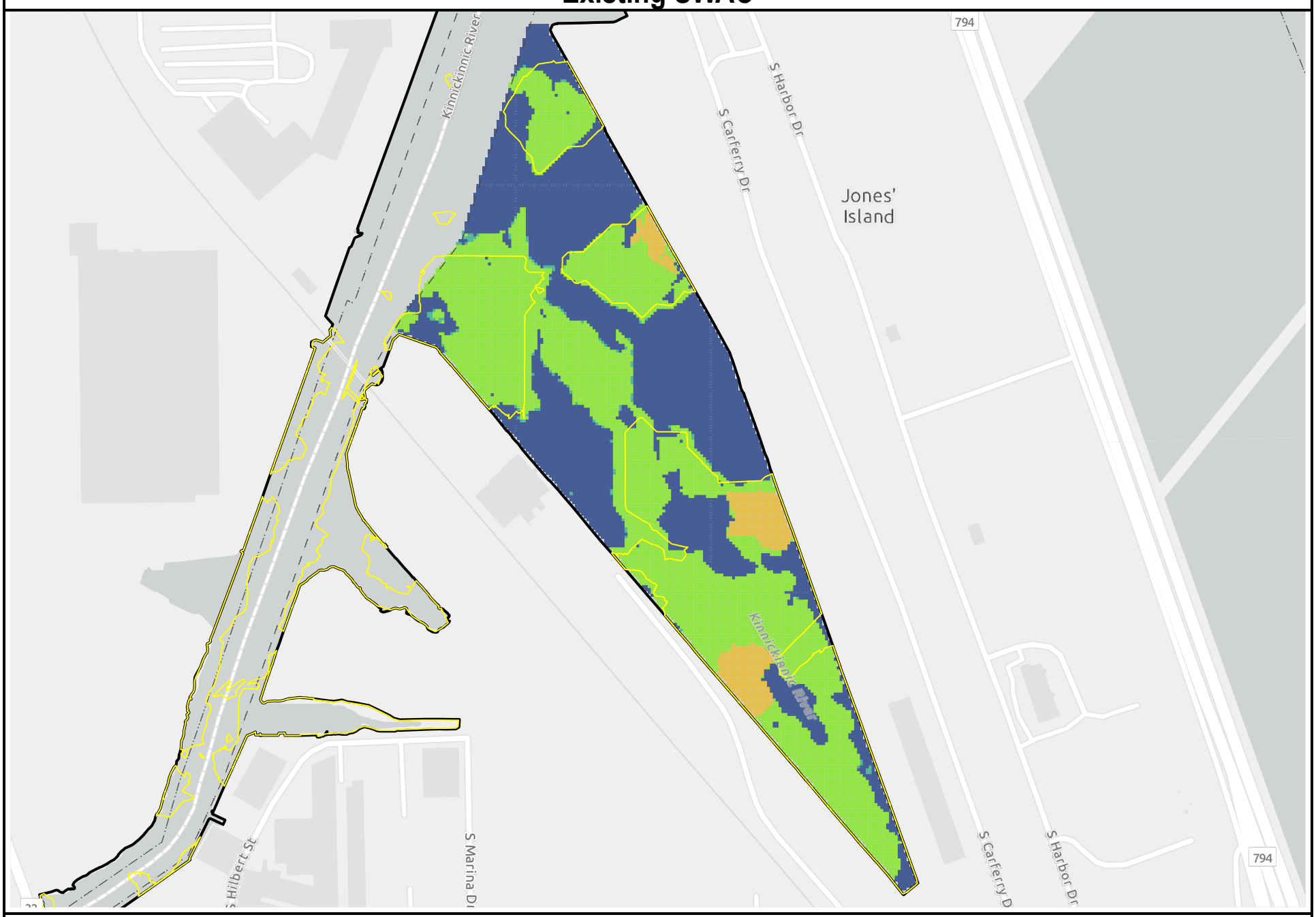
0 450

Approximate scale in feet

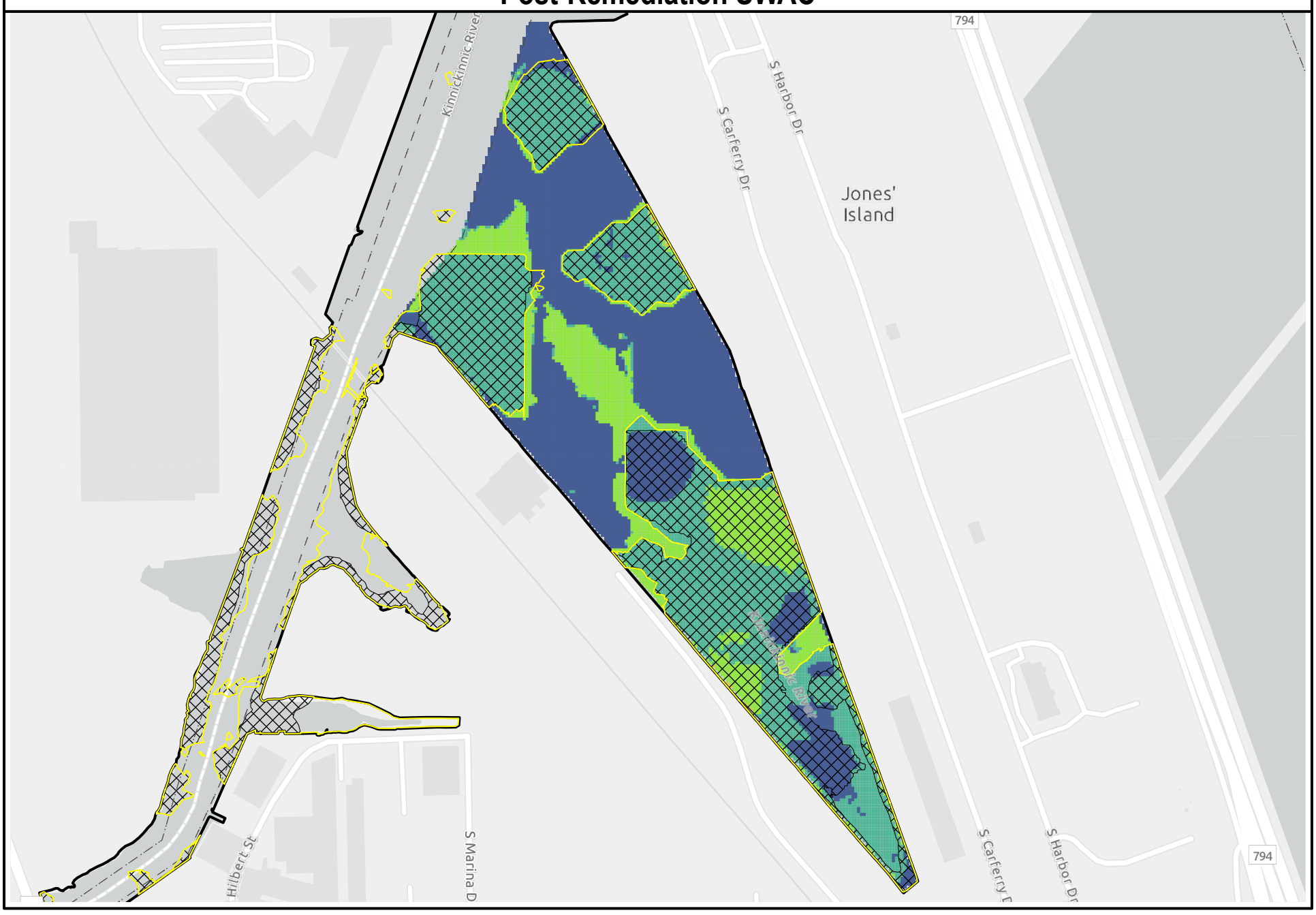
Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. mg/kg = milligrams per kilogram; SWAC = Surface Weighted Average Concentration

Figure E3
Alternative 3A - Chromium SWAC Summary
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Existing SWAC



Post-Remediation SWAC



LEGEND

- Federal Navigation Channel (Source: United States Army Corps of Engineers)
- Remedial Target Area
- Cap or Sand Cover Extents
- Kinnickinnic River Project Area

Lead Concentrations (mg/kg)

- < 0.60
- 0.60 - 130
- 130 - 390
- 390 - 650
- > 650

N

0 450

Approximate scale in feet

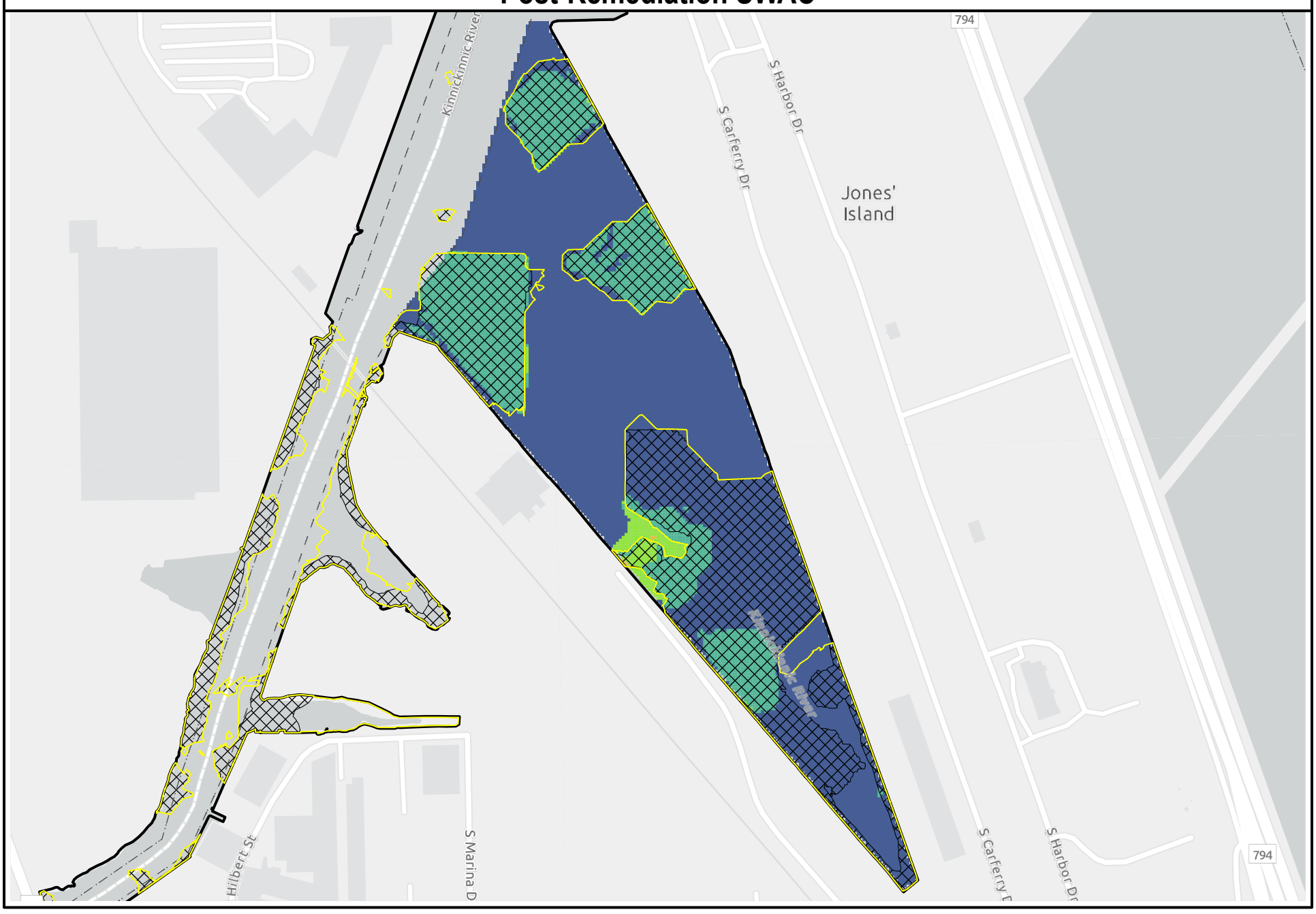
Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. mg/kg = milligrams per kilogram; SWAC = Surface Weighted Average Concentration

Figure E4
Alternative 3A - Lead SWAC Summary
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Jacobs

Existing SWAC

Post-Remediation SWAC



LEGEND

- Federal Navigation Channel (Source: United States Army Corps of Engineers)
- Remedial Target Area
- Cap or Sand Cover Extents
- Kinnickinnic River Project Area

Mercury Concentrations (mg/kg)

- 0 - 0.077
- 0.077 - 1.1
- 1.1 - 3.3
- 3.3 - 5.5
- >5.5

N

0 450

Approximate scale in feet

Notes:
1. Basemap source: Esri ArcGIS Online Light Gray Base Map
2. mg/kg = milligrams per kilogram; SWAC = Surface Weighted Average Concentration

Figure E5
Alternative 3A - Mercury SWAC Summary
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Appendix F
Frequently Asked Questions

WATERWAY RESTORATION PARTNERSHIP
MILWAUKEE ESTUARY AREA OF CONCERN

Milwaukee Estuary Contaminated Sediment Cleanup Public Outreach Meetings: Frequently Asked Questions (FAQ)

This document summarizes questions and comments received in association with the public meetings held on November 2, 2023; February 15, 2024; April 25, 2024; and June 13, 2024. Additional information such as posters and technical details describing the contaminated sediment cleanup project are included in the Focused Feasibility Study Report. Please visit the Waterway Restoration Partnership website.

FAQ1: Will the sediment churned up during dredging be a problem downstream /elsewhere in the water?

Construction best management practices (BMPs) will be used during dredging to minimize the impacts from disturbing the sediment. Turbidity curtains will be used around the dredge areas to contain resuspended sediment, and monitoring will be conducted to confirm effectiveness and make modifications to the curtain if needed.

FAQ2: What are the general features of the Dredged Materials Management Facility construction, how is leakage of contamination into the lake prevented once material has been placed inside, and how long will the sediment be in the containment facility?

The Dredged Materials Management Facility (DMMF) has a design life of 100 years and will be a steel structure with an inner and outer wall. The walls will be tied together with steel tie rods and the space between the walls will be filled with aggregate (rock). In addition to the steel walls, there will also be another wall in the middle of the structure which will be 2.5 to 3-feet thick. That center wall, called a soil-mix wall, will be impermeable and will not allow water or contaminants to pass through. Sediment placed in the DMMF will permanently remain there. Sediment will not be filtered or amended in the facility. There will be a temporary water treatment facility during this cleanup project that will treat water that is currently inside the DMMF and precipitation that falls onto the DMMF.

FAQ3: Have fish consumption advisory posters been installed at public fishing locations along the river and Lake Michigan?

Fish consumption signage has been installed at various locations along the Milwaukee River from Lincoln Park to the former North Avenue Dam. Partners are working to identify the best locations for installing additional signs throughout the project areas. The signs provide information that was developed in collaboration with Wisconsin Department of Natural Services (WDNR) and the Wisconsin Department of Health Services (DHS).

For additional information on fish consumption advisories, please visit the Wisconsin Department of Natural Resources.

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FAQ4: During the actual "dredging" will there be foul odors in the air? Is there an airborne risk for workers and residential neighbors?

None of the contaminants found in the project areas are expected to produce odors during dredging or excavation. Some of the dredged sediment may contain decaying organic matter that has a distinctive odor. Best management practices (BMPs) will be used during construction to mitigate odors and dust.

FAQ5: Will the Milwaukee River be restored to conditions making the waters safe for swimming as a recreation?

The river and floodplains remedial actions are intended to address the Milwaukee Estuary Area of Concern (AOC) beneficial use impairments (BUIs) that are specific to legacy contaminants such as heavy metals, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The remedial actions are not designed to address other water quality issues such as bacterial or viral contaminants that could affect safe swimming.

FAQ6: How will the funding of this project, including the habitat projects, be impacted by this being an election year?

Funding has already been appropriated and approved by congress for this project. Currently no impact on federal funding is anticipated.

FAQ7: Regarding the resuspension of sediment from propeller wash, how deep does dredging need to occur to not allow propeller wash?

The depth of influence of propeller wash is vessel-specific and will be evaluated as part of the design. Areas that are dredged and susceptible to propeller wash will be designed to be protective through adequate depths and placement of a cover material to minimize the risk of resuspension.

FAQ8: Has the amount of water displaced by the dredging been evaluated against the flow rate of the river?

A stream gauge located at Jones Island in Milwaukee, Wisconsin measures the flow of water in the Milwaukee River as it enters Lake Michigan. The main source of water to the river is precipitation, including snowmelt and storms. There are several tributaries that feed into the Milwaukee River, including the Menomonee River and the Kinnickinnic River. Seasonal trends show that flow is typically highest in the spring and lowest in the winter. The year over year average measured at the Jones Island gauge is approximately 3,000 cubic feet per second (cfs) with the maximum measured peak flow of 22,000 cfs. The anticipated flow rate for the dredging activities is 20 to 30 cfs, so only a small fraction of the total flow.

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FAQ9: What happens to the water after entering into the Dredged Materials Management Facility?

The solids settle within the Dredged Materials Management Facility and the water is removed and treated through a temporary water treatment plant to meet the State of Wisconsin discharge criteria. Treated water is then likely discharged to Lake Michigan. Testing is performed to confirm discharge criteria is being met.

FAQ10: How far will the hydraulic dredges be from the Dredged Materials Management Facility?

The farthest dredge from the Dredged Materials Management Facility (DMMF) will be 3.9 miles. Booster pumps will be used along the pipeline route to facilitate pumping the sediment to the DMMF. Much of the pipeline route will be submerged to avoid conflict with vessel traffic.

FAQ11: What is comprised of the sand layer? Can it survive turbulent storms?

The specific composition of the sand layer will be determined during remedial design. The sand layer is not intended to be an immobile engineered cap, and some movement may occur during large storms. However, engineered caps will be used where contaminated sediment is left in place.

FAQ12: What are the dredging depths?

The dredge depths are designed to remove contaminants which vary in depth across the project area and will be finalized during remedial design.

FAQ13: Are there plans to monitor the ecosystem afterwards?

The Milwaukee River Area of Concern (AOC) has 11 beneficial use impairments (BUIs), 7 of which are related to contaminated sediment. The Remedial Action Plan for the AOC includes a range of actions and monitoring processes for tracking the effectiveness of remedial measures and confirming the restoration of beneficial uses. The sediment remediation projects will contribute to the overall efforts to remove the BUIs and de-list the AOC.

FAQ14: What are the potential wildlife impacts that could be caused by the Dredged Materials Management Facility construction?

A waterfowl study was completed for the existing CDF facility. The area contains mostly migratory species that do not reside in the area permanently, which decreases the potential impact.

FAQ15: Will there be opportunities for hands-on activities and models for the community?

There is a potential to include hands-on activities in forthcoming public engagement activities.

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FAQ16: There is a historic wall on the Pleasant Valley Park side of the river. Will this feature be preserved during the construction?

The historic wall located within Gordon Park, associated with the former bath house, has been noted as a structure of cultural significance. Currently the area of remediation is not anticipated to interfere with the structure.

FAQ17: Have we engineered the Dredged Materials Management Facility to capture natural and unnatural surges?

The DMMF was designed for a range of water levels, wind and wave events, ice, rainfall, and climate change.

Have a question? Looking for a general project overview?

Check out this Fact Sheet for more information including project partner contact information.

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