290 Elwood Davis Road, Suite 340
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315.453.9009

May 4, 2021

Mr. Christopher Dietrich (via email)
Project Manager
Wisconsin Department of Natural Resources
Remediation and Redevelopment Program
2300 N. Martin Luther King Jr. Drive
Milwaukee, Wisconsin 53212

Re: *Summerfest Lagoon Sampling Technical Memorandum*
Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin
EPA GLRI Grant No. GL-00E02392

Dear Mr. Dietrich:

Anchor QEA, LLC, is pleased to submit for your review the final *Summerfest Lagoon Sampling Technical Memorandum* for the Summerfest Lagoon area located in the Milwaukee Estuary Area of Concern, Milwaukee, Wisconsin. This updated *Summerfest Lagoon Sampling Technical Memorandum* addresses DNR's comments provided on April 29, 2021. The DNR's comments and responses to these comments are also included in the attached table.

Should you have any questions regarding this report, please contact Kim (315-414-2014; kpowell@anchorqea.com) or Paul (315-414-2044; pdoody@anchorqea.com) at your convenience.

Sincerely,

Kim Powell, PE
Project Manager
Anchor QEA, LLC

Paul Doody, PE
Principal/Engineer on Record
Anchor QEA, LLC

cc: Scott Inman, DNR
Brennan Dow, DNR

Attachment

Attachment 1 Comment and Response Matrix for *Draft Summerfest Lagoon Technical Memorandum (Rev 1) Comments*

Comment and Response Matrix
Draft Summerfest Lagoon Technical Memorandum (Rev 1) Comments

Comment No.	Section	Reviewer	Comment	Response to Comment
1	Appendices	DNR	Our goal is to keep this memo small enough to easily email. The bathymetric files are huge, mostly due to embedded data. Can Anchor include reduced file size images in the appendices? Same with the remaining appendices, please keep in if the file size can remain relatively small but reference the SIR if not.	Reference to the bathymetry and UAV surveys have been revised to the SIR. The file size for the remaining appendices (photographs, field notes, and core logs) has been reduced.
2	Section 4.3	DNR	Add reference for RCLs from Chapter NR 720 of Wisconsin Administrative Code	The text has been revised to include the reference.
3	Section 4.3	DNR	Add "the RCLs are for upland soils and are therefore not applicable to sediment. Contaminants in sediment have different characteristics than from when they are in soils, which include the potential to harm aquatic life such as benthos and fish. Thus screening levels for contaminants in sediment may be higher or lower than their respective soil RCLs. RCLs for cyanide are presented in this report for comparative purposes only. For a complete analysis, screening levels for cyanide would have to be adopted from an agency outside of the DNR, or site specific values calculated; both of which are outside the scope of this project."	The text has been revised as requested.
4	Section 5.2.2	DNR	Add groundwater protection RCL in for comparison purposes for cyanide and list the one location that exceeded it.	The text has been revised as requested.
5	Section 6, 3rd Paragraph	DNR	Change last sentence to "Thus the exposure pathway for benthos and fish potentially may be limited, but would have to be further evaluated outside of the scope of this project."	The text has been revised as requested.

Comment and Response Matrix
Draft Summerfest Lagoon Technical Memorandum (Rev 1) Comments

Comment No.	Section	Reviewer	Comment	Response to Comment
6	Section 6	DNR	Add "Future sediment work in the Summerfest Lagoon and adjacent shoreline areas needs to take into consideration planned AOC habitat features. Depending on the need for sediment remediation in the Milwaukee Bay, these habitat features could be impacted if constructed beforehand. Coordination between all involved parties is recommended."	The text has been revised to include the reference.
7	Section 6	DNR	Remove "All samples collected from shoreline areas, both north and adjacent to the Summerfest Lagoon, resulted in chemical concentrations below the screening values. No further assessment of sediment in these areas is recommended." (Note: there are no applicable screening values and further evaluation of the sediment is planned.)	The text has been revised to include the reference.

May 2021
Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern

ANCHOR QEA

Summerfest Lagoon Sampling Technical Memorandum

Prepared for Wisconsin Department of Natural Resources and U.S. Environmental Protection Agency Great Lakes National Program Office
EPA GLRI Grant No. GL-00E02392

May 2021
Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern

Summerfest Lagoon Sampling Technical Memorandum

Prepared for
Wisconsin Department of Natural Resources
2300 N. Martin Luther King Jr. Drive
Milwaukee, Wisconsin 53212

U.S. Environmental Protection Agency
Great Lakes National Program Office
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Prepared by
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Liverpool, New York 13088-2104

Project Number: 201779-02.01
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ABBREVIATIONS

AOC	Area of Concern
ASTM	ASTM International
BRRTS	Bureau for Remediation and Redevelopment Tracking System
COC	contaminant of concern
D-C RCL	direct contact RCL
DNR	Wisconsin Department of Natural Resources
EPA	U.S. Environmental Protection Agency
ERP	Environmental Repair Program
ETA	Eurofins TestAmerica
FSP	*Field Sampling Plan*
GLRI	Great Lakes Restoration Initiative
GW RCL	groundwater quality RCL
KK River	Kinnickinnic River
LiDAR	Light Detection and Ranging
mg/kg	milligrams per kilogram
MKE AOC	Milwaukee Estuary Area of Concern
ND	not detected
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEC	probable effects concentration
PID	photoionization detector
QAPP	*Quality Assurance Project Plan*
RCL	residual contaminant level
SIR	*Site Investigation Report*
Tech Memo	Summerfest Lagoon Technical Memorandum
TOC	total organic carbon
U or ND	non-detect
UAS	unmanned aerial system
VOC	volatile organic compound

1 Introduction

This *Summerfest Lagoon Sampling Technical Memorandum* (Tech Memo) describes the results of the field activities performed in fall 2020 to characterize sediments within the Summerfest Lagoon that is part of the Kinnickinnic River (KK River) and Milwaukee Bay Project within the Milwaukee Estuary Area of Concern (MKE AOC). The work was performed in accordance with the approved *Field Sampling Plan* (FSP; Anchor QEA 2020) and *Quality Assurance Project Plan* (QAPP; Appendix B of the FSP). Additional detail pertaining to the larger KK River and Milwaukee Bay Project can be found in the *Site Investigation Report* for KK River and Milwaukee Bay (SIR; Anchor QEA 2021).

This Tech Memo has been prepared for the Wisconsin Department of Natural Resources (DNR) under the U.S. Environmental Protection Agency (EPA) Great Lakes Restoration Initiative (GLRI) grant (EPA GLRI Grant No. GL-00E02392).

1.1 General Site Information

Site Name:	Summerfest Lagoon is part of the Kinnickinnic River and Milwaukee Bay Project within the Milwaukee Estuary AOC, Milwaukee, Wisconsin (Figure 1-1)
BRRTS Site No.:	02-41-585627
DNR Facility ID No.:	341324060
Site Location:	Summerfest Lagoon and adjacent shoreline areas north of the lagoon—extends from the shoreline east, part of NE1/4 of the NW1/4 of Section 33, SE ¼ of the SW ¼ of Section 28, Township 7 North, Range 22E
Site Administrator:	Wisconsin Department of Natural Resources 2300 N. Martin Luther King Jr. Drive Milwaukee, Wisconsin 53212 Contact: Christopher Dietrich, P.G. Telephone: (262) 289-0006 Email: christopher.dietrich@wisconsin.gov
Consultant:	Anchor QEA, LLC 290 Elwood David Road, Suite 340 Liverpool, New York 13088-2104 Project Manager: Kim Powell Telephone: (315) 414-2014 Email: kpowell@anchorqea.com Engineer-of-Record: Paul Doody Telephone: (315) 414-2044 Email: pdoody@anchorqea.com

Subcontractors:	The Sigma Group, Inc. 1300 W. Canal Street Milwaukee, Wisconsin 53233 Contact: Kristin Kurzka Telephone: (414) 643-4127 Email: kkurzka@thesigmagroup.com	Great Lakes Environmental Center, Inc. 31700 W. Thirteen Mile Road, Suite 215 Farmington Hills, Michigan 48334 Contact: John Barkach Telephone: (248) 538-0900 Email: jbarkach@glec.com
Laboratories:	Eurofins TestAmerica 301 Alpha Drive Pittsburgh, Pennsylvania 15238 Contact: Carrie Gamber Telephone: (412) 963-2428 Email: carrie.gamber@testamericainc.com	Eurofins TestAmerica 30 Community Drive South Burlington, Vermont 05403 Contact: Jim Madison Telephone: (802) 923-1028 Email: Jim.Madison@testamericainc.com

2 Background Information

This section provides background information of the site, including a brief site description and an overview of the site history.

2.1 Site Description

The MKE AOC is one of five Great Lakes Areas of Concern (AOCs) in Wisconsin. In August 2020, Wisconsin delisted its first AOC, the Lower Menominee River AOC, leaving four AOCs remaining in Wisconsin. The MKE AOC comprises portions of three rivers—Milwaukee, Menomonee, and KK—and the inner harbor, outer harbor, and nearshore areas of Lake Michigan, bounded by a line extending north from Sheridan Park to the City of Milwaukee's Linnwood water intake (Figure 1-1). The MKE AOC was initially listed in 1987 under the Great Lakes Water Quality Agreement. This AOC was later expanded in 2008 to include legacy contaminated sediments in the Little Menomonee River located in the upper portion of the Menomonee River, along with Lincoln Creek and Cedar Creek located in the upper portion of the Milwaukee River.

Though the MKE AOC contains multiple rivers and reaches, the sediment investigation and the primary work described herein focuses on the Summerfest Lagoon area located within the Milwaukee Bay.

2.1.1 Summerfest Lagoon

The Summerfest Lagoon is approximately 35 acres in size. It is located 0.25 mile north of the mouth of the Milwaukee River and is included in the outer harbor. The lagoon consists of two basins—the northern Maritime Basin (approximately 15 acres) and a southern Quiet Water Basin (approximately 20 acres). The two basins are separated by an isthmus with an 80-foot-wide navigation channel and overhead pedestrian bridge, which connects the Summerfest Grounds to Lakeshore State Park. The lagoon is connected to the outer harbor through a 100-foot-wide channel at its north side.

2.1.1.1 Maritime Basin

The Maritime Basin is the northern 15-acre basin near the Pier Wisconsin breakwater. Based on a multibeam bathymetric survey performed in fall 2020 (Anchor QEA 2020), water depths in the basin vary from 20 to 22 feet in the northernmost portion of the Maritime Basin. Water depths range from 16 to 18 feet at both the basin's entrance channel and connection channel to the Quiet Water Basin. The SIR for the KK River and Milwaukee Bay presents the multibeam bathymetric and side-scan sonar survey results (Anchor QEA 2021).

The northern shore of the Maritime Basin is occupied by Pier Wisconsin, Discovery World, a municipal pier, and mooring sites.

2.1.1.2 Quiet Water Basin

The Quiet Water Basin is the southern portion of the Summerfest Lagoon and further separated into a smaller north basin and a larger south basin. The water depths of the Quiet Water Basin are approximately 14 feet in the north basin and are up to 22 feet at the southernmost end of the south basin (Anchor QEA 2021).

The western and southern shores of the lagoon are occupied by the Henry Maier Festival Park (Summerfest Grounds). The eastern and northeastern shores are occupied by the Lakeshore State Park.

2.2 Site History

The Summerfest Lagoon area has changed dramatically over the past century as observed on U.S. Army Corps of Engineers and National Oceanic and Atmospheric Administration historical maps. In the 1930s, the area comprised Lake Michigan shoreline with one of the city's first airstrips[1] (Figure 2-1a). By the 1950s, the airstrip was replaced with a military installation, established to protect the city during the Cold War (Figure 2-1b). Major infilling of the shoreline began in the 1970s with the construction of McKinley Marina, as well as the expansion of the Pier Wisconsin area (Figure 2-1c). Shoreline development continued into the 2000s with the development of the Lakeshore State Park (Figure 2-1d) and the establishment of the two basins (Figure 2-1e). The site history of the Maritime Basin and Quiet Water Basin are further described in the following sections.

2.2.1 Maritime Basin

Pier Wisconsin forms the northern boundary of the Maritime Basin. It was originally constructed in the early 1900s as a municipal pier. The pier was the former location of the Milwaukee Municipal Passenger and Auto Ferry, discontinued in 1970 and 1973, respectively. The pier remained in use until 1993 when the Port Milwaukee office was moved from the pier to its current location on Jones Island. The pier was redeveloped into the current Discovery World facility, which opened in 2004. The facility includes a building that houses a museum, fish tanks and conference spaces, support buildings, docks, and a breakwater pier. The Discovery World facility currently discharges treated wastewater (5,000 to 25,000 gallons per day when discharging) to the lagoon.

Pier Wisconsin has a closed Bureau for Remediation and Redevelopment Tracking System (BRRTS) site—Pier Wisconsin Schooner Museum (BRRTS No. 02-41-094270). Sediment was not sampled during investigations of this site, which is currently a closed Environmental Repair Program (ERP) site with no continuing obligations. Contaminants of concern (COCs) at the ERP site are polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs).

[1] A history of Summerfest's Maier Festival Park grounds is available at the following link: https://onmilwaukee.com/articles/summerfestgroundshistory.

2.2.2 Quiet Water Basin

The original shore of Lake Michigan existed approximately 1,000 feet west of the current Summerfest Grounds shoreline. The Summerfest Grounds, portions of the lagoon, and Lakeshore State Park are constructed entirely of various fill and dredged materials over the original lakebed. The shoreline consists of armor stone revetment, steel sheetpile walls, and rocky beach, all of which were evident on a recent side-scan sonar survey of the area (Anchor QEA 2021).

There are two open BRRTS sites associated with the Summerfest Grounds—Milwaukee World Festival (BRRTS No. 02-41-001212), an ERP site; and Milwaukee World Festival Inc. (BRRTS No. 03-41-557220), a leaking underground storage tank site. The COCs at these sites include PAHs, semivolatile organic compounds, VOCs, metals, and cyanide.

Design activities for fish habitat restoration (Figure 3-1) within Quiet Water Basin were completed by Ramboll in April 2020 and permitting requirements are being established (Ramboll 2020). The design consists of a spawning bed, a gravel bed, log structures on the north side, and inverted root wads on the southern side of the basin. Sediment samples collected under this project within Summerfest Lagoon will be used for the implementation of this project.

3 Methods of Site Investigation

Both site surveys and sediment sampling were performed as part of the site investigation.

3.1 Site Surveys

Surveys were performed to assess site conditions from above with aerial photography, underwater with bathymetric and side-scan sonar surveys, and along the shoreline with mobile Light Detection and Ranging (LiDAR).

A drone survey was performed on August 26 and 27, 2020, prior to commencing sediment investigations. Both days featured excellent flight conditions with clear, sunny skies and light wind coming from the west. Aerial overhead video footage was collected for each project area on the KK River and Milwaukee Bay, including the Summerfest Lagoon by a Federal Aviation Administration-certified remote pilot using a small unmanned aerial system (UAS; DJI Phantom 4 Professional). Video footage for each area was collected from both upstream and downstream views. In addition to the video footage, aerial photographs of picturesque features within the area were captured with the UAS. Both UAS video footage and aerial photographs are provided in the SIR for the KK River and Milwaukee Bay (Anchor QEA 2021).

Bathymetric, side-scan sonar, and mobile LiDAR surveys were conducted of the Milwaukee Harbor, the KK River, Menomonee River, Milwaukee River, and portions of the Milwaukee Bay, including the Summerfest Lagoon, from September 1 through November 19, 2020, to provide site characterization of the sediment surface elevations and shoreline. The bathymetric survey was conducted with a multibeam echosounder, R2Sonic 2022, to measure the bottom elevations and underwater features, using a high-resolution swath of 256 beams. The side-scan sonar survey was performed using an Edgetech 4125 side-scan sonar with 600/1,600 kilohertz, dual-frequency system for high-resolution search and mapping applications. The LiDAR survey was collected with a Renishaw SLM Mobile LiDAR Scanner. Along the shoreline between the Summerfest Lagoon and the mouth of the Milwaukee River, optimal density could not be achieved due to consistently rough conditions during the LiDAR phase of the operation. The bathymetry is included in Figures 5-1 and 5-2. Additional mapping and imagery are included in the SIR for the KK River and Milwaukee Bay (Anchor QEA 2021).

3.2 Sediment Sampling

Sediment sampling activities within the Summerfest Lagoon were conducted on September 1, 2, and 22, 2020. Sediment cores were collected at a total of 13 targeted locations within the Summerfest Lagoon; the sediment sampling locations are shown in Figure 3-1.

Sediment cores were collected using a pneumatic drivecore unit operating from a 25-foot pontoon vessel. Cores were advanced until refusal was met with the goal of reaching the native grey silty clay, as described by Arcadis (2016), in the bottom portion of the core. Up to three attempts were made to achieve the specified recovery (i.e., 70%). The core recovery of 70% was achieved at all 13 locations. Table 3-1 (attached) summarizes the Summerfest Lagoon sediment sampling location information, including horizontal position, collection date, water depth, mudline elevation, core penetration depth, recovery, and depth and elevation of native grey silty clay (where encountered). Photographs of sediment sampling activities are presented in Appendix A, and field documentation is provided in Appendix B.

Collected sediment cores were transported to a landside core processing area to facilitate concurrent core processing during field activities. Prior to opening each core, cores were photographed and weighed. Bulk density (Table 3-1) was calculated using the weight of the sediment within the core, recovered sediment volume, and total length of recovered sediment. Sediment cores were then split longitudinally, screened with a photoionization detector (PID), logged using the Unified Soil Classification System, and then photographed. Photographs of core processing are presented in Appendix A. The sediment core logs, in Appendix C, present the lithology, sampled depth intervals, PID, torvane, and pocket penetrometer readings. After the lithologic logging was completed, sediment cores were subsampled. Subsampling targeted depth intervals from 0 to 1.0 foot, and 2-foot depth intervals thereafter. Native grey silty clays, when encountered, were segmented separately, and not homogenized with overlying sediments. Following sampling, equipment was decontaminated, and excess sampling materials (i.e., investigation-derived waste) were categorized and disposed in accordance with the FSP and QAPP.

3.3 Quality Control

Field quality assurance/quality control samples were collected at the required frequencies, with the exception of trip blanks. One trip blank was submitted with the samples collected on September 23, 2020, and no trip blanks were submitted with samples collected September 1, 2, and 3, 2020. Two field duplicate samples and one replicate sample were collected from the Summerfest Lagoon area and submitted for chemical analyses to demonstrate field precision. Field duplicate and replicate results for physical and chemical analyses are presented in Tables 5-1 through 5-5 (attached). Equipment rinsate blanks were collected and analyzed to evaluate potential cross-contamination and evaluated and reported as part of the data usability assessment (Anchor QEA 2021).

Data deliverables were provided by the laboratories in the required formats. Data completeness was assessed by comparing the chain-of-custody forms and QAPP to the dataset. The laboratory followed the specified analytical methods, and all requested sample analyses were completed. All relevant records, correspondence, reports, logs, data, field logs, photographs, analytical data, and any other documentation were reviewed and evaluated. Analytical completeness is a measure of the

amount of data determined to be valid in proportion to the amount of data collected. Three mercury results for one field duplicate and two sediment samples were rejected due to no or very low recoveries in the associated matrix spike and matrix spike duplicate. Overall, analytical completeness goals were met.

4 Testing and Measurement Protocols

4.1 Analytical Methods

This section briefly describes the analytical methods used to generate the physical and chemical data for the sediment samples discussed in this Tech Memo, as well as any deviations by the laboratory from the analytical methods or procedures listed in the QAPP (Appendix B of the FSP; Anchor QEA 2020).

4.1.1 Chemical Analyses of Sediment Samples

Sediment samples were analyzed for metals, PAHs, VOCs, polychlorinated biphenyl (PCB) Aroclors, cyanide, and total organic carbon (TOC) using the following methods:

- Total metals by EPA Methods 6020, 7470A, and 7471B
- PAHs by EPA Method 8270D
- VOCs by EPA Method 8260B
- PCB Aroclors by EPA Method 8082A
- Total cyanide by EPA Method 9012B
- TOC by Lloyd Kahn

The laboratory followed the methods listed in the QAPP and all requested sample analyses were completed. Eurofins TestAmerica (ETA) in Chicago, Illinois, conducted the VOC analyses and all other analyses were conducted by ETA in Pittsburgh, Pennsylvania. ETA laboratories are DNR and National Environmental Laboratory Accreditation Program accredited, as required per analytical method.

Results were reported using the laboratory sample-specific method detection limits, and detection limits for results below detection were below project screening levels.

4.1.2 Physical Analyses of Sediment Samples

Sediment physical analyses were conducted by ETA in Burlington, Vermont. Samples were analyzed for the following:

- Grain size by ASTM International (ASTM) D422
- Atterberg limits by ASTM D4318
- Moisture content by ASTM D2216
- Specific gravity by ASTM D854

The laboratory followed the methods specified in the QAPP, and all sample analyses were completed.

4.2 Calculation of Total PAHs and Total PCBs

Total PAHs[2] and total PCB Aroclors were calculated using two methods to bound the total values based on non-detect assumptions. Chemicals that were not detected were reported as the detection limit and assigned a U-qualifier. Totals were calculated by summing the reported values, with non-detects treated as zero values (U=0) or non-detect values treated as one-half of the detection limit (U=1/2). If all results were below detection, the highest detection limit was reported with a U-qualifier to indicate the total is below detection. Non-detect values treated as one-half the detection limit tend to produce results that are biased high. This method (U=1/2) is considered more conservative and, therefore, was utilized for the evaluation and discussion of total PAH and total PCB results within this Tech Memo.

4.3 Sediment Quality Guidelines and Screening Criteria

Sediment results were tabulated and evaluated against screening levels identified in the QAPP (Appendix B of the FSP; Anchor QEA 2020). These screening levels are based on the *Consensus-Based Sediment Quality Guidelines, Recommendations for Use and Application* (DNR 2003), as well as specific total PCB criteria provided by DNR. Metal, PAH, and VOC[3] results were screened against the probable effects concentration (PEC), three times the PEC, and five times the PEC. Total PCBs were screened against 1 milligram per kilogram (mg/kg), 5 mg/kg, and 50 mg/kg.

Currently, DNR does not have a sediment screening value for cyanide. As such, sediment results were evaluated against the DNR's residual contaminant levels (RCLs) for soils as presented in Chapter NR 720 of Wisconsin Administrative Code and provided in DNR's *Soil Residual Contaminant Level Determinations Using the U.S. EPA Regional Screening Level Web Calculator* (DNR 2014). The RCLs are for upland soils and are, therefore, not applicable to sediment. Contaminants in sediment have different characteristics than from when they are in soils, which include the potential harm to aquatic life such as benthos and fish. Thus, screening levels for contaminants in sediment may be higher or lower than their respective soil RCLs. RCLs for cyanide are presented in this Tech Memo for comparative purposes only. For a complete analysis, screening levels for cyanide would have to be adopted from an agency outside of the DNR, or site-specific values calculated; both of which are outside of the scope of this project.

[2] Total PAHs includes: 2-methylnaphthalene, 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, naphthalene, phenanthrene, and pyrene.

[3] DNR (2003) provides PEC values for seven VOCs including benzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, naphthalene, toluene, 1,2,4-trichlorobenzene, and total xylenes.

5 Investigation Results

This section summarizes the physical and chemical results for the sediment sample investigation. Sediment sampling locations are depicted in Figure 3-1. Results are summarized in Tables 5-1 through 5-5 (attached). Laboratory data packages are available in the SIR for the KK River and Milwaukee Bay (Anchor QEA 2021).

5.1 Physical Analysis of Sediments

5.1.1 Physical Observations

Sediments within the Maritime Basin of the Summerfest Lagoon comprise clayey silts, whereas sediments within the Quiet Water Basin comprise a mixture of clayey silts and silty sands. North and east of the Summerfest Lagoon, the sediments are generally sands or sands overlying clay (MKE-20-080, MKE-20-081, MKE-20-092, MKE-20-094, and MKE-20-095 in Figure 3-1). Recovered sediment thickness ranged from 1.1 feet at MKE-20-081 to 5.7 feet at MKE-20-090, with an average of 2.9 feet.

There were no observed sheens or odors at any sediment sampling locations within the Summerfest Lagoon area. Detailed sediment core logs for each location are provided in Appendix C.

5.1.2 Geotechnical Properties

Geotechnical properties were assessed at one of the 13 sediment locations within the Summerfest Lagoon area. Two samples were collected and analyzed from location MKE-20-088 (Figure 3-1). Geotechnical testing consisted of moisture content, Atterberg limits, specific gravity, and particle size analysis by ETA. Table 5-1 (attached) provides a summary of the geotechnical engineering properties. The sediments at location MKE-20-088 had a moisture content of 30.7% at the surface (0 to 1 foot) and 21.4% in the subsurface (1 to 3 feet). The sediments consisted predominantly of fine sand-sized particles (52.9% to 79.5%) and are considered non-plastic.

5.1.3 Total Organic Carbon

A total of 23 TOC samples (including one field duplicate) were collected and analyzed in 8 of the 13 sediment core locations. TOC results are presented, along with the PAH results, in Table 5-2 (attached). Of the 23 samples analyzed, the average TOC was 3.9%. The percentage of TOC ranged from 1.99% to 6.78%, with higher TOCs generally observed in the surface sediments.

5.2 Analytical Results

To assess the degree of potential sediment contamination, analytical results were evaluated against the screening criteria listed in Section 4.3. Results of the screening are presented in Tables 5-2 through 5-5 (attached).

5.2.1 Metals

All 13 core locations within the Summerfest Lagoon area were sampled for arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc (Table 5-3, attached). A total of 32 samples, including one field replicate and two field duplicates, were collected and analyzed. Of the metals analyzed, only concentrations of cadmium and chromium exceeded the PEC (Table 5-6). The PEC for cadmium (5 mg/kg) was exceeded at two locations, MKE-20-084 and MKE-20-090, in three samples (Figures 5-1 and 5-2). These locations were in both the Maritime Basin and Quiet Water Basin. Overall, these cadmium concentrations were well below the cadmium concentration detected in the KK River (i.e., maximum cadmium concentrations of 40 to 120 mg/kg were detected in each reach of the KK River; Anchor QEA 2021) and similar to cadmium concentrations detected near the Port of Milwaukee (i.e., maximum cadmium concentration of 12.8 mg/kg was detected near the Port of Milwaukee; Anchor QEA 2021).

The chromium concentrations within the Summerfest Lagoon ranged from 4.3 to 418 mg/kg. The PEC for chromium (110 mg/kg) was exceeded at the same two locations as cadmium along with MKE-20-091 (Figures 5-1 and 5-2). At these locations, a total of four samples exceeded the PEC, one of which exceeded the PEC by at least a factor of 3 (Table 5-2, attached). Similar to cadmium, chromium concentrations within the Summerfest Lagoon were below concentrations detected within the KK River, with the maximum chromium concentration in the Summerfest Lagoon more than 10 times less than the maximum concentration in the KK River (Anchor QEA 2021).

In all cases, the cadmium and chromium concentrations exceeding the PEC were in the subsurface (deeper than 1 foot).

Table 5-6

Summary of Metal Concentrations and PEC Exceedance Frequency

Contaminant	PEC (mg/kg)	Concentrations (mg/kg)	PEC Exceedance Frequency
Arsenic	33	0.91 – 8.2	0 of 29 (0%)
Cadmium	5	0.028 – 10.2	3 of 29 (10%)
Chromium	110	4.3 – 418	4 of 29 (14%)
Copper	150	3.6 – 61.2	0 of 29 (0%)
Lead	130	2.2 – 105	0 of 29 (0%)
Mercury	1.1	0.012 – 1	0 of 27 (0%)

Contaminant	PEC (mg/kg)	Concentrations (mg/kg)	PEC Exceedance Frequency
Nickel	49	3.6 – 26.1	0 of 29 (0%)
Zinc	460	13.3 – 340	0 of 29 (0%)

Notes:

See Table 5-3, attached, for individual results within the Summerfest Lagoon area.

For PEC exceedance frequency, the value in parentheses is the frequency exceedance percentage. Field duplicates and field replicates were not included in the exceedance frequencies.

Two mercury results were rejected due to no or very low recoveries in the associated matrix spike and matrix spike duplicate.

5.2.2 Cyanide

In addition to the metals, cyanide was analyzed at all 13 locations in the Summerfest Lagoon area. A total of 32 samples (including two field duplicates and one field replicate) were analyzed. Cyanide concentrations ranged from not detected (with detection limit of 0.068 mg/kg) to 2.1 mg/kg (Table 5-3, attached). Cyanide was detected in 13 samples (including one field duplicate) from eight of the thirteen locations. Although there is no sediment PEC for comparison with cyanide, detected concentrations of cyanide were compared to the DNR's non-industrial, not-to-exceed direct contact RCL (D-C RCL; 27.1 mg/kg) and RCL that is protective of groundwater quality (GW RCL; 2.02 mg/kg). Cyanide concentrations in all samples were below the D-C RCL and only one sample (MKE-20-084) located at the southern end of the Quiet Water Basin exceeded the GW RCL (Table 5-7).

Table 5-7

Summary of Cyanide Concentrations and Screening Level Exceedance Frequency

Contaminant	Cyanide Concentrations (mg/kg)	D-C RCL Exceedance Frequency	GW RCL Exceedance Frequency
Cyanide	ND – 2.1	0 of 29 (0%)	1 of 29 (3%)

Notes:

See Table 5-3, attached, for individual results within the Summerfest Lagoon area.

For screening level exceedance frequency, the value in parentheses is the frequency exceedance percentage. Field duplicates and field replicates were not included in the exceedance frequencies.

DNR's D-C RCL is 27.1 mg/kg.

DNR's GW RCL is 2.02 mg/kg.

5.2.3 Total PAHs

Total PAHs was calculated using two methods to bound the total values based on non-detect assumptions: by summing all detected values with non-detects treated as zero values (U=0) and by summing all detected values and using a value equal to one-half (U=1/2) the reporting limit for non-detects (see Section 4.2 for list of PAHs analyzed). It is more conservative to evaluate non-detect values as one-half the detection limit, therefore, that was the method used in evaluating the results.

Total PAHs within the Summerfest Lagoon area ranged from not detected to 42 mg/kg (Table 5-8). The PEC for total PAHs (22.8 mg/kg) was exceeded at three locations (MKE-20-084, MKE-20-090, and MKE-20-091) in a total of four samples. Each of these locations and samples was coincident with PEC exceedances of chromium located in the subsurface (Figures 5-1 and 5-2). Further, when reviewing the individual PAH compounds in Table 5-2 (attached), concentrations of 10 chemicals (acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(e)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, phenanthrene, and pyrene) most frequently exceeded the individual PECs.

Table 5-8
Summary of PAH Concentrations and PEC Exceedance Frequency

Contaminant	PEC (mg/kg)	Concentrations (mg/kg)	PEC Exceedance Frequency
Total PAHs	22.8	ND – 42	4 of 29 (14%)

Notes:
See Table 5-2, attached, for individual results within the Summerfest Lagoon area.
For PEC exceedance frequency, the value in parentheses is the frequency exceedance percentage. Field duplicates and field replicates were not included in the exceedance frequencies.

Overall, total PAH concentrations of sediment in the Summerfest Lagoon are similar in concentration to sediments in the outer harbor and more than 10 times lower than the total PAH concentrations detected in the KK River (Anchor QEA 2021).

5.2.4 Total PCBs

Total PCBs was calculated using two methods to bound the total values based on non-detect assumptions: by summing all detected values with non-detects treated as zero values (U=0) and by summing all detected values and using a value equal to one-half (U=1/2) the reporting limit for non-detects. Similar to total PAHs, it is more conservative to evaluate non-detect values as one-half the detection limit, therefore, that was the method utilized in evaluating the results.

All 13 locations within the Summerfest Lagoon area were analyzed for PCB Aroclors. The concentrations of total PCB Aroclors within the Summerfest Lagoon area ranged from not detected to 4.1 mg/kg[4] (Table 5-9). Total PCB Aroclor concentrations were screened against three values—1 mg/kg, 5 mg/kg, and 50 mg/kg. Only two samples at two locations (MKE-20-084 and MKE-20-090) exceeded the screening criteria of 1 mg/kg (Figures 5-1 and 5-2). The total PCB Aroclors at these locations comprise Aroclors 1248 and 1260 (Table 5-4, attached).

[4] The field duplicate for MKE-20-090 1 to 3 feet resulted in a total PCBs Aroclor value of 4.2 mg/kg.

Table 5-9
Summary of PCB Aroclor Concentrations and Screening Value Exceedance Frequency

Contaminant	Screening Value (mg/kg)	Concentrations (mg/kg)	1 mg/kg Exceedance Frequency	5 mg/kg Exceedance Frequency	50 mg/kg Exceedance Frequency
Total PCB Aroclors	1	ND (0.0034) – 4.1	2 of 29 (7%)	0 of 29 (0%)	0 of 29 (0%)

Notes:
See Table 5-4, attached, for individual results within the Summerfest Lagoon area.
Total PCB Aroclor concentrations were screened against screening criteria of 1 mg/kg, 5 mg/kg, and 50 mg/kg.
For screening criteria exceedance frequency, the value in parentheses is the frequency exceedance percentage. Field duplicates and field replicates were not included in the exceedance frequencies.
ND = not detected, with the detection limit noted in parentheses

5.2.5 Total VOCs

VOCs were analyzed in a total of 33 samples (including one field replicate and two field duplicates) at 13 locations within the Summerfest Lagoon area. The VOC results are provided in Table 5-5. The results were screened against PECs for three detected chemicals—naphthalene, toluene, and xylene. Only one sample, MKE-20-084, exceeded the PEC of total xylene (Table 5-5, attached).

6 Conclusions

This Tech Memo presents the results of sediment concentrations in the Summerfest Lagoon and adjacent shoreline areas. In general, metal, PCB, and PAH concentrations in the Summerfest Lagoon were lower than other parts of the MKE AOC (e.g., KK River, South Menomonee Canal) and similar to concentrations of sediment in the outer harbor near the Summerfest Lagoon and Port of Milwaukee.

In particular, based on the data collected during this investigation, four samples at three locations within the Summerfest Lagoon (MKE-20-84, MKE-20-90, and MKE-20-91) consistently exceeded the screening criteria for various chemicals (e.g., cadmium, chromium, total PAHs, total PCBs, and total xylene). As shown in Figures 5-1 and 5-2 (attached), two of these samples are located within the Maritime Basin, whereas the third sample is located at the southernmost location in the Quiet Water Basin coincident with a proposed woody habitat feature (Ramboll 2020). In all cases, the samples with concentrations exceeding screening values were found at depth (deeper than 1 foot below sediment surface) and were overlain with surface sediments with concentrations 3 to 10 times less than those at depth.

As noted, DNR does not have a sediment screening value for cyanide so data were compared to DNR's RCLs (i.e., D-C RCL and GW RCL). Cyanide concentrations were all below the D-C RCL and only one sample exceeded the GW RCL. However, for context, the concentration trends for cyanide within the Summerfest Lagoon were similar to the metals, PCBs, and PAHs. Where total cyanide was detected, the highest detectable concentrations (i.e., 2.1 mg/kg at MKE-20-084 from depth interval 1 to 2.6 feet) were present in the subsurface. Thus, the exposure pathway for benthos and fish potentially may be limited but would have to be further evaluated outside the scope of this project.

Future sediment work in the Summerfest Lagoon and adjacent shoreline areas needs to take into consideration planned AOC habitat features. Depending on the need for sediment remediation in the Milwaukee Bay, these habitat features could be impacted if constructed beforehand. Coordination between all involved parties is recommended.

7 References

Anchor QEA (Anchor QEA, LLC), 2020. *Field Sampling Plan*. Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee River Estuary Area of Concern. Prepared on behalf of DNR and EPA GLNPO. August 2020.

Anchor QEA, 2021. *90% Draft Site Investigation Report.* Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern. Prepared on behalf of DNR and EPA GLNPO. March 2021.

Arcadis, 2016. *Remedial Investigation Report*. Milwaukee Solvay Coke & Gas Site. Prepared for U.S. Environmental Protection Agency. Prepared on behalf of the Milwaukee Solvay Coke & Gas Site RI/FS Group. August 22, 2016.

DNR (Wisconsin Department of Natural Resources), 2003. *Consensus-Based Sediment Quality Guidelines, Recommendations for Use and Application.* December 2003.

DNR, 2014. *Soil Residual Contaminant Level Determinations Using the U.S. EPA Regional Screening Level Web Calculator*. PUB-RR-890. Available at: https://dnr.wi.gov/files/pdf/pubs/rr/RR890.pdf. January 23, 2014.

Ramboll, 2020. *Lakeshore State Park Quiet Water Basin Fish Habitat Improvement, Summerfest Lagoon Project*. Drawings. Draft Final Design Submittal. August 10, 2020.

Tables (attached)

Table 3-1
Summerfest Lagoon – Sediment Sampling Summary

Sampling Area and Reach	Location ID	Sample Coordinates		Collection Date	Field Bulk Density (lb/ft^3)	Water Depth (feet)	Mudline Elevation[2] (feet)	Core Penetration Depth (feet)	Recovered Sediment Core Length (feet)	% Recovery	Core Refusal Elevation (feet)	Depth to Native Material Below Mudline (feet)	Native Material Elevation[3] (feet)	Laboratory Analysis Summary										
		Northing[1]	Easting[1]											Atterberg Limits	Specific Gravity	Moisture Content	Particle Size	Total Solids	Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	VOCs	Cyanide	Total Organic Carbon	PAHs	PCB Aroclors
Summerfest Lagoon	MKE-20-080	386741.733	2531763.524	9/22/2020	115.6	14.3	567.4	2.3	2.0	87%	565.1	NE	NE					•	•	•	•		•	•
	MKE-20-081	385854.443	2531336.539	9/22/2020	107.1	12.9	569.0	1.2	1.1	92%	567.8	NE	NE					•	•	•	•		•	•
	MKE-20-084	382198.713	2530838.704	9/1/2020	100.1	22.7	559.8	5	4.7	94%	554.8	2.6	557.2					•	•	•	•	•	•	•
	MKE-20-085	382555.757	2530734.403	9/1/2020	121.8	16.6	565.5	2.5	2.5	100%	563.0	NE	NE					•	•	•	•	•	•	•
	MKE-20-086	382802.280	2530960.648	9/1/2020	125.8	18.1	564.2	2.7	2.7	100%	561.5	NE	NE					•	•	•	•	•	•	•
	MKE-20-087	383040.580	2530591.860	9/1/2020	119.5	15.4	566.7	4.4	4.3	98%	562.3	1.4	565.3					•	•	•	•	•	•	•
	MKE-20-088	383590.075	2530767.729	9/1/2020	130.7	14.0	568.2	4.6	4.1	89%	563.6	NE	NE					•	•	•	•	•	•	•
	MKE-20-088-G	383590.075	2530767.729	9/1/2020	130.7	14.0	568.2	3.9	3.0	77%	564.3	NE	NE	•	•	•	•	•	•	•	•	•	•	•
	MKE-20-089	384250.394	2530998.067	9/2/2020	126.7	16.3	565.4	1.7	1.7	100%	563.7	0	565.4					•	•	•	•	•	•	•
	MKE-20-090	384764.321	2530864.225	9/2/2020	104.1	19.0	562.9	6	5.7	95%	556.9	NE	NE					•	•	•	•	•	•	•
	MKE-20-091	384916.373	2531373.512	9/2/2020	97.9	23.7	558.5	4.3	4.3	100%	554.2	3.1	555.4					•	•	•	•	•	•	•
	MKE-20-092	383748.089	2531538.261	9/22/2020	112.2	19.4	562.7	2.2	1.9	86%	560.5	1.2	561.5					•	•	•	•		•	•
	MKE-20-094	382714.647	2531885.658	9/22/2020	105.9	22.1	560.2	2	1.8	90%	558.2	NE	NE					•	•	•	•		•	•
	MKE-20-095	381962.940	2531381.957	9/22/2020	141.6	20.6	561.6	1.2	1.2	100%	560.4	0	561.6					•	•	•	•		•	•

Notes:
1. Horizontal Datum: Wisconsin State Plane, South Zone, North American Datum of 1983, U.S. Feet
2. Vertical Datum: International Great Lakes Datum of 1985; mudline elevations are based on bathymetric survey results
3. Native material has previously been defined as a silty clay (Arcadis 2016)

Abbreviations:
As, Cd, Cr, Cu, Pb, Hg, Ni, Zn: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc
lb/ft^3: pounds per cubic foot
NE: not encountered; the native material as described in Arcadis 2016 was not encountered
PAH: polycyclic aromatic hydrocarbon
PCB: polychlorinated biphenyl
VOC: volatile organic carbon

Reference:
Arcadis (Arcadis U.S., Inc), 2016. *Remedial Investigation Report.* Milwaukee Solvay Coke & Gas Site. Prepared for U.S. Environmental Protection Agency. Prepared on behalf of the Milwaukee Solvay Coke & Gas Site RI/FS Group. August 22, 2016.

Table 5-1
Physical Summary

Location ID	Sample ID	Date	Depth Interval (ft bss)	Liquid Limit (unitless)	Plastic Limit (unitless)	Plasticity Index (unitless)	Moisture (Water) Content (percent)	Specific Gravity (unitless)	Gravel (percent)	Coarse Sand (percent)	Medium Sand (percent)	Fine Sand (percent)	Silt (percent)	Clay (percent)	Percent Passing 3 inches (3-inch sieve) (percent)	Percent Passing 2 inches (2-inch sieve) (percent)	Percent Passing 1.5 inches (1.5-inch sieve) (percent)	Percent Passing 1 inch (1-inch sieve) (percent)
MKE-20-088-G	MKE-20-088-G-00-01-200902	9/2/2020	0 - 1	0 U	0 U	0 U	30.7	2.76	10.4	2	2.8	52.9	25.6	6.3	100	100	100	100
MKE-20-088-G	MKE-20-088-G-01-03-200902	9/2/2020	1 - 3	0 U	0 U	0 U	21.4	2.78	0.1 U	0.1 U	2	79.5	16.6	1.9	100	100	100	100

Abbreviations:
ft bss: feet below sediment surface
U: indicates the compound analyzed for but not detected above detection limit

Table 5-1
Physical Summary

Location ID	Sample ID	Date	Percent Passing 0.75 inch (3/4-inch sieve) (percent)	Percent Passing 0.375 inch (3/8-inch sieve) (percent)	Percent Passing 4,750 microns (Sieve #4) (percent)	Percent Passing 2,000 microns (Sieve #10) (percent)	Percent Passing 850 microns (Sieve #20) (percent)	Percent Passing 425 microns (Sieve #40) (percent)	Percent Passing 250 microns (Sieve #60) (percent)	Percent Passing 180 microns (Sieve #80) (percent)	Percent Passing 150 microns (Sieve #100) (percent)	Percent Passing 75 microns (Sieve #200) (percent)	Percent Passing (Hydrometer 1) (percent)	Percent Passing (Hydrometer 2) (percent)
MKE-20-088-G	MKE-20-088-G-00-01-200902	9/2/2020	100	94	89.6	87.6	86.3	84.8	81.7	78.3	73.7	31.9	15.5	12.1
MKE-20-088-G	MKE-20-088-G-01-03-200902	9/2/2020	100	100	100	100	99.5	98	94.8	91.3	87.5	18.5	6.8	4.1

Abbreviations:
ft bss: feet below sediment surface
U: indicates the compound analyzed for but not detected above detection limit

Table 5-1
Physical Summary

Location ID	Sample ID	Date	Percent Passing (Hydrometer 3) (percent)	Percent Passing (Hydrometer 4) (percent)	Percent Passing (Hydrometer 5) (percent)	Percent Passing (Hydrometer 6) (percent)	Percent Passing (Hydrometer 7) (percent)
MKE-20-088-G	MKE-20-088-G-00-01-200902	9/2/2020	8.3	7.3	6.3	4.9	3.9
MKE-20-088-G	MKE-20-088-G-01-03-200902	9/2/2020	2.8	2.3	1.9	1.4	1

Abbreviations:
ft bss: feet below sediment surface
U: indicates the compound analyzed for but not detected above detection limit

Table 5-2
Analytical Results for Total PAHs and TOC

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No.	2-Methylnaphthalene (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)
				PEC	91-57-6	83-32-9	208-96-8	120-12-7	56-55-3	50-32-8	205-99-2	192-97-2	191-24-2
				PECx3	0.201	0.089	0.128	0.845	1.05	1.45	13.4	1.45	3.2
				PECx5	0.603	0.267	0.384	2.535	3.15	4.35	40.2	4.35	9.6
					1.005	0.445	0.64	4.225	5.25	7.25	67	7.25	16
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		**0.062 J**	**0.14**	**0.18**	**0.36**	**0.99**	**0.98**	**0.93**	**0.55 J**	**0.55**
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		**0.016 J**	**0.07**	**0.09**	**0.14**	**0.34**	**0.33**	**0.26**	**0.17 J**	**0.2**
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		**0.013 J**	**0.06**	**0.036 J**	**0.14**	**0.33**	**0.29**	**0.29**	**0.18 J**	**0.18**
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		0.011 U	**0.03 J**	**0.023 J**	**0.08**	**0.25**	**0.24**	**0.3**	**0.17 J**	**0.2**
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		**0.18**	**0.28**	**0.32**	**0.84**	**2.5**	**2.4**	**2.9**	**1.8**	**1.9**
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7 ft		0.0094 U	**0.08**	0.0086 U	**0.029 J**	**0.023 J**	0.017 U	0.0097 U	0.027 U	0.0085 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		0.011 U	**0.019 J**	**0.019 J**	**0.041 J**	**0.16**	**0.18**	**0.25**	**0.15 J**	**0.18**
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		0.0096 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0098 U	0.027 U	0.0086 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		0.015 U	**0.021 J**	**0.053 J**	**0.06**	**0.25**	**0.28**	**0.4**	**0.23 J**	**0.26**
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		0.0095 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0097 U	0.027 U	0.0085 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		**0.01 J**	**0.08**	**0.027 J**	**0.19**	**0.42**	**0.32**	**0.35**	**0.21**	**0.24**
MKE-20-087-C	*MKE-20-087-C-1.4-03-200902*	9/2/2020	1.4 - 3		0.0096 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0098 U	0.027 U	0.0086 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		0.0097 U	0.012 U	0.0088 U	0.01 U	0.018 U	0.017 U	**0.015 J**	0.027 U	0.0087 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		0.01 U	0.012 U	0.0093 U	0.011 U	**0.026 J**	**0.024 J**	**0.029 J**	0.029 U	**0.013 J**
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		0.0095 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0098 U	0.027 U	0.0086 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		0.0097 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
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		0.0099 U	0.012 U	0.009 U	0.011 U	0.019 U	0.018 U	0.01 U	0.028 U	0.0089 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		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
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		**0.041 J**	**0.14**	**0.091 J**	**0.34**	**1.1**	**1.1**	**1.4**	**0.75**	**0.7**
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		**0.12 J**	**0.42**	**0.26 J**	**1**	**3.1**	**3.1**	**4.1**	**2.1**	**2**
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		**0.12 J**	**0.42**	**0.24 J**	**1**	**3.1**	**3.2**	**4**	**2.3**	**2**
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		**0.15**	**0.29**	**0.21**	**0.81**	**1.8**	**1.6**	**1.8**	**1.1**	**1.4**
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		0.0096 U	**0.035 J**	0.0087 U	**0.07**	**0.12**	**0.1**	**0.12**	**0.067 J**	**0.06**
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		**0.036 J**	**0.079 J**	**0.073 J**	**0.19**	**0.61**	**0.65**	**0.79**	**0.47 J**	**0.63**
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		**0.095 J**	**0.31**	**0.23 J**	**0.76**	**2.1**	**2.1**	**2.4**	**1.3 J**	**1.7**
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		0.0095 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0097 U	0.027 U	0.0086 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		**0.018 J**	**0.044 J**	**0.06**	**0.1**	**0.32**	**0.35**	**0.37**	**0.23**	**0.22**
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		0.0097 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
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		0.094 U	0.11 U	**0.12 J**	**0.17 J**	**0.73**	**0.9**	**1.4**	**0.7 J**	**0.94**
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		0.0095 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0098 U	0.027 U	0.0086 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		0.0095 U	0.011 U	0.0087 U	0.01 U	0.018 U	0.017 U	0.0098 U	0.027 U	0.0086 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		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

Table 5-2
Analytical Results for Total PAHs and TOC

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No.	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-c,d)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Total PAHs (U = 0) (mg/kg)	Total PAHs (U = 1/2 maximum limit) (mg/kg)	TOC (percent)
				PEC	207-08-9	218-01-9	53-70-3	206-44-0	86-73-7	193-39-5	91-20-3	85-01-8	129-00-0	tPAH_0N	tPAH_N	--
				PECx3	13.4	1.29	0.135	2.23	0.536	3.2	0.561	1.17	1.52	22.8	22.8	--
				PECx5	40.2	3.87	0.405	6.69	1.608	9.6	1.683	3.51	4.56	68.4	68.4	--
					67	6.45	0.675	11.15	2.68	16	2.805	5.85	7.6	114	114	--
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		**0.37**	**0.93**	**0.2**	**1.5**	**0.12 J**	**0.47**	**0.18**	**0.92**	**1.9**	**11 J**	**11 J**	--
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		**0.12**	**0.31**	**0.08**	**0.49**	**0.05**	**0.16**	**0.04 J**	**0.27**	**0.59**	**3.7 J**	**3.7 J**	--
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		**0.13**	**0.3**	**0.08**	**0.62**	**0.05**	**0.15**	**0.033 J**	**0.4**	**0.69**	**4 J**	**4 J**	--
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		**0.12**	**0.27**	**0.09**	**0.51**	**0.038 J**	**0.18**	0.0091 U	**0.26**	**0.45**	**3.2 J**	**3.2 J**	3.03
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		**1.2**	**2.9**	**0.52**	**5.4**	**0.4**	**1.7**	**0.22**	**2.7**	**4.3**	**32**	**32**	5.9
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7 ft		0.012 U	**0.022 J**	0.025 U	**0.07**	**0.0081 J**	0.02 U	0.0077 U	**0.09**	**0.06**	**0.38 J**	**0.46 J**	3.16
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		**0.1**	**0.19**	**0.07**	**0.34**	**0.015 J**	**0.15**	**0.012 J**	**0.13**	**0.32**	**2.3 J**	**2.3 J**	5.03
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		0.012 U	0.022 U	0.025 U	0.011 U	0.0078 U	0.02 U	0.0078 U	0.011 U	0.0094 U	0.027 U	0.027 U	3.13
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		**0.13**	**0.32**	**0.11**	**0.44**	**0.021 J**	**0.24**	**0.014 J**	**0.14**	**0.44**	**3.4 J**	**3.4 J**	6.78
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		0.012 U	0.022 U	0.025 U	0.01 U	0.0078 U	0.02 U	0.0077 U	0.011 U	0.0094 U	0.027 U	0.027 U	3.2
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		**0.16**	**0.37**	**0.09**	**0.77**	**0.08**	**0.21**	**0.017 J**	**0.54**	**0.68**	**4.8 J**	**4.8 J**	4.86
MKE-20-087-C	*MKE-20-087-C-1.4-03-200902*	9/2/2020	1.4 - 3		0.012 U	0.022 U	0.026 U	0.011 U	0.0078 U	0.02 U	0.0078 U	0.011 U	0.0094 U	0.027 U	0.027 U	2.7
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		0.012 U	0.022 U	0.026 U	**0.032 J**	0.0079 U	0.02 U	0.0079 U	**0.021 J**	**0.032 J**	**0.1 J**	**0.2 J**	2.36
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		0.013 U	**0.028 J**	0.027 U	**0.05**	0.0083 U	0.021 U	0.0083 U	**0.031 J**	**0.05**	**0.25 J**	**0.32 J**	3.52
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		0.012 U	0.022 U	0.025 U	0.01 U	0.0078 U	0.02 U	0.0078 U	0.011 U	0.0094 U	0.027 U	0.027 U	3.32
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		0.012 U	0.022 U	0.026 U	0.011 U	0.0079 U	0.02 U	0.0078 U	0.011 U	0.0095 U	0.027 U	0.027 U	2.75
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		0.012 U	0.023 U	0.026 U	0.011 U	0.0081 U	0.021 U	0.008 U	0.011 U	0.0098 U	0.028 U	0.028 U	1.99
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		0.013 U	0.023 U	0.027 U	0.011 U	0.0083 U	0.021 U	0.0082 U	0.011 U	0.01 U	0.029 U	0.029 U	2.99
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		**0.47**	**1.2**	**0.23**	**2.5**	**0.15**	**0.65**	**0.12**	**1.3**	**2.5**	**15 J**	**15 J**	4.47
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		**1.2**	**3.5**	**0.65**	**7.3**	**0.53**	**1.9**	**0.2 J**	**3.8**	**6.5**	**42 J**	**42 J**	5.11
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		**1.4**	**3.5**	**0.66**	**7**	**0.53**	**1.7**	**0.2 J**	**3.9**	**7.2**	**42 J**	**42 J**	3.66
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		**0.8**	**2**	**0.44**	**3.6**	**0.43**	**1.1**	**0.2**	**2.4**	**2.9**	**23**	**23**	4.67
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		**0.06**	**0.13**	0.026 U	**0.28**	**0.029 J**	**0.05**	0.0078 U	**0.25**	**0.25**	**1.6 J**	**1.6 J**	3.79
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		**0.34**	**0.7**	**0.14**	**1.3**	**0.087 J**	**0.47**	**0.077 J**	**0.63**	**1.1**	**8.4 J**	**8.4 J**	5.49
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		**0.9**	**2.3**	**0.49**	**4.7**	**0.3**	**1.5**	**0.13 J**	**2.4**	**3.5**	**27 J**	**27 J**	5.26
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		0.012 U	0.022 U	0.025 U	0.01 U	0.0078 U	0.02 U	0.0077 U	0.011 U	0.0094 U	0.027 U	0.027 U	3.46
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		**0.15**	**0.35**	**0.09**	**0.56**	**0.05**	**0.19**	**0.044 J**	**0.3**	**0.62**	**4.1 J**	**4.1 J**	--
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		0.012 U	0.022 U	0.026 U	0.011 U	0.0079 U	0.02 U	0.0079 U	0.011 U	0.0096 U	0.027 U	0.027 U	--
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		**0.36 J**	**1**	**0.45**	**1.5**	**0.097 J**	**0.72**	**0.093 J**	**0.61**	**1.5**	**11 J**	**11 J**	--
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		0.012 U	0.022 U	0.025 U	0.01 U	0.0078 U	0.02 U	0.0077 U	0.011 U	0.0094 U	0.027 U	0.027 U	--
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		0.012 U	0.022 U	0.025 U	**0.011 J**	0.0078 U	0.02 U	0.0077 U	0.011 U	0.0094 U	**0.011 J**	**0.13 J**	--
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		0.013 U	0.023 U	0.027 U	0.011 U	0.0082 U	0.021 U	0.0082 U	0.011 U	0.0099 U	0.029 U	0.029 U	--

Table 5-2
Analytical Results for Total PAHs and TOC

Notes:
1. Validated results were screened against the PEC, 3xPEC, and 5xPEC. PEC were provided in DNR 2003.
2. DNR (Wisconsin Department of Natural Resources), 2003. *Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application* . Publication No. WT-732.
3. Total PAHs are the sum of 2-methylnaphthalene, acenapthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(e)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthenes, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, and pyrene.
4. Total PAHs were calculated by summing the result values, with non-detects treated as zero values (U=0) or non-detect values treated as one-half of the detection limit (U=1/2 maximum limit). If all results were below detection, the highest detection limit was reported with a U-qualifier to indicate the total is below detection. Non-detect values treated as one-half the detection limit tend to produce results that are biased high.
5. Sample intervals defined as native materials based on visual observations are shown in italics.

Screening Criteria:
Detected concentration is greater than PEC screening level
Detected concentration is greater than 3xPEC screening level
Detected concentration is greater than 5xPEC screening level
Bold: detected result

Abbreviations:
CAS: Chemical Abstracts System
DNR: Wisconsin Department of Natural Resources
FD: field duplicate sample
FR: field replicate sample
ft bss: feet below sediment surface
J: indicates an estimated value
mg/kg: milligrams per kilogram
PAH: polycyclic aromatic hydrocarbon
PEC: probable effects concentration
TOC: total organic carbon
U: indicates the compound analyzed for but not detected above detection limit

Table 5-3
Analytical Results for Metals and Cyanide

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC PECx3 PECx5	Arsenic (mg/kg) 7440-38-2 33 99 165	Cadmium (mg/kg) 7440-43-9 5 15 25	Chromium (mg/kg) 7440-47-3 110 330 550	Copper (mg/kg) 7440-50-8 150 450 750	Lead (mg/kg) 7439-92-1 130 390 650	Mercury (mg/kg) 7439-97-6 1.1 3.3 5.5	Nickel (mg/kg) 7440-02-0 49 147 245	Zinc (mg/kg) 7440-66-6 460 1380 2300	Cyanide (mg/kg) 57-12-5 -- -- --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		**3.6**	**0.45**	**26.5**	**10**	**29.5**	**0.22 J-**	**5.6**	**66.8**	0.079 UJ
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		**2.1**	**0.14**	**11.4**	**4.9**	**9.7**	**0.039 J-**	**4.1**	**45.1**	0.076 UJ
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		**2.9**	**0.66**	**19.6**	**7.7**	**22.6**	**0.091 J-**	**5.5**	**94**	**0.52 J-**
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		**4.2**	**0.48**	**30**	**19.4**	**32.7 J**	**0.02**	**14.5**	**67.4 J**	**0.23 J**
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		**7.5**	**9.4**	**418**	**54**	**90.7 J**	**1**	**17.6**	**332 J**	**2.1**
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		**1.5**	**0.055 J**	**5.9**	**6.2**	**3.1 J**	**0.012 U**	**7.2**	**18 J**	0.074 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		**1.9**	**0.6**	**24.9**	**12.8**	**18.9 J**	**0.06**	**6.2**	**80.8 J**	**0.13 J**
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		**0.91**	**0.028 J**	**5.5**	**5.1**	**2.3 J**	**0.013 U**	**6.4**	**13.3 J**	0.072 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		**2.2**	**0.79**	**30.3**	**18**	**27.7 J**	**0.06**	**8.8**	**84.3 J**	**0.18 J**
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		**2.2**	**0.07**	**8.1**	**9.5**	**5**	**0.013 U**	**9.6**	**23.7 J**	0.068 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		**2.2**	**0.5**	**16.9**	**7.5**	**17.3**	**0.03**	**5.3**	**66.8 J**	0.074 U
MKE-20-087-C	*MKE-20-087-C-1.4-03-200902*	9/2/2020	1.4 - 3		**2**	**0.058 J**	**6**	**6.6**	**3.4**	**0.013 U**	**7.3**	**17.7 J**	0.074 UJ
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		**2.5**	**0.12**	**5.3**	**5.3**	**6.4**	**0.012 U**	**4.6**	**39.8 J**	0.069 UJ
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		**1.7**	**0.19**	**7.6**	**7.4**	**9**	**0.013 U**	**4.9**	**53.1 J**	0.074 UJ
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		**2.1**	**0.1**	**4.3**	**3.6**	**2.2**	**0.012 U**	**3.6**	**32.5 J**	0.069 UJ
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		**1.3 J**	**0.04 J**	**6.5 J**	**6.3 J**	**3 J**	**0.012 U**	**7.5 J**	**15.9 J**	0.073 UJ
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		**2.9 J**	**0.1**	**13.3 J**	**14.5 J**	**7 J**	**0.065 U**	**17 J**	**36.2 J**	0.07 UJ
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		**4.6**	**0.14**	**19**	**20.9**	**9.1**	**0.013 U**	**25.8**	**52.3 J**	0.073 UJ
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		**3.1**	**0.79**	**37.7**	**18.6**	**36.5**	**0.1**	**8.9**	**93.9 J**	**0.18 J-**
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		**7.8**	**10.2**	**323**	**61.2**	**105 J**	**0.62**	**26.1**	**340**	**1.6 J-**
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		**6.7**	**7.3**	**251**	**47.6**	**91.5**	**0.7**	**20.5**	**269 J**	**1.7 J-**
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		**8.2**	**5.7**	**206**	**37.6**	**72.5 J**	**0.65**	**17**	**248**	**1.2 J-**
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		**2.7**	**0.47**	**14.6**	**7.7**	**14.2 J**	**0.15**	**5.6**	**58.9**	0.074 UJ
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		**3.3**	**1.2**	**52.9**	**23.5**	**36.9**	**0.11**	**10.8**	**99.2**	**0.17 J**
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		**6.1**	**3.2**	**216**	**45**	**88.2**	**0.29**	**19.1**	**205**	**1.2**
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		**4.4**	**0.18**	**11.3**	**14.3**	**8.4**	**0.012 U**	**13.3**	**50.3**	0.071 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		**2.4**	**0.36**	**18.6**	**12.3**	**12.9**	**0.07 J-**	**9.9**	**56.1**	0.087 UJ
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		**4**	**0.17**	**17**	**18.3**	**9.7**	**0.014 J-**	**20.8**	**45.5**	0.075 UJ
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		**4.1**	**1**	**56.8**	**36.9**	**42.8**	**0.16 J-**	**15.3**	**130**	**0.24 J**
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		**1.6**	**0.07**	**5.1**	**6.4**	**4**	**R**	**6.5**	**19.9**	0.072 UJ
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		**1.7**	**0.07**	**5.2**	**6.2**	**3.9**	**R**	**6.3**	**19.8**	0.074 UJ
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		**1.9**	**0.054 J**	**5.9**	**7.2**	**3.9**	**R**	**7.3**	**16.1**	**0.66 J-**

Table 5-3
Analytical Results for Metals and Cyanide

Notes:
1. Validated results were screened against the PEC, 3xPEC, and 5xPEC. PEC were provided in DNR 2003.
2. DNR (Wisconsin Department of Natural Resources), 2003. *Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application* . Publication No. WT-732.
3. Sample intervals defined as native materials based on visual observations are shown in italics.
4. Three mercury results (one field duplicate and two sediment samples) were rejected due to no or very low recoveries in the associated matrix spike and matrix spike duplicate.

Screening Criteria:
Detected concentration is greater than PEC screening level
Detected concentration is greater than 3xPEC screening level
Detected concentration is greater than 5xPEC screening level
Bold: detected result

Abbreviations:
CAS: Chemical Abstracts System
DNR: Wisconsin Department of Natural Resources
FD: field duplicate sample
FR: field replicate sample
ft bss: feet below sediment surface
J: indicates an estimated value
J-: indicates an estimated value with a potentially low bias
mg/kg: milligrams per kilogram
PEC: probable effects concentration
R: Rejected
U: indicates the compound analyzed for but not detected above detection limit
UJ: indicates the compound or analyte analyzed for but not detected and the specified limit reported is estimated

Table 5-4
Analytical Results for Total PCB Aroclors

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. 1 mg/kg 5 mg/kg 50 mg/kg	Aroclor 1016 (mg/kg)	Aroclor 1221 (mg/kg)	Aroclor 1232 (mg/kg)	Aroclor 1242 (mg/kg)	Aroclor 1248 (mg/kg)	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)	Aroclor 1262 (mg/kg)	Aroclor 1268 (mg/kg)	Total PCB Aroclors (U = 0) (mg/kg)	Total PCB Aroclors (U = 1/2 maximum limit) (mg/kg)
					12674-11-2	11104-28-2	11141-16-5	53469-21-9	12672-29-6	11097-69-1	11096-82-5	37324-23-5	11100-14-4	--	--
					1	1	1	1	1	1	1	1	1	1	1
					5	5	5	5	5	5	5	5	5	5	5
					50	50	50	50	50	50	50	50	50	50	50
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		0.0035 U	0.0038 U	0.0026 U	0.0016 U	**0.0095 J**	0.0032 U	0.003 U	0.0038 U	0.0014 U	**0.0095 J**	**0.021 J**
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		0.0034 U	0.0037 U	0.0025 U	0.0015 U	0.0025 U	0.0031 U	0.003 U	0.0037 U	0.0014 U	0.0037 U	0.0037 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		0.0036 U	0.004 U	0.0027 U	0.0016 U	**0.02**	0.0034 U	**0.0056 J**	0.0039 U	0.0015 U	**0.026 J**	**0.036 J**
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		0.0038 U	0.0041 U	0.0028 U	0.0017 U	**0.05**	0.0035 U	0.0033 U	0.0041 U	0.0016 U	**0.05**	**0.06**
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		0.0046 UJ	0.005 UJ	0.0034 UJ	0.0021 UJ	**3.7 J-**	0.0042 UJ	**0.38 J-**	0.005 UJ	0.0019 UJ	**4.1 J**	**4.1 J**
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		0.0032 U	0.0035 U	0.0024 U	0.0015 U	0.0024 U	0.003 U	0.0028 U	0.0035 U	0.0013 U	0.0035 U	0.0035 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		0.0037 U	0.004 U	0.0028 U	0.0017 U	**0.07**	0.0034 U	**0.01**	0.004 U	0.0015 U	**0.08**	**0.1**
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		0.0032 U	0.0035 U	0.0024 U	0.0014 U	0.0024 U	0.003 U	0.0028 U	0.0035 U	0.0013 U	0.0035 U	0.0035 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		0.005 U	0.0055 U	0.0038 U	0.0023 U	**0.07**	0.0046 U	**0.02**	0.0054 U	0.0021 U	**0.09**	**0.11**
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		0.0032 U	0.0034 U	0.0024 U	0.0014 U	0.0023 U	0.0029 U	0.0028 U	0.0034 U	0.0013 U	0.0034 U	0.0034 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		0.0035 U	0.0038 U	0.0026 U	0.0016 U	**0.09**	0.0032 U	0.003 U	0.0037 U	0.0014 U	**0.09**	**0.11**
MKE-20-087-C	*MKE-20-087-C-1.4-03-200902*	9/2/2020	1.4 - 3		0.0032 U	0.0035 U	0.0024 U	0.0015 U	0.0024 U	0.003 U	0.0028 U	0.0035 U	0.0013 U	0.0035 U	0.0035 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		0.0032 U	0.0035 U	0.0024 U	0.0015 U	**0.02**	0.003 U	**0.02**	0.0035 U	0.0013 U	**0.04**	**0.05**
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		0.0034 U	0.0037 U	0.0026 U	0.0015 U	**0.02**	0.0031 U	0.003 U	0.0037 U	0.0014 U	**0.02**	**0.03**
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		0.0032 U	0.0035 U	0.0024 U	0.0014 U	0.0024 U	0.003 U	0.0028 U	0.0035 U	0.0013 U	0.0035 U	0.0035 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		0.0033 U	0.0036 U	0.0025 U	0.0015 U	0.0025 U	0.0031 U	0.0029 U	0.0036 U	0.0014 U	0.0036 U	0.0036 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		0.0033 U	0.0036 U	0.0025 U	0.0015 U	0.0025 U	0.0031 U	0.0029 U	0.0036 U	0.0014 U	0.0036 U	0.0036 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		0.0035 U	0.0038 U	0.0026 U	0.0016 U	0.0026 U	0.0032 U	0.003 U	0.0038 U	0.0014 U	0.0038 U	0.0038 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		0.0039 U	0.0042 U	0.0029 U	0.0017 U	**0.2**	0.0036 U	**0.03**	0.0042 U	0.0016 U	**0.23**	**0.24**
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		0.045 U	0.049 U	0.034 U	0.02 U	**3.2**	0.041 U	**0.28**	0.049 U	0.019 U	**3.5**	**3.6**
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		0.0044 U	0.0048 U	0.0033 U	0.002 U	**3.9 J+**	0.0041 U	**0.3 J+**	0.0048 U	0.0018 U	**4.2 J**	**4.2 J**
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		0.0039 U	0.0043 U	0.0029 U	0.0018 U	**0.64**	0.0036 U	**0.08**	0.0042 U	0.0016 U	**0.72**	**0.73**
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		0.0033 U	0.0036 U	0.0025 U	0.0015 U	**0.02**	0.003 U	0.0029 U	0.0036 U	0.0014 U	**0.02**	**0.03**
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		0.0043 UJ	0.0046 UJ	0.0032 UJ	0.0019 UJ	**0.25 J-**	0.0039 UJ	**0.03 J-**	0.0046 UJ	0.0018 UJ	**0.28 J**	**0.29 J**
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		0.0049 UJ	0.0053 UJ	0.0037 UJ	0.0022 UJ	**0.47 J-**	0.0045 UJ	**0.052 J-**	0.0053 UJ	0.002 UJ	**0.52 J**	**0.54 J**
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		0.0032 U	0.0035 U	0.0024 U	0.0015 U	**0.0046 J**	0.003 U	0.0028 U	0.0035 U	0.0013 U	**0.0046 J**	**0.015 J**
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		0.0038 U	0.0041 U	0.0029 U	0.0017 U	**0.06**	0.0035 U	**0.026 J**	0.0041 U	0.0016 U	**0.088 J**	**0.099 J**
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		0.0033 UJ	0.0036 UJ	0.0025 UJ	0.0015 UJ	0.0024 UJ	0.003 UJ	0.0029 UJ	0.0036 UJ	0.0014 UJ	0.0036 UJ	0.0036 UJ
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		0.0065 UJ	0.0071 UJ	0.0049 UJ	0.0029 UJ	**0.13 J-**	0.006 UJ	**0.08 J-**	0.007 UJ	0.0027 UJ	**0.21 J**	**0.23 J**
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		0.0033 U	0.0035 U	0.0024 U	0.0015 U	0.0024 U	0.003 U	0.0029 U	0.0035 U	0.0013 U	0.0035 U	0.0035 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		0.0032 U	0.0035 U	0.0024 U	0.0014 U	0.0024 U	0.003 U	0.0028 U	0.0035 U	0.0013 U	0.0035 U	0.0035 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		0.0035 U	0.0038 U	0.0026 U	0.0016 U	0.0025 U	0.0032 U	0.003 U	0.0037 U	0.0014 U	0.0038 U	0.0038 U

Table 5-4
Analytical Results for Total PCB Aroclors

Notes:
1. Validated results were screened against the PEC, 3xPEC, and 5xPEC. PEC were provided in DNR 2003.
2. DNR (Wisconsin Department of Natural Resources), 2003. *Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application* . Publication No. WT-732.
3. Total PCBs are the sum of Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 1262, and Aroclor 1268.
4. Total PCBs were calculated by summing the result values, with non-detects treated as zero values (U=0) or non-detect values treated as one-half of the detection limit (U=1/2 maximum limit). If all results were below detection, the highest detection limit was reported with a U-qualifier to indicate the total is below detection. Non-detect values treated as one-half the detection limit tend to produce results that are biased high.
5. Sample intervals defined as native material based on visual observations are shown in italics.

Screening Criteria:
Detected concentration is greater than 1 mg/kg
Detected concentration is greater than 5 mg/kg
Detected concentration is greater than 50 mg/kg
Bold: detected result

Abbreviations:
CAS: Chemical Abstracts System
DNR: Wisconsin Department of Natural Resources
FD: field duplicate sample
FR: field replicate sample
ft bss: feet below sediment surface
J: indicates an estimated value
J-: indicates an estimated value with a potentially low bias
J+: indicates an estimated value with a potentially high bias
mg/kg: milligrams per kilogram
PCB: polychlorinated biphenyl
PEC: probable effects concentration
U: indicates the compound analyzed for but not detected above detection limit
UJ: indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	1,1,1,2-Tetrachloroethane (µg/kg) 630-20-6 --	1,1,1-Trichloroethane (µg/kg) 71-55-6 --	1,1,2,2-Tetrachloroethane (µg/kg) 79-34-5 --	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) (µg/kg) 76-13-1 --	1,1,2-Trichloroethane (µg/kg) 79-00-5 --	1,1-Dichloroethane (µg/kg) 75-34-3 --	1,1-Dichloroethene (µg/kg) 75-35-4 --	1,1-Dichloropropene (µg/kg) 563-58-6 --	1,2,3-Trichlorobenzene (µg/kg) 87-61-6 --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		52 U	42 U	44 U	51 U	39 U	46 U	44 U	33 U	51 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		48 U	39 U	41 U	48 U	37 U	43 U	40 U	31 U	47 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		59 U	49 U	51 U	59 U	45 U	53 U	50 U	38 U	59 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		120 U	96 U	100 U	120 U	89 U	100 U	98 U	75 U	120 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		110 U	94 U	98 U	110 U	87 U	100 U	96 U	74 U	110 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		50 U	41 U	43 U	49 U	38 U	44 U	42 U	32 U	49 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		78 U	64 U	67 U	78 U	59 U	69 U	66 U	50 U	77 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		44 U	36 U	38 U	44 U	34 U	39 U	37 U	28 U	44 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		98 U	81 U	85 U	98 U	75 U	87 U	83 U	63 U	97 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		49 U	41 U	43 U	49 U	38 U	44 U	42 U	32 U	49 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		48 U	39 U	41 U	47 U	36 U	42 U	40 U	31 U	47 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		48 U	40 U	42 U	48 U	37 U	43 U	41 U	31 U	48 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		48 U	40 U	42 U	48 U	37 U	43 U	41 U	31 U	48 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		50 U	41 U	43 U	50 U	38 U	44 U	42 U	32 U	49 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		56 U	46 U	48 U	55 U	42 U	49 U	47 U	36 U	55 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		46 U	37 U	39 U	45 U	35 U	40 U	38 U	29 U	45 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		48 U	40 U	42 U	48 U	37 U	43 U	41 U	31 U	48 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		47 U	39 U	40 U	47 U	36 U	42 U	40 U	30 U	47 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		53 U	44 U	46 U	53 U	40 U	47 U	45 U	34 U	53 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		55 U	45 U	47 U	55 U	42 U	49 U	46 U	35 U	54 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		82 U	67 U	70 U	81 U	62 U	73 U	69 U	53 U	81 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		89 U	73 U	77 U	89 U	68 U	79 U	75 U	58 U	88 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		72 U	59 U	62 U	72 U	55 U	64 U	61 U	46 U	71 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		51 U	42 U	44 U	51 U	39 U	45 U	43 U	33 U	50 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		74 U	61 U	64 U	74 U	57 U	66 U	63 U	48 U	74 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		96 U	79 U	83 U	95 U	73 U	85 U	81 U	62 U	95 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		44 U	36 U	38 U	44 U	34 U	39 U	37 U	28 U	44 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		68 U	56 U	59 U	68 U	52 U	60 U	58 U	44 U	68 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		50 U	41 U	43 U	50 U	38 U	44 U	42 U	32 U	50 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		160 U	130 U	140 U	160 U	120 U	140 U	130 U	100 U	160 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		44 U	36 U	38 U	43 U	33 U	39 U	37 U	28 U	43 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		46 U	38 U	40 U	46 U	35 U	41 U	39 U	30 U	46 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		49 U	40 U	42 U	48 U	37 U	43 U	41 U	31 U	48 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	1,2,3-Trichloropropane (µg/kg) 96-18-4 --	1,2,4-Trichlorobenzene (µg/kg) 120-82-1 18	1,2,4-Trimethylbenzene (µg/kg) 95-63-6 --	1,2-Dibromo-3-chloropropane (µg/kg) 96-12-8 --	1,2-Dichlorobenzene (µg/kg) 95-50-1 23	1,2-Dichloroethane (µg/kg) 107-06-2 --	1,2-Dichloroethene, cis- (µg/kg) 156-59-2 --	1,2-Dichloroethene, trans- (µg/kg) 156-60-5 --	1,2-Dichloropropane (µg/kg) 78-87-5 --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		46 U	38 U	40 U	220 U	37 U	44 U	46 U	39 U	48 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		43 U	35 U	37 U	210 U	35 U	41 U	42 U	36 U	44 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		53 U	44 U	46 U	260 U	43 U	50 U	52 U	45 U	55 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		100 U	86 U	90 U	500 U	84 U	99 U	100 U	88 U	110 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		100 U	84 U	**96 J**	490 U	83 U	97 U	100 U	86 U	110 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		44 U	37 U	38 U	210 U	36 U	42 U	44 U	38 U	46 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		70 U	58 U	60 U	340 U	56 U	66 U	69 U	59 U	72 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		40 U	33 U	34 U	190 U	32 U	37 U	39 U	33 U	41 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		88 U	73 U	76 U	420 U	71 U	83 U	87 U	74 U	91 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		44 U	37 U	38 U	210 U	36 U	42 U	44 U	37 U	46 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		43 U	35 U	37 U	200 U	34 U	40 U	42 U	36 U	44 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		43 U	36 U	37 U	210 U	35 U	41 U	43 U	37 U	45 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		43 U	36 U	37 U	210 U	35 U	41 U	43 U	37 U	45 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		45 U	37 U	39 U	210 U	36 U	42 U	44 U	38 U	46 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		50 U	41 U	43 U	240 U	40 U	47 U	49 U	42 U	52 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		41 U	34 U	35 U	200 U	33 U	39 U	40 U	35 U	42 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		43 U	36 U	37 U	210 U	35 U	41 U	43 U	37 U	45 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		42 U	35 U	36 U	200 U	34 U	40 U	41 U	36 U	44 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		48 U	39 U	41 U	230 U	38 U	45 U	47 U	40 U	49 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		49 U	41 U	42 U	240 U	40 U	47 U	48 U	42 U	51 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		73 U	61 U	63 U	350 U	59 U	69 U	72 U	62 U	76 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		80 U	66 U	69 U	380 U	64 U	76 U	79 U	68 U	83 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		64 U	53 U	56 U	310 U	52 U	61 U	63 U	54 U	67 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		46 U	38 U	39 U	220 U	37 U	43 U	45 U	39 U	47 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		67 U	55 U	58 U	320 U	54 U	63 U	66 U	56 U	69 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		86 U	71 U	74 U	410 U	69 U	81 U	85 U	73 U	89 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		39 U	33 U	34 U	190 U	32 U	37 U	39 U	33 U	41 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		61 U	50 U	53 U	290 U	49 U	58 U	60 U	52 U	63 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		45 U	37 U	39 U	220 U	36 U	43 U	44 U	38 U	46 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		140 U	120 U	120 U	680 U	110 U	130 U	140 U	120 U	150 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		39 U	32 U	34 U	190 U	32 U	37 U	39 U	33 U	40 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		42 U	34 U	36 U	200 U	34 U	39 U	41 U	35 U	43 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		43 U	36 U	38 U	210 U	35 U	41 U	43 U	37 U	45 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	1,3,5-Trimethylbenzene (Mesitylene) (µg/kg)	1,3-Dichlorobenzene (µg/kg)	1,3-Dichloropropane (µg/kg)	1,3-Dichloropropene, cis- (µg/kg)	1,3-Dichloropropene, trans- (µg/kg)	1,4-Dichlorobenzene (µg/kg)	2,2-Dichloropropane (µg/kg)	2-Chlorotoluene (µg/kg)	2-Hexanone (Methyl Butyl Ketone) (µg/kg)
					108-67-8	541-73-1	142-28-9	10061-01-5	10061-02-6	106-46-7	594-20-7	95-49-8	591-78-6
					--	--	--	--	--	90	--	--	--
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		42 U	45 U	40 U	46 U	40 U	41 U	50 U	35 U	170 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		39 U	41 U	38 U	43 U	38 U	38 U	46 U	33 U	160 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		49 U	51 U	46 U	53 U	46 U	47 U	57 U	40 U	200 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		96 U	100 U	91 U	100 U	91 U	92 U	110 U	79 U	390 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		94 U	99 U	89 U	100 U	89 U	90 U	110 U	78 U	390 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		41 U	43 U	39 U	45 U	39 U	39 U	48 U	34 U	170 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		64 U	67 U	61 U	70 U	61 U	61 U	75 U	53 U	260 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		36 U	38 U	35 U	40 U	35 U	35 U	42 U	30 U	150 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		81 U	85 U	77 U	88 U	77 U	77 U	94 U	67 U	330 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		41 U	43 U	39 U	44 U	39 U	39 U	47 U	34 U	170 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		39 U	41 U	37 U	43 U	37 U	37 U	46 U	32 U	160 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		40 U	42 U	38 U	43 U	38 U	38 U	46 U	33 U	160 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		40 U	42 U	38 U	43 U	38 U	38 U	46 U	33 U	160 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		41 U	43 U	39 U	45 U	39 U	39 U	48 U	34 U	170 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		46 U	48 U	44 U	50 U	44 U	44 U	54 U	38 U	190 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		37 U	39 U	36 U	41 U	36 U	36 U	44 U	31 U	150 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		40 U	42 U	38 U	43 U	38 U	38 U	46 U	33 U	160 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		39 U	41 U	37 U	42 U	37 U	37 U	45 U	32 U	160 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		44 U	46 U	42 U	48 U	42 U	42 U	51 U	36 U	180 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		45 U	47 U	43 U	49 U	43 U	43 U	53 U	37 U	190 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		67 U	71 U	64 U	74 U	64 U	64 U	79 U	56 U	280 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		73 U	77 U	70 U	80 U	70 U	70 U	86 U	61 U	300 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		59 U	62 U	56 U	65 U	56 U	57 U	69 U	49 U	240 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		42 U	44 U	40 U	46 U	40 U	40 U	49 U	35 U	170 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		61 U	64 U	58 U	67 U	58 U	59 U	71 U	50 U	250 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		79 U	83 U	75 U	86 U	75 U	75 U	92 U	65 U	320 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		36 U	38 U	34 U	40 U	34 U	35 U	42 U	30 U	150 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		56 U	59 U	53 U	61 U	53 U	54 U	65 U	46 U	230 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		41 U	43 U	39 U	45 U	39 U	40 U	48 U	34 U	170 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		130 U	140 U	120 U	140 U	120 U	120 U	150 U	110 U	530 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		36 U	38 U	34 U	39 U	34 U	34 U	42 U	30 U	150 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		38 U	40 U	36 U	42 U	36 U	37 U	45 U	32 U	160 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		40 U	42 U	38 U	44 U	38 U	38 U	47 U	33 U	160 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	4-Chlorotoluene (µg/kg) 106-43-4 --	4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (µg/kg) 108-10-1 --	Acetone (µg/kg) 67-64-1 --	Benzene (µg/kg) 71-43-2 110	Bromobenzene (µg/kg) 108-86-1 --	Bromochloromethane (µg/kg) 74-97-5 --	Bromodichloromethane (µg/kg) 75-27-4 --	Bromoform (Tribromomethane) (µg/kg) 75-25-2 --	Bromomethane (Methyl Bromide) (µg/kg) 74-83-9 --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		39 U	240 U	190 U	16 U	40 U	48 U	42 U	54 U	89 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		36 U	220 U	180 U	15 U	37 U	44 U	39 U	50 U	83 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		45 U	280 U	220 U	19 U	46 U	55 U	48 U	62 U	100 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		88 U	540 U	440 U	37 U	90 U	110 U	94 U	120 U	200 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		86 U	530 U	**800 J**	36 U	88 U	110 U	92 U	120 U	200 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		38 U	230 U	190 U	16 U	38 U	46 U	40 U	52 U	85 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		59 U	360 U	290 U	25 U	60 U	72 U	63 U	82 U	130 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		33 U	210 U	170 U	14 U	34 U	41 U	36 U	46 U	76 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		74 U	460 U	370 U	31 U	76 U	91 U	79 U	100 U	170 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		37 U	230 U	180 U	16 U	38 U	46 U	40 U	52 U	85 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		36 U	220 U	180 U	15 U	37 U	44 U	38 U	50 U	82 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		37 U	220 U	180 U	15 U	37 U	45 U	39 U	51 U	83 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		37 U	220 U	180 U	15 U	37 U	45 U	39 U	51 U	83 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		38 U	230 U	190 U	16 U	38 U	46 U	40 U	52 U	86 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		42 U	260 U	210 U	18 U	43 U	52 U	45 U	58 U	96 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		35 U	210 U	170 U	14 U	35 U	42 U	37 U	48 U	78 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		37 U	220 U	180 U	15 U	37 U	45 U	39 U	51 U	83 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		36 U	220 U	180 U	15 U	36 U	44 U	38 U	49 U	81 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		40 U	250 U	200 U	17 U	41 U	49 U	43 U	56 U	91 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		42 U	260 U	210 U	17 U	42 U	51 U	44 U	57 U	94 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		62 U	380 U	310 U	26 U	63 U	76 U	66 U	86 U	140 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		68 U	420 U	330 U	28 U	69 U	83 U	72 U	93 U	150 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		54 U	330 U	270 U	23 U	55 U	67 U	58 U	75 U	120 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		39 U	240 U	190 U	16 U	39 U	47 U	41 U	53 U	88 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		56 U	350 U	280 U	23 U	57 U	69 U	60 U	78 U	130 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		73 U	450 U	360 U	30 U	74 U	89 U	77 U	100 U	170 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		33 U	200 U	160 U	14 U	34 U	41 U	35 U	46 U	76 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		52 U	320 U	260 U	22 U	52 U	63 U	55 U	71 U	120 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		38 U	230 U	190 U	16 U	39 U	46 U	40 U	53 U	86 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		120 U	740 U	590 U	50 U	120 U	150 U	130 U	170 U	270 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		33 U	200 U	160 U	14 U	34 U	40 U	35 U	46 U	75 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		35 U	220 U	170 U	15 U	36 U	43 U	37 U	49 U	80 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		37 U	230 U	180 U	15 U	37 U	45 U	39 U	51 U	84 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	Carbon Disulfide (µg/kg) 75-15-0 --	Carbon Tetrachloride (Tetrachloromethane) (µg/kg) 56-23-5 --	Chlorobenzene (µg/kg) 108-90-7 --	Chloroethane (µg/kg) 75-00-3 --	Chloroform (µg/kg) 67-66-3 --	Chloromethane (µg/kg) 74-87-3 --	Cyclohexane (µg/kg) 110-82-7 --	Cymene, p- (4-Isopropyltoluene) (µg/kg) 99-87-6 --	Dibromochloromethane (µg/kg) 124-48-1 --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		89 UJ	43 U	43 U	56 U	41 U	36 U	54 U	40 U	54 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		83 U	40 U	40 U	52 U	38 U	33 U	50 U	38 U	51 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		100 U	49 U	50 U	65 U	48 U	41 U	62 U	46 U	63 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		200 U	97 U	97 U	130 UJ	93 U	81 U	120 U	91 U	120 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		200 U	95 U	95 U	120 UJ	91 U	79 U	120 U	89 U	120 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		86 U	41 U	41 U	54 UJ	40 U	34 U	52 U	39 U	52 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		140 U	65 U	65 U	85 UJ	62 U	54 U	82 U	61 U	82 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		77 U	37 U	37 U	48 UJ	35 U	31 U	46 U	35 U	47 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		170 U	82 U	82 U	110 UJ	79 U	68 U	100 U	77 U	100 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		86 U	41 U	41 U	54 UJ	40 U	34 U	52 U	39 U	52 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		83 U	40 U	40 U	52 UJ	38 U	33 U	50 U	37 U	50 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		84 U	40 U	40 U	53 UJ	39 U	33 U	51 U	38 U	51 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		84 U	40 U	40 U	53 U	39 U	33 U	51 U	38 U	51 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		86 U	41 U	42 U	54 UJ	40 U	34 U	52 U	39 U	53 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		97 U	46 U	47 U	61 UJ	45 U	39 U	58 U	44 U	59 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		79 U	38 U	38 U	50 UJ	36 U	32 U	48 U	36 U	48 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		84 U	40 U	40 U	53 UJ	39 U	33 U	51 U	38 U	51 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		82 U	39 U	39 U	51 UJ	38 U	33 U	49 U	37 U	50 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		92 U	44 U	44 U	58 UJ	42 U	37 U	56 U	42 U	56 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		95 U	46 U	46 U	60 UJ	44 U	38 U	57 U	43 U	58 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		140 U	68 U	68 U	89 U	65 U	57 U	86 U	64 U	86 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		150 U	74 U	75 U	97 UJ	71 U	62 U	93 U	70 U	94 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		120 U	60 U	60 U	78 U	58 U	50 U	75 U	56 U	76 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		88 U	42 U	43 U	56 U	41 U	35 U	53 U	40 U	54 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		130 U	62 U	62 U	81 U	59 U	51 U	78 U	58 U	78 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		170 U	80 U	80 U	100 U	77 U	66 U	100 U	75 U	100 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		76 U	37 U	37 U	48 U	35 U	30 U	46 U	34 U	46 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		120 U	57 U	57 U	74 U	55 U	47 U	71 U	53 U	72 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		87 U	42 U	42 U	55 U	40 U	35 U	53 U	39 U	53 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		270 U	130 U	130 U	170 U	130 U	110 U	170 U	120 U	170 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		76 U	36 U	36 U	48 U	35 U	30 U	46 U	34 U	46 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		80 U	39 U	39 U	51 U	37 U	32 U	49 U	36 U	49 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		84 U	40 U	41 U	53 U	39 U	34 U	51 U	38 U	51 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	Dibromomethane (µg/kg) 74-95-3 --	Dichlorodifluoromethane (µg/kg) 75-71-8 --	Dichloromethane (Methylene Chloride) (µg/kg) 75-09-2 --	Diisopropylether (Isopropyl Ether) (µg/kg) 108-20-3 --	Ethylbenzene (µg/kg) 100-41-4 --	Ethylene dibromide (1,2-Dibromoethane) (µg/kg) 106-93-4 --	Hexachlorobutadiene (Hexachloro-1,3-butadiene) (µg/kg) 87-68-3 --	Isopropylbenzene (Cumene) (µg/kg) 98-82-8 --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		30 U	75 U	210 U	31 U	20 U	43 U	50 U	43 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		28 U	70 U	180 U	29 U	19 U	40 U	46 U	40 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		35 U	87 U	230 U	35 U	23 U	50 U	57 U	49 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		68 U	170 U	410 U	70 U	46 U	97 U	110 U	97 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		67 U	170 U	400 U	68 U	45 U	95 U	110 U	95 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		29 U	72 U	170 U	30 U	20 U	41 U	48 U	41 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		46 U	110 U	270 U	47 U	31 U	65 U	75 U	65 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		26 U	64 U	160 U	26 U	17 U	37 U	43 U	37 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		57 U	140 U	350 U	59 U	39 U	82 U	95 U	82 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		29 U	72 U	170 U	29 U	20 U	41 U	48 U	41 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		28 U	69 U	170 U	28 U	19 U	40 U	46 U	40 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		28 U	70 U	170 U	29 U	19 U	40 U	47 U	40 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		28 U	70 U	170 U	29 U	19 U	40 U	47 U	40 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		29 U	73 U	180 U	30 U	20 U	42 U	48 U	41 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		33 U	81 U	200 U	33 U	22 U	47 U	54 U	46 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		27 U	66 U	160 U	27 U	18 U	38 U	44 U	38 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		28 U	70 U	170 U	29 U	19 U	40 U	47 U	40 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		27 U	69 U	170 U	28 U	19 U	39 U	45 U	39 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		31 U	77 U	190 U	32 U	21 U	44 U	51 U	44 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		32 U	80 U	190 U	33 U	22 U	46 U	53 U	46 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		48 U	120 U	290 U	49 U	32 U	68 U	79 U	68 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		52 U	130 U	310 U	53 U	35 U	75 U	86 U	74 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		42 U	100 U	250 U	43 U	28 U	60 U	69 U	60 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		30 U	74 U	180 U	30 U	20 U	43 U	49 U	42 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		43 U	110 U	260 U	44 U	29 U	62 U	72 U	62 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		56 U	140 U	340 U	57 U	38 U	80 U	92 U	80 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		26 U	64 U	160 U	26 U	17 U	37 U	42 U	37 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		40 U	99 U	290 U	41 U	27 U	57 U	66 U	57 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		29 U	73 U	210 U	30 U	20 U	42 U	48 U	42 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		92 U	230 U	630 U	94 U	63 U	130 U	150 U	130 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		25 U	64 U	180 U	26 U	17 U	36 U	42 U	36 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		27 U	68 U	180 U	28 U	18 U	39 U	45 U	39 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		28 U	71 U	190 U	29 U	19 U	41 U	47 U	40 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	Methyl Acetate (µg/kg) 79-20-9 --	Methyl Ethyl Ketone (2-Butanone) (µg/kg) 78-93-3 --	Methyl Tert-Butyl Ether (MTBE) (µg/kg) 1634-04-4 --	Methylcyclohexane (µg/kg) 108-87-2 --	Naphthalene (µg/kg) 91-20-3 561	n-Butylbenzene (µg/kg) 104-51-8 --	n-Propylbenzene (µg/kg) 103-65-1 --	sec-Butylbenzene (µg/kg) 135-98-8 --	Styrene (µg/kg) 100-42-5 --	tert-Butylbenzene (µg/kg) 98-06-6 --
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		230 U	**930**	44 U	35 U	**66 J**	43 U	46 U	44 U	43 U	44 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		210 U	**830**	41 U	33 U	35 U	40 U	43 U	41 U	40 U	41 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		**260 J**	**920**	51 U	41 U	43 U	50 U	53 U	51 U	50 U	51 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		510 U	530 U	99 U	80 U	84 U	98 U	100 U	100 U	97 U	100 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		**970 J**	**1,200**	97 U	79 U	**180 J**	96 U	100 U	98 U	95 U	98 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		220 U	**700**	42 U	34 U	36 U	42 U	44 U	43 U	41 U	43 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		**470 J**	**1,100**	66 U	54 U	56 U	65 U	70 U	67 U	65 U	67 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		190 U	200 U	38 U	30 U	32 U	37 U	40 U	38 U	37 U	38 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		430 U	**1,200**	84 U	68 U	71 U	83 U	88 U	85 U	82 U	85 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		220 U	**730**	42 U	34 U	36 U	41 U	44 U	43 U	41 U	43 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		210 U	220 U	41 U	33 U	34 U	40 U	43 U	41 U	40 U	41 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		210 U	**710**	41 U	33 U	35 U	41 U	43 U	42 U	40 U	42 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		210 U	220 U	41 U	33 U	35 U	41 U	43 U	42 U	40 U	42 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		220 U	**770**	42 U	34 U	36 U	42 U	45 U	43 U	42 U	43 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		240 U	**790**	47 U	38 U	40 U	47 U	50 U	48 U	47 U	48 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		200 U	**640**	39 U	31 U	33 U	38 U	41 U	39 U	38 U	39 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		210 U	**720**	41 U	33 U	35 U	41 U	43 U	42 U	40 U	42 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		210 U	220 U	40 U	32 U	34 U	39 U	42 U	40 U	39 U	40 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		230 U	**730**	45 U	36 U	38 U	45 U	48 U	46 U	44 U	46 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		240 U	**690**	47 U	38 U	**80 J**	46 U	49 U	47 U	46 U	47 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		360 U	**570 J**	70 U	56 U	**63 J**	69 U	73 U	70 U	68 U	70 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		**600 J**	410 U	76 U	61 U	**73 J**	75 U	80 U	77 U	75 U	77 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		310 U	330 U	61 U	49 U	**96 J**	60 U	64 U	62 U	60 U	62 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		220 U	230 U	43 U	35 U	**38 J**	43 U	46 U	44 U	43 U	44 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		320 U	**700 J**	63 U	51 U	54 U	62 U	67 U	64 U	62 U	64 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		420 U	**900 J**	82 U	66 U	69 U	80 U	86 U	83 U	80 U	83 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		190 U	200 U	38 U	30 U	32 U	37 U	39 U	38 U	37 U	38 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		**300 J**	**1,200**	58 U	47 U	**160**	57 U	61 U	59 U	57 U	59 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		220 U	**990**	43 U	35 U	36 U	42 U	45 U	43 U	42 U	43 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		**960 J**	**2,300**	130 U	110 U	110 U	130 U	140 U	140 U	130 U	140 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		190 U	**710**	37 U	30 U	32 U	37 U	39 U	38 U	36 U	38 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		200 U	**820**	40 U	32 U	34 U	39 U	42 U	40 U	39 U	40 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		210 U	**760**	41 U	33 U	35 U	41 U	43 U	42 U	41 U	42 U

Table 5-5
Analytical Results for VOCs

Location ID	Sample ID	Date	Depth Interval (ft bss)	CAS No. PEC	Tetrachloroethene (PCE) (µg/kg)	Toluene (µg/kg)	Total Xylene (reported, not calculated) (µg/kg)	Trichloroethene (TCE) (µg/kg)	Trichlorofluoromethane (Fluorotrichloromethane) (µg/kg)	Vinyl Chloride (µg/kg)
					127-18-4	108-88-3	1330-20-7	79-01-6	75-69-4	75-01-4
					--	1800	50	--	--	--
MKE-20-080-C	MKE-20-080-C-00-01-200923	9/23/2020	0 - 1		41 U	**82**	25 U	18 U	48 U	29 U
MKE-20-080-C	MKE-20-080-C-01-02-200923	9/23/2020	1 - 2		38 U	**38**	23 U	17 U	44 U	27 U
MKE-20-081-C	MKE-20-081-C-00-1.1-200923	9/23/2020	0 - 1.1		48 U	**25 J**	28 U	21 U	55 U	34 U
MKE-20-084-C	MKE-20-084-C-00-01-200901	9/1/2020	0 - 1		93 U	37 U	55 U	41 U	110 U	66 U
MKE-20-084-C	MKE-20-084-C-01-2.6-200901	9/1/2020	1 - 2.6		91 U	**260**	**90J**	41 U	110 U	65 U
MKE-20-084-C	*MKE-20-084-C-2.6-4.7-200901*	9/1/2020	2.6 - 4.7		40 U	16 U	24 U	18 U	46 U	28 U
MKE-20-085-C	MKE-20-085-C-00-1.2-200901	9/1/2020	0 - 1.2		62 U	**31 J**	37 U	28 U	72 U	44 U
MKE-20-085-C	MKE-20-085-C-1.2-2.5-200901	9/1/2020	1.2 - 2.5		35 U	14 U	21 U	16 U	41 U	25 U
MKE-20-086-C	MKE-20-086-C-00-01-200902	9/2/2020	0 - 1		79 U	31 U	47 U	35 U	91 U	56 U
MKE-20-086-C	MKE-20-086-C-01-2.7-200902	9/2/2020	1 - 2.7		40 U	16 U	24 U	18 U	46 U	28 U
MKE-20-087-C	MKE-20-087-C-00-1.4-200902	9/2/2020	0 - 1.4		38 U	**22 J**	23 U	17 U	44 U	27 U
MKE-20-087-C	MKE-20-087-C-1.4-03-200902	9/2/2020	1.4 - 3		39 U	15 U	23 U	17 U	45 U	27 U
MKE-20-087-C	*MKE-20-087-C-03-4.3-200902*	9/2/2020	3 - 4.3		39 U	15 U	23 U	17 U	45 U	27 U
MKE-20-088-C	MKE-20-088-C-00-01-200902	9/2/2020	0 - 1		40 U	16 U	24 U	18 U	46 U	28 U
MKE-20-088-C	MKE-20-088-C-01-03-200902	9/2/2020	1 - 3		45 U	18 U	27 U	20 U	52 U	32 U
MKE-20-088-C	MKE-20-088-C-03-4.1-200902	9/2/2020	3 - 4.1		36 U	14 U	22 U	16 U	42 U	26 U
MKE-20-089-C	*MKE-20-089-C-00-01-200902*	9/2/2020	0 - 1		39 U	15 U	23 U	17 U	45 U	27 U
MKE-20-089-FR	*MKE-20-089-FR-00-01-200902*	9/2/2020	0 - 1		38 U	15 U	22 U	17 U	44 U	27 U
MKE-20-089-C	*MKE-20-089-C-01-1.7-200902*	9/2/2020	1 - 1.7		42 U	17 U	25 U	19 U	49 U	30 U
MKE-20-090-C	MKE-20-090-C-00-01-200902	9/2/2020	0 - 1		44 U	**130**	26 U	19 U	51 U	31 U
MKE-20-090-C	MKE-20-090-C-01-03-200902	9/2/2020	1 - 3		65 U	**200**	39 U	29 U	76 U	46 U
MKE-20-090-C	FD-202009021545	9/2/2020	1 - 3		71 U	**220**	42 U	32 U	83 U	51 U
MKE-20-090-C	MKE-20-090-C-03-4.7-200902	9/2/2020	3 - 4.7		58 U	**340**	34 U	26 U	67 U	41 U
MKE-20-090-C	MKE-20-090-C-4.7-5.7-200902	9/2/2020	4.7 - 5.7		41 U	16 U	24 U	18 U	47 U	29 U
MKE-20-091-C	MKE-20-091-C-00-01-200903	9/3/2020	0 - 1		59 U	24 U	35 U	26 U	69 U	42 U
MKE-20-091-C	MKE-20-091-C-01-3.1-200903	9/3/2020	1 - 3.1		77 U	**120**	46 U	34 U	89 U	54 U
MKE-20-091-C	*MKE-20-091-C-3.1-4.3-200903*	9/3/2020	3.1 - 4.3		35 U	14 U	21 U	16 U	41 U	25 U
MKE-20-092-C	MKE-20-092-C-00-1.2-200923	9/23/2020	0 - 1.2		55 U	**260**	32 U	24 U	63 U	39 U
MKE-20-092-C	*MKE-20-092-C-1.2-1.9-200923*	9/23/2020	1.2 - 1.9		40 U	16 U	24 U	18 U	46 U	28 U
MKE-20-094-C	MKE-20-094-C-00-01-200923	9/23/2020	0 - 1		130 U	**69 J**	75 U	56 U	150 U	90 U
MKE-20-094-C	MKE-20-094-C-01-1.8-200923	9/23/2020	1 - 1.8		35 U	14 U	21 U	15 U	40 U	25 U
MKE-20-094-C	FD-202009231020	9/23/2020	1 - 1.8		37 U	15 U	22 U	16 U	43 U	26 U
MKE-20-095-C	*MKE-20-095-C-00-1.2-200923*	9/23/2020	0 - 1.2		39 U	15 U	23 U	17 U	45 U	28 U

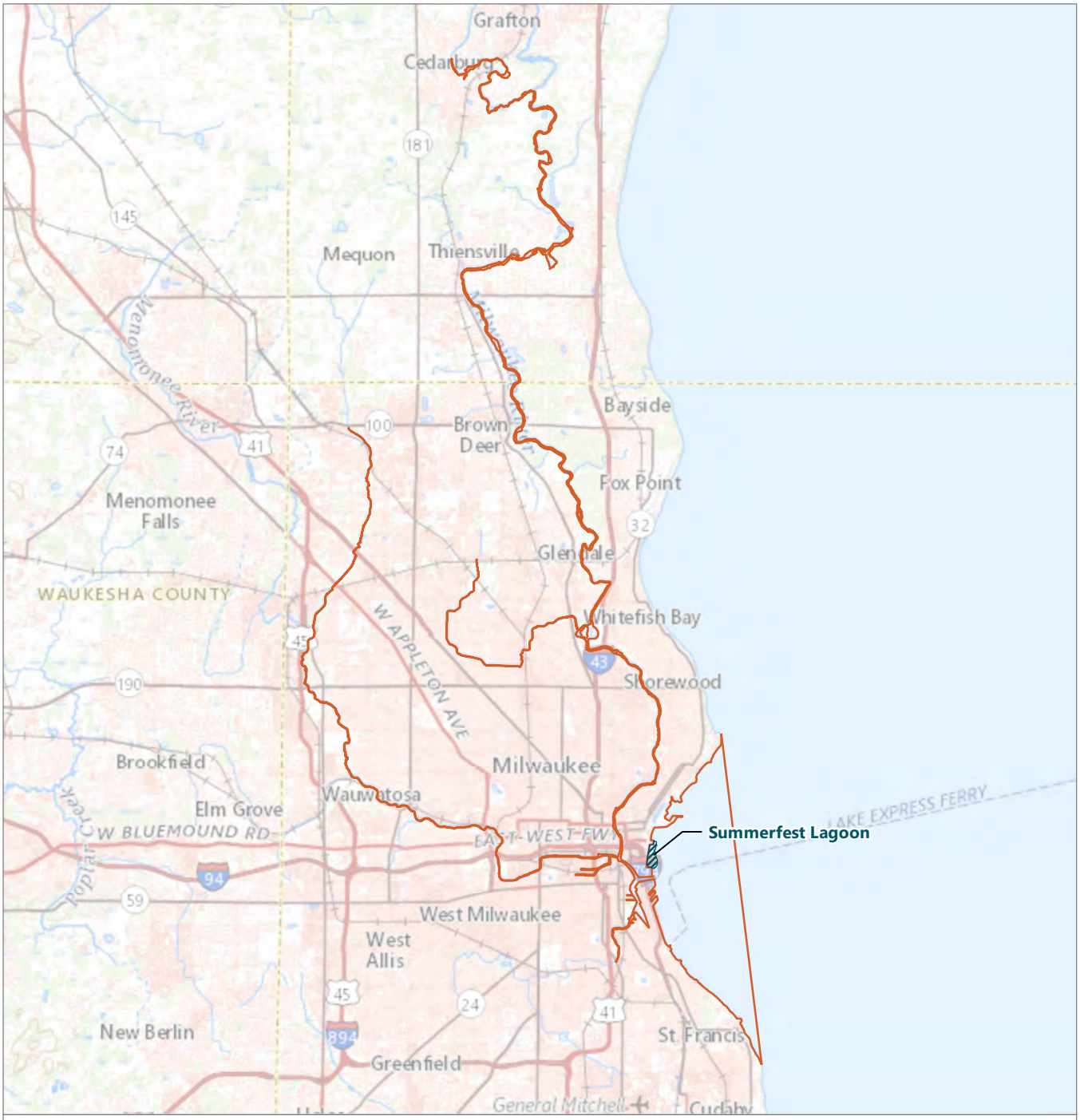
Table 5-5
Analytical Results for VOCs

Notes:
1. Validated results were screened against the PEC, 3xPEC, and 5xPEC. PEC were provided in DNR 2003
2. DNR (Wisconsin Department of Natural Resources), 2003. *Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application*. Publication No. WT-732.
3. Sample intervals defined as native materials based on visual observations are shown in italics

Screening Criteria:
Detected concentration is greater than PEC screening level
Detected concentration is greater than 3xPEC screening level
Detected concentration is greater than 5xPEC screening level
Bold: detected result

Abbreviations:
µg/kg: micrograms per kilogram
CAS: Chemical Abstracts System
DNR: Wisconsin Department of Natural Resources
FD: field duplicate sample
FR: field replicate sample
ft bss: feet below sediment surface
J: indicates an estimated value
PEC: probable effects concentration
U: indicates the compound analyzed for but not detected above detection limit
UJ: indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimatec
VOC: volatile organic compound

Figures



LEGEND:

- Milwaukee Estuary AOC
- Summerfest Lagoon

NOTES:

1. Basemap: Esri, USGS The National Map
2. Horizontal datum: Wisconson State Plane, South Zone, North American Datum of 1983 (NAD83), U.S. Feet

0 2
Miles

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Figure 1-1
Site Location Map

Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Source: USACE Milwaukee Harbor Project Map, June 1939 Edition.

Figure 2-1a
Shoreline Features – 1939

Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Source: USACE Milwaukee Harbor Project Map, June 1957 Edition.

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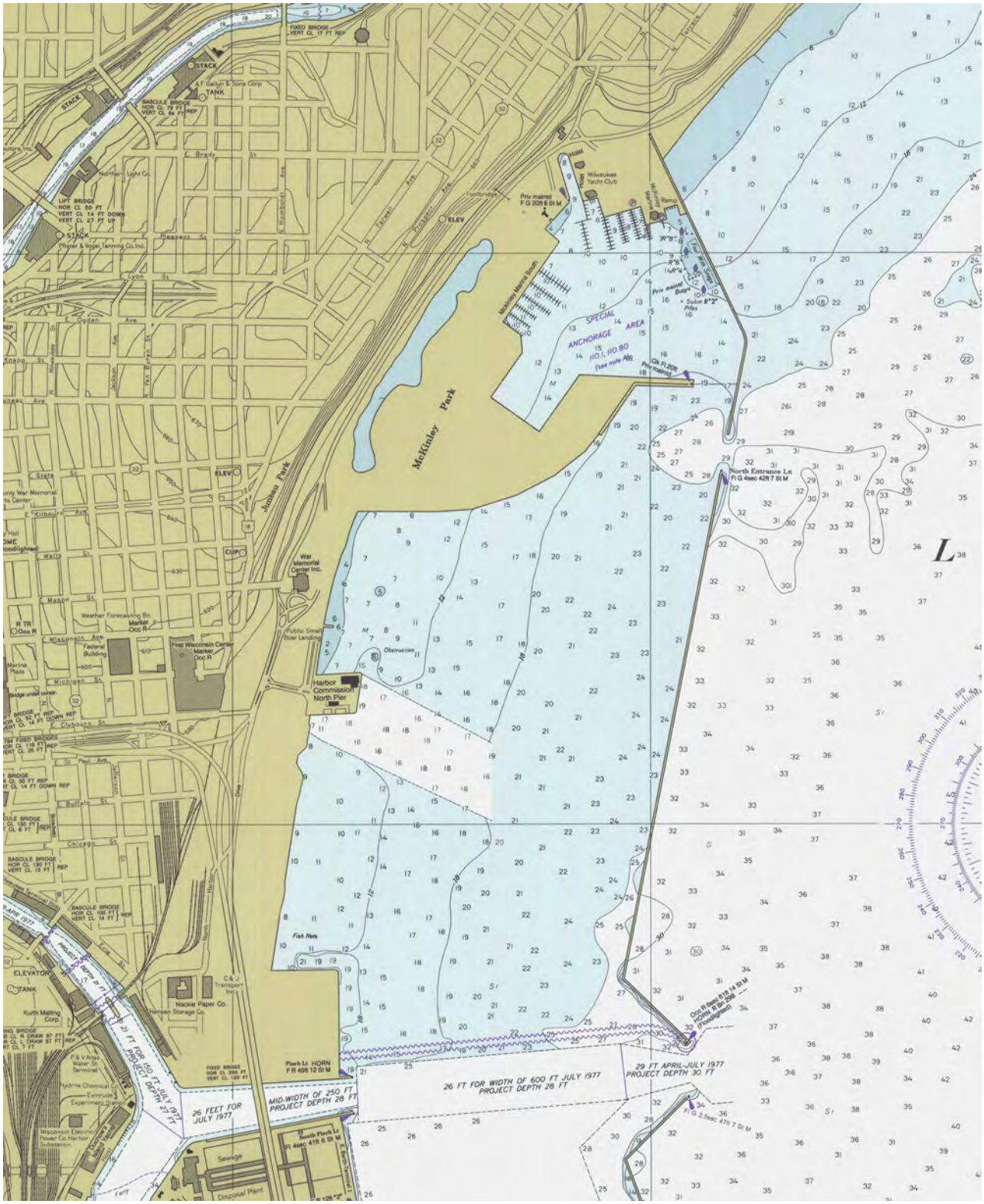
Figure 2-1b
Shoreline Features – 1957
Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



Source: National Oceanic and Atmospheric Administration, Chart 14924, July 1978.

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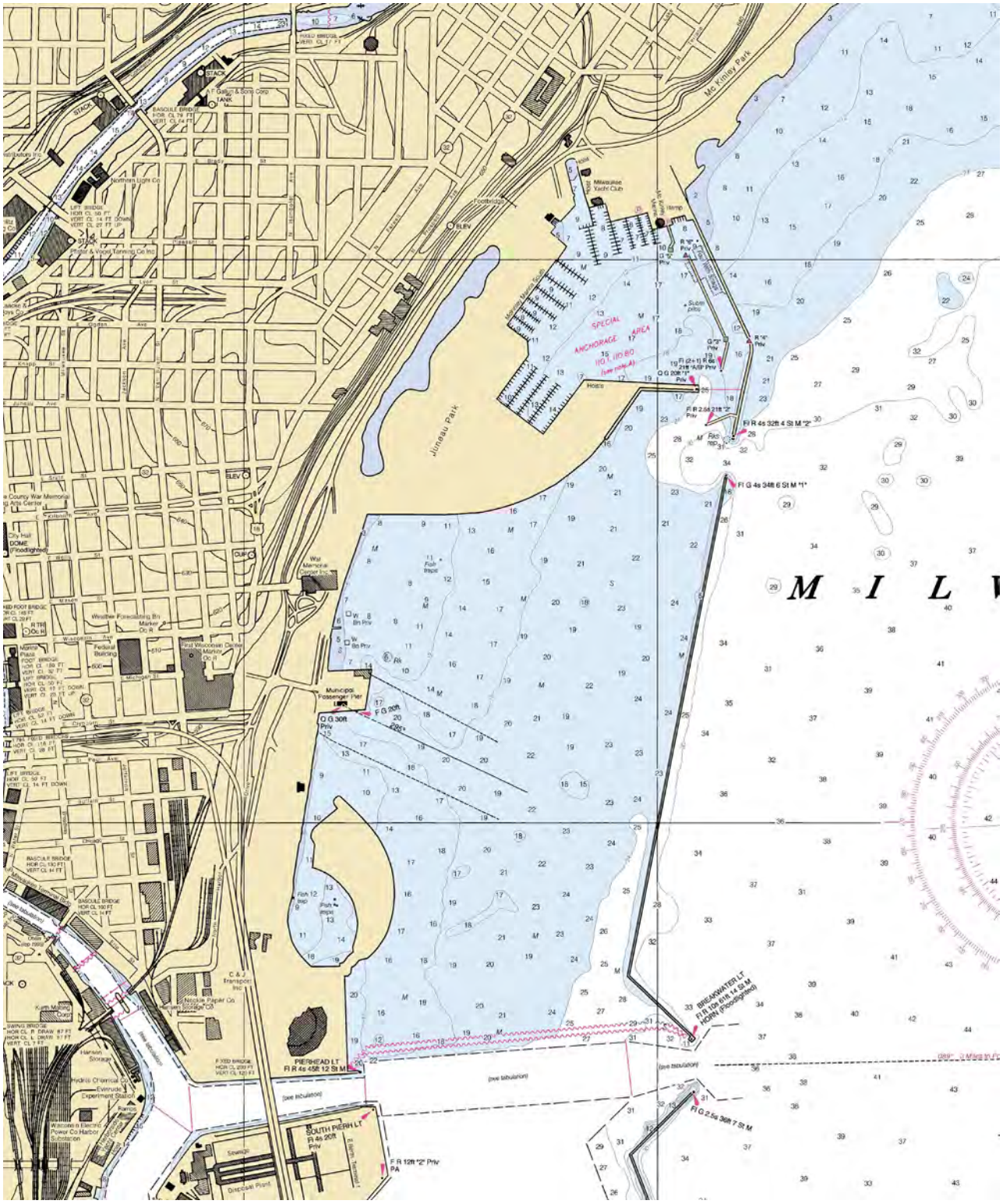
Figure 2-1c
Shoreline Features – 1978

Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



Source: National Oceanic and Atmospheric Administration, Chart 14924, April 2002.

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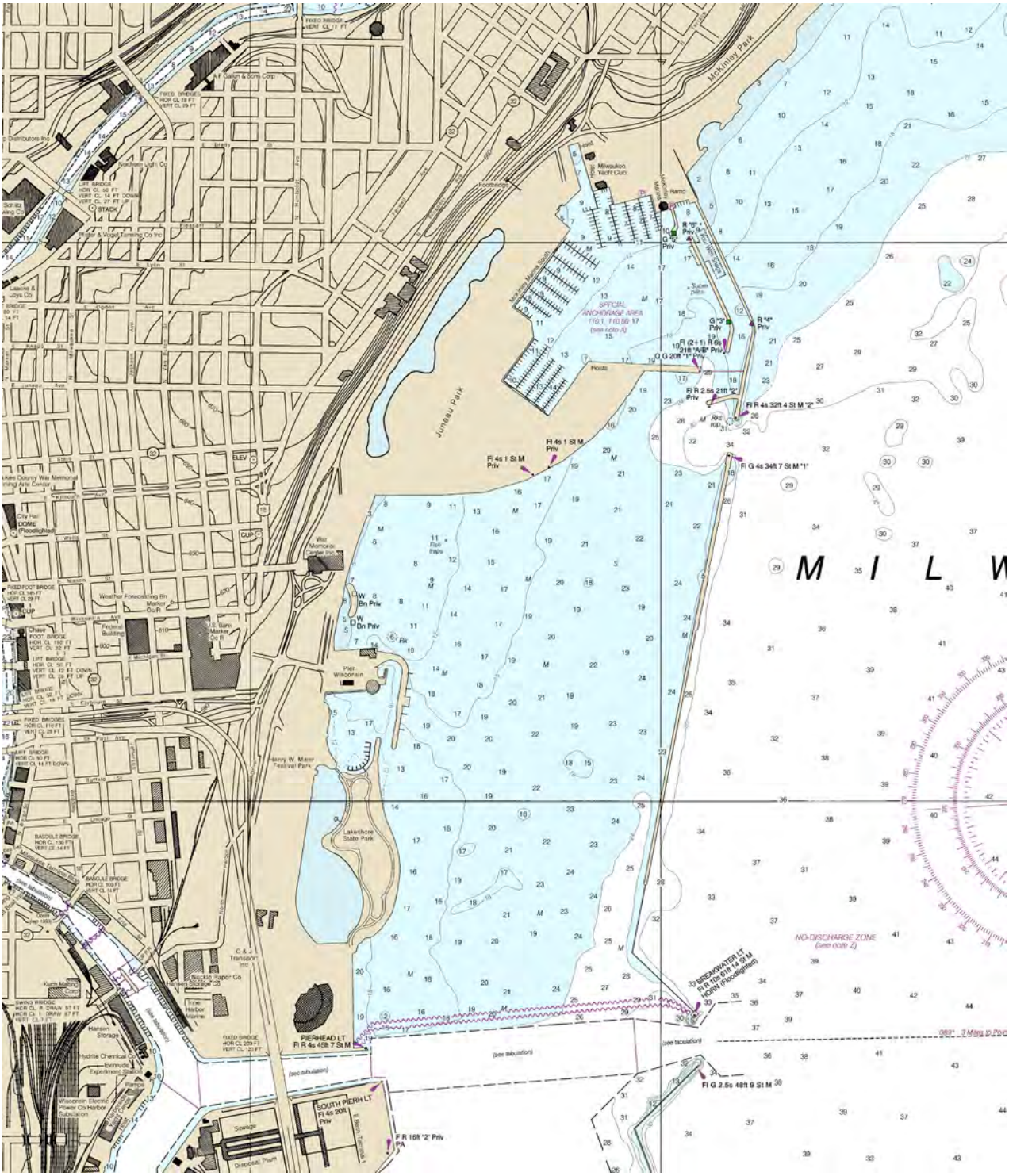
Figure 2-1d
Shoreline Features – 2002

Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin



Source: National Oceanic and Atmospheric Administration, Chart 14924, December 2012.

ANCHOR QEA

Figure 2-1e
Shoreline Features – 2012

Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

LEGEND:

- Milwaukee Estuary AOC
- 2020 Sediment Location (n= 13)
- Discovery World

Habitat Features

- Gravel Bed Habitat Plan
- North Woody Habitat Area Plan
- South Woody Habitat Area Plan
- Spawning Bed Habitat Plan

NOTE:
1) Horizontal datum: Wisconson State Plane, South Zone, North American Datum of 1983 (NAD83), U.S. Feet

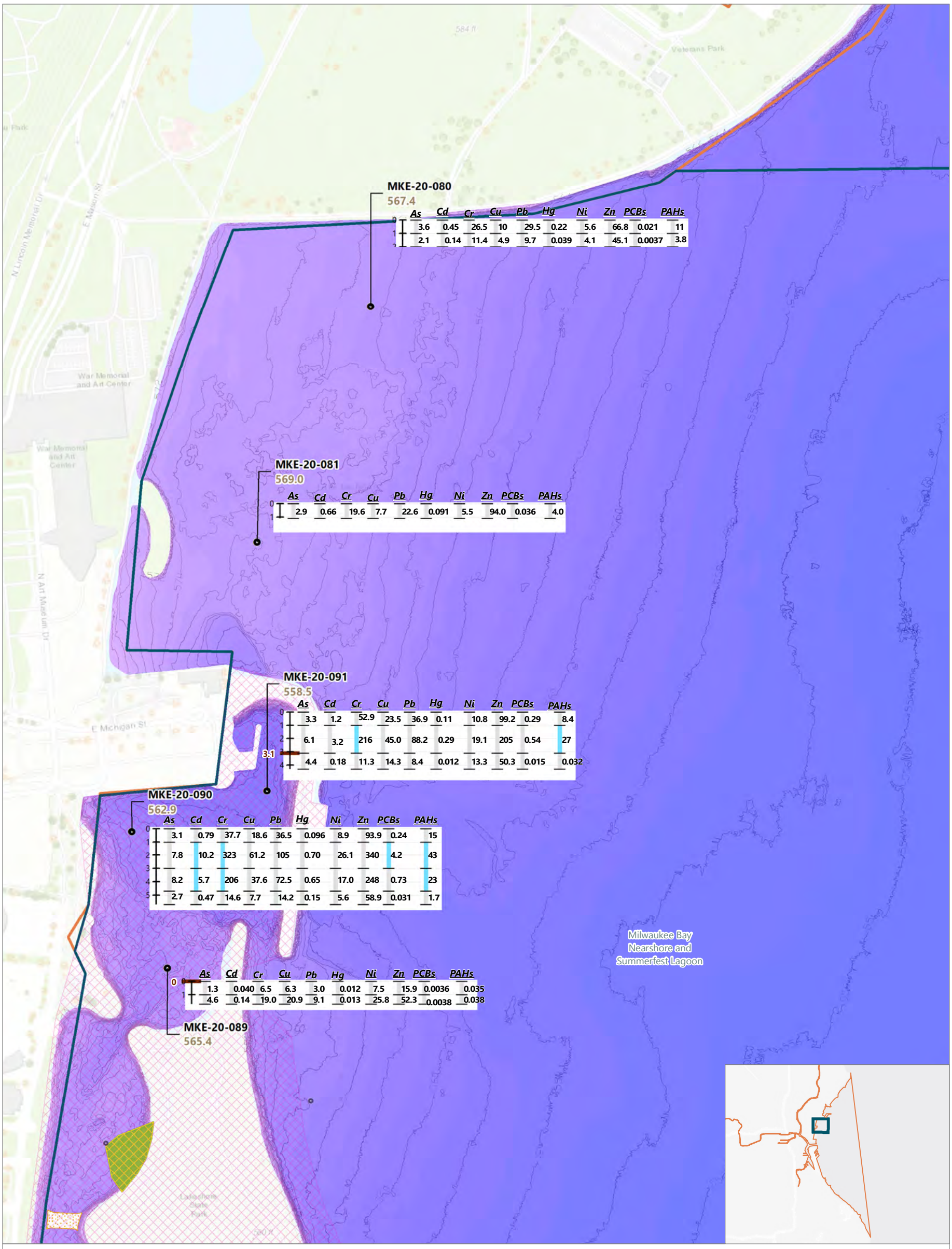
0 1,000
Feet

Publish Date: 2021/03/05, 5:07 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\WisconsinDNR_1779\Maps\Figures\SummefestLagoon\AQ_Figure03_01_SummerfestLagoon_Sampling2020.mxd

ANCHOR QEA

Figure 3-1
Sampling Locations - Summerfest Lagoon Area
Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

DRAFT



LEGEND:

- Milwaukee Estuary AOC
- Milwaukee Bay Nearshore and Summerfest Lagoon
- Bathymetric Contour
- Summerfest Lagoon
- Sediment Locations (n =5)
- Native Material Encountered

Habitat Features

- Gravel Bed Habitat Plan
- North Woody Habitat Area Plan

SAMPLE ID
Mudline Elevation
Depth (ft.)
0
1
2
3
4
5

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

Bathymetric Scale (Feet)
High : 585
Low : 525

NOTES:
1) Horizontal datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S. Feet
2) Vertical datum: International Great Lakes Datum of 1985 (IGLD85), U.S. Feet
3) Core counts only include cores within Summerfest Lagoon - North.
4) PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication No. WT-732 2003 (Wisconsin Department of Natural Resources, 2003).

AOC: Area of Concern
PEC: Probable Effects Concentration
mg/kg: milligrams per kilogram

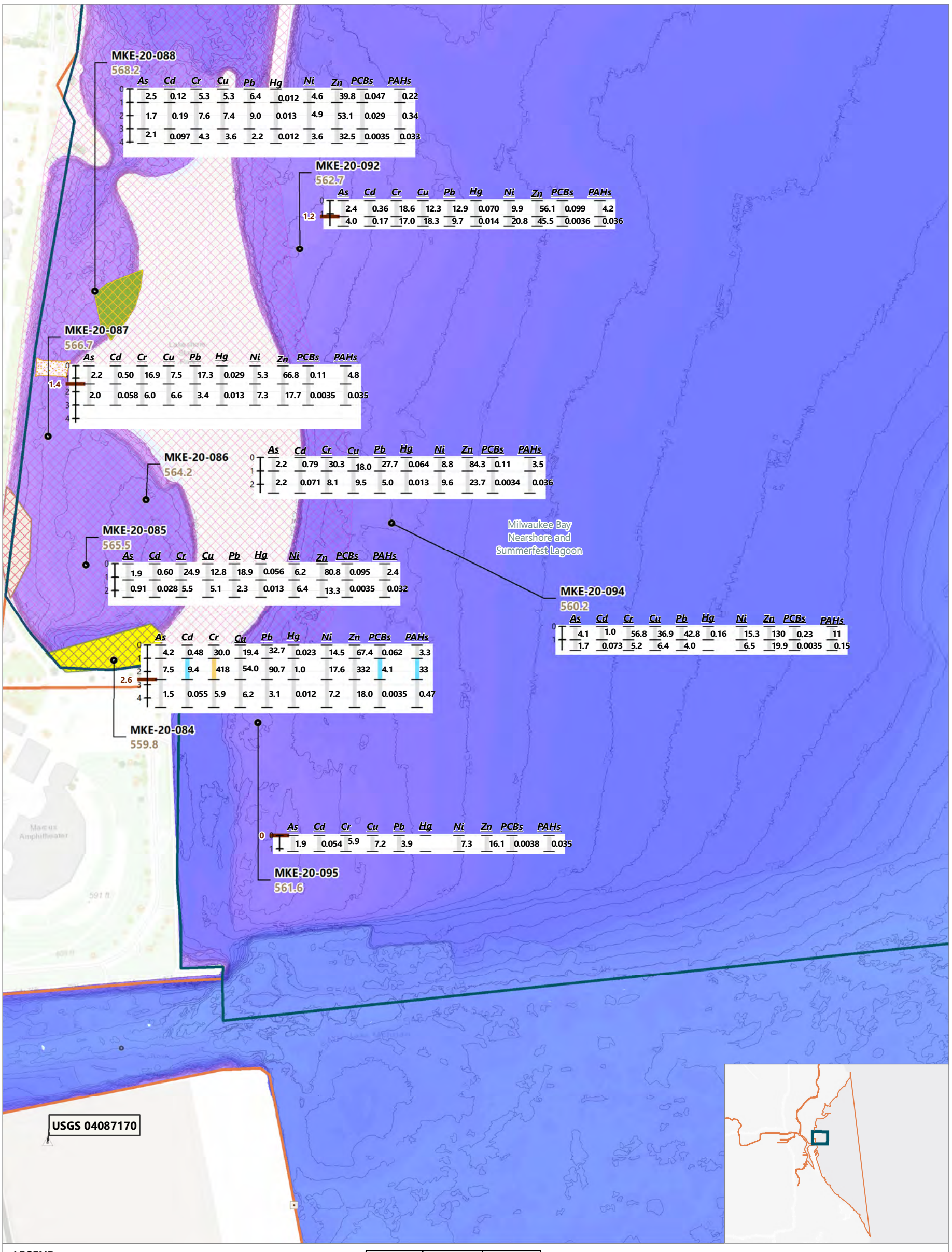
0 400
Feet

Publish Date: 2021/03/22, 2:19 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\WisconsinDNR_1779\Maps\Figures\SummefestLagoon\AQ_Figure05x_SummerfestLagoon_SedimentChemistry_Validated_.mxd

ANCHOR QEA

Figure 5-1
Results of Sediment Chemical Analysis in Summerfest Lagoon - North
Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

DRAFT



LEGEND:

- Milwaukee Estuary AOC
- Milwaukee Bay Nearshore and Summerfest Lagoon
- Bathymetric Contour
- Unspecified Outfall Location
- Gauge Station
- Summerfest Lagoon
- Sediment Locations (n =8)
- Native Material Encountered

Habitat Features

- Gravel Bed Habitat Plan
- North Woody Habitat Area Plan
- South Woody Habitat Area Plan
- Spawning Bed Habitat Plan

SAMPLE ID
Mudline Elevation
Depth (ft.)
0
1
2
3
4
5

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

Bathymetric Scale (Feet)
High : 585
Low : 525

NOTES:
1) Horizontal datum: Wisconsin State Plane, South Zone, North American Datum of 1983 (NAD83), U.S. Feet
2) Vertical datum: International Great Lakes Datum of 1985 (IGLD85), U.S. Feet
3) Core counts only include cores within Summerfest Lagoon - South.
4) PEC values were obtained from the Consensus-Based Sediment Quality Guidelines, Recommendations for Use & Application. Publication No. WT-732 2003 (Wisconsin Department of Natural Resources, 2003).
5) Blank intervals reflected in sediment samples MKE-20-094 (01-1.8 feet) and MKE-20-095 (00-1.2 feet) were rejected due to no or very low recoveries in the associated matrix spike and matrix spike duplicate.

AOC: Area of Concern
PEC: Probable Effects Concentration
mg/kg: milligrams per kilogram

0 400
Feet

Publish Date: 2021/03/22, 2:21 PM | User: jquinley
Filepath: \\orcas\GIS\Jobs\WisconsinDNR_1779\Maps\Figures\SummefestLagoon\AQ_Figure05x_SummerfestLagoon_SedimentChemistry_Validated_.mxd

ANCHOR QEA

Figure 5-2
Results of Sediment Chemical Analysis in Summerfest Lagoon - South
Characterization of Sediments in Kinnickinnic River and Milwaukee Bay of the Milwaukee Estuary Area of Concern
Milwaukee, Wisconsin

Appendix A
Photograph Logs

Photograph 1
MKE-20-080 (0.0–2.0 feet, intact core)

Photograph 2
MKE-20-080 (0.0–2.0 feet, split core)

Photograph 1
MKE-20-081 (0.0–1.1 feet, intact core)

Photograph 2
MKE-20-081 (0.0–1.1 feet, split core)

Photograph 1
MKE-20-084 (0.0–4.7 feet, intact core)

Photograph 2
MKE-20-084 (0.0–4.7 feet, split core)

Photograph 1
MKE-20-085 (0.0–2.5 feet, intact core)

Photograph 2
MKE-20-085 (0.0–2.5 feet, split core)

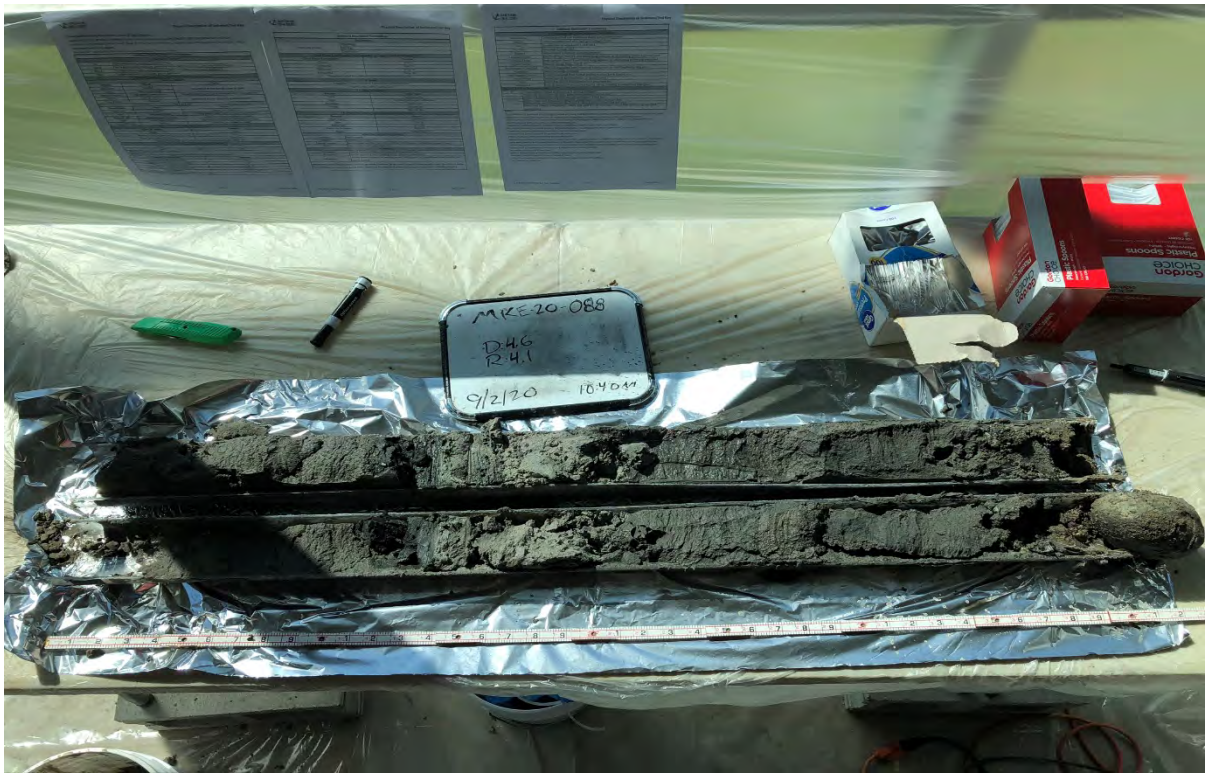
Photograph 1
MKE-20-086 (0.0–2.7 feet, intact core)

Photograph 2
MKE-20-086 (0.0–2.7 feet, split core)

Photograph 1
MKE-20-087 (0.0–4.3 feet, intact core)

Photograph 2
MKE-20-087 (0.0–4.3 feet, split core)

Photograph 1
MKE-20-088 (0.0–4.1 feet, split core)



Photograph 1

MKE-20-088-G (0.0–3.0 feet, intact core)

Photograph 2

MKE-20-088-G (0.0–3.0 feet, split core)

Photograph 1
MKE-20-089 (0.0–1.7 feet, intact core)

Photograph 2
MKE-20-089 (0.0–1.7 feet, split core)

Photograph 1
MKE-20-090 (0.0–5.7 feet, intact core)

Photograph 2
MKE-20-090 (0.0–3.5 feet, intact core)

Photograph 3
MKE-20-090 (2.2–5.7 feet, intact core)

Photograph 4
MKE-20-090 (0.0–5.7 feet, split core)

Photograph 5
MKE-20-090 (0.0–2.8 feet, split core)

Photograph 6
MKE-20-090 (2.4–5.7 feet, split core)

Photograph 1
MKE-20-091 (0.0–4.3 feet, intact core)

Photograph 2
MKE-20-091 (0.0–4.3 feet, split core)

Photograph 1
MKE-20-092 (0.0–1.9 feet, intact core)

Photograph 2
MKE-20-092 (0.0–1.9 feet, split core)

Photograph 1
MKE-20-094 (0.0–1.8 feet, intact core)

Photograph 2
MKE-20-094 (0.0–1.8 feet, split core)

Photograph 1
MKE-20-095 (0.0–1.2 feet, intact core)

Photograph 2
MKE-20-095 (0.0–1.2 feet, split core)

Appendix B
Field Records

Daily Log

ANCHOR QEA

Anchor QEA L.L.C.
290 Elwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009 Fax 315.453.9010

PROJECT NAME: KK River and Milwaukee Bay Sampling **DATE:** 8/26/20

SITE ADDRESS: KK River + Milwaukee Bay **PERSONNEL:** JW / JTH

WEATHER: **WIND FROM:** N | NE | E | SE | S | SW | W | NW

SUNNY | CLOUDY | RAIN | ?

LIGHT | MEDIUM | HEAVY

TEMPERATURE: °F 90s . °C [Circle appropriate units]

TIME	COMMENTS
See Notes on bottom of page for detailed logging	
Equipment on site:	
8 AM	- Left Sigma @ ≈ 8:00 AM and took Menominee River East towards the Lake
	- Went to Summerset Lagoon and took drone video of lagoon, north past discovery world and South to Hoan Bridge
	- Continued going South and completed drone video all the way South past Lakeside Power Plant and headed back north
	- took photos + videos of lighthouse and Hoan Bridge area, JW 8/26 ran out of battery and headed back to Sigma
11:15 AM	- Docked at Sigma to charge batteries
12:30 PM	- Returned to boat
	- Began drone video @ Reach 4 and was able to get all video done for Reach 4, 3, 2, & 1.
	- Multiple bridges have very low clearances (Check back of sheet)
4:00 pm	- Returned to Sigma
	- Will review footage and fill in gps tomorrow
Visual Survey: (overland flow, flow from outfalls, impacts,)	
☆	All bridges are easily passable from Sigma office down Menominee River to the Lake except the railroad bridge just east of Plankington Ave. Height from water to underside of bridge is only ≈ 58"
Samples delivered to lab:	

Notes: Work performed, Phone calls made, Problems Issues/Resolutions, Visitors on site, Deviations from the Workplan
Safety infractions, Important comments/instructions to contractors

Signature: _____

From water surface to underside of Bridge

Railroad Bridge east of Plankington Ave. - 58"

W. Cradle Ave. Bridge - 54"

S. 1st St. Bridge (Reach 1) - 76"

W. Beecher St. Bridge - 96"

ANCHOR QEA

DAILY FLOAT PLAN

Today's Date: 8/26/20

Vessel Name: Creek Freak

Operator: JVW / JTH

Departure Time: 8:00 AM **Expected Time of Return:** 4:00 pm

Cell Phone Number(s) 414-588-7178 414-507-8872

Office Contact Person Notified of Departure and Return: Kevin Slattke

Destination and Itinerary:

AM- Milwaukee Bay, Summerfest Lagoon,
PM- Reach 1, 2, 3, + 4

Names of Personnel on Board:

Justin Van Wieringen
JT Holcombe

If expected time of return is exceeded by 1 hour, the following steps will be taken:

1. Office Contact Person will attempt to contact crew members.
2. Office Contact Person will notify Field Manager, if not the same person.

If Office Contact Person is not able to establish contact with crew the following steps will be taken in a logical order:

3. Field Manager will contact Health and Safety Officer.
4. Field Manager will contact Project Manager.
5. Local hospitals and emergency centers will be contacted.
6. Local search and rescue will be notified.

ANCHOR QEA

Small Unmanned Aerial System

Pre-Flight Checklist

Date: 8/26/20 **Remote PIC:** JTH

RPIC Cert. No.: 4013511

Operating Environment

- ☐ Verify that operation will occur in uncontrolled (Class G) airspace
  - ☑ If in controlled airspace (Class, B, C, D, E), has a waiver/authorization been obtained?
- ☑ Check for other flight restrictions (NOTAMs, TFRs)
- ☑ Check weather conditions
- ☑ Check for persons, property, or other ground hazards around the planned operational area
- ☑ Obtain permission from property owner and/or client

Roles and Responsibilities

- ☑ Identify Remote Pilot-in-Command
- ☑ Identify Controller (if different than the Remote PIC), Visual Observer
- ☑ Discuss emergency/contingency procedures, roles and responsibilities, potential hazards
- ☑ Verify availability of required documentation (pilot certificate, sUAS registration, waiver[s])

Inspect Condition of the Aircraft

- ☑ Verify that batteries are charged (Remote Controller, Aircraft Flight Battery, Mobile Device)
- ☑ Verify that airframe structure, including undercarriage, and batteries are in good condition
- ☑ Propellers are mounted correctly and firmly
- ☑ MicroSD card has been inserted, if necessary
- ☑ Gimbal is operating normally
- ☑ Motors can start and are functioning normally
- ☑ Ensure that sensors for the Obstacle Sensing System are clean (if present)
- ☑ Registration markings are properly displayed and legible

Inspect Electronic Connections

- ☑ Verify that flight control app (DJI GO or analogous) is successfully connected to the aircraft
- ☑ Verify communication with an adequate number of GPS satellites (minimum of 4)
- ☑ Check navigation and communication data links between aircraft and control station
- ☑ Calibrate sUAS compass
- ☑ Establish home point; allow a minimum of 60 seconds at the home point location
- ☑ Start propellers to inspect for any imbalance or irregular operation
- ☑ At controlled low altitude, fly within range of any interference & recheck all controls/stability

Daily Log

ANCHOR QEA

Anchor QEA L.L.C.
290 Elwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009 Fax 315.453.9010

PROJECT NAME: KK River and Milwaukee Bay Sampling **DATE:** 8/27/20

SITE ADDRESS: KK River and Milwaukee Bay AOC **PERSONNEL:** JW/JTH

WEATHER: **WIND FROM:** N ~~NE~~ E SE S SW W NW

SUNNY CLOUDY RAIN ?

LIGHT MEDIUM HEAVY

TEMPERATURE: °F 90s . °C [Circle appropriate units]

TIME	COMMENTS
See Notes on bottom of page for detailed logging	
Equipment on site:	

Sample location	water depth	Sed Depth	Sed type
KKR-20-001	9.5'	1.5'	Sand
KKR-20-002	3.0'	0.7'	Sand
KKR-20-003	5.0'	0.7	Sand
KKR-20-004	5.5'	0.2'	Sand
KKR-20-005	7.0	0.5'	SAND
KKR-20-006	7.3'	1.1'	Sand
KKR-20-007	15.5	0.1	Sand
KKR-20-008	6.0	4.3'	silt/sand
KKR-20-009	9.0	1.0	Sand
KKR-20-010	9.0	1.0	Sand
KKR-20-011	10.5	0.9	Sand
KKR-20-012	8.3	4.0'	Sand/silt
KKR-20-013	11.5'	3.5'	silty sand

- Poled each location for sediment (above). Discussed w/ Maggie and she asked to pok the center of the river for the first part of Reach 1 to see if any areas had sediment. Poled every 10-15' and all material was sandy or gravelly.

Visual Survey: (overland flow, flow from outfalls, impacts,)

- Completed Reach 1 recon and completed shoreline feature forms for all shoreline features that were in reach 1. Took photos of each feature and surveyed where possible

~~Samples delivered to lab:~~

- JT completed drone survey of McKinley Marine area
All areas of project have been completed w/ drone

Notes: Work performed, Phone calls made, Problems Issues/Resolutions, Visitors on site, Deviations from the Workplan
Safety infractions, Important comments/instructions to contractors

Signature: _____

ANCHOR QEA

DAILY FLOAT PLAN

Today's Date: 8/27/20

Vessel Name: Creek Freak

Operator: JVW/JTH

Departure Time: 9:00 AM **Expected Time of Return:** 3:50 pm

Cell Phone Number(s) 414-588-7178 414-507-8872

Office Contact Person Notified of Departure and Return: Kevin Slottke

Destination and Itinerary:
Reach 1 - Recon activities

Names of Personnel on Board:
Justin van Weelden
JT Holcombe

If expected time of return is exceeded by 1 hour, the following steps will be taken:

1. Office Contact Person will attempt to contact crew members.
2. Office Contact Person will notify Field Manager, if not the same person.

If Office Contact Person is not able to establish contact with crew the following steps will be taken in a logical order:

3. Field Manager will contact Health and Safety Officer.
4. Field Manager will contact Project Manager.
5. Local hospitals and emergency centers will be contacted.
6. Local search and rescue will be notified.

ANCHOR QEA

Small Unmanned Aerial System

Pre-Flight Checklist

Date: 8/27/20 **Remote PIC:** JTH

RPIC Cert. No.: 40/3511

Operating Environment

- ☐ Verify that operation will occur in uncontrolled (Class G) airspace
  - ☑ If in controlled airspace (Class, B, C, D, E), has a waiver/authorization been obtained?
- ☑ Check for other flight restrictions (NOTAMs, TFRs)
- ☑ Check weather conditions
- ☑ Check for persons, property, or other ground hazards around the planned operational area
- ☑ Obtain permission from property owner and/or client

Roles and Responsibilities

- ☑ Identify Remote Pilot-in-Command
- ☑ Identify Controller (if different than the Remote PIC), Visual Observer
- ☑ Discuss emergency/contingency procedures, roles and responsibilities, potential hazards
- ☑ Verify availability of required documentation (pilot certificate, sUAS registration, waiver[s])

Inspect Condition of the Aircraft

- ☑ Verify that batteries are charged (Remote Controller, Aircraft Flight Battery, Mobile Device)
- ☑ Verify that airframe structure, including undercarriage, and batteries are in good condition
- ☑ Propellers are mounted correctly and firmly
- ☑ MicroSD card has been inserted, if necessary
- ☑ Gimbal is operating normally
- ☑ Motors can start and are functioning normally
- ☑ Ensure that sensors for the Obstacle Sensing System are clean (if present)
- ☑ Registration markings are properly displayed and legible

Inspect Electronic Connections

- ☑ Verify that flight control app (DJI GO or analogous) is successfully connected to the aircraft
- ☑ Verify communication with an adequate number of GPS satellites (minimum of 4)
- ☑ Check navigation and communication data links between aircraft and control station
- ☑ Calibrate sUAS compass
- ☑ Establish home point; allow a minimum of 60 seconds at the home point location
- ☑ Start propellers to inspect for any imbalance or irregular operation
- ☑ At controlled low altitude, fly within range of any interference & recheck all controls/stability

Daily Log

ANCHOR QEA

Anchor QEA L.L.C.
290 Elwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009 Fax 315.453.9010

PROJECT NAME: KK River and Milwaukee Bay Sampling **DATE:** 9/1/20

SITE ADDRESS: Milwaukee Bay **PERSONNEL:** JW/ESP

WEATHER: **WIND FROM:** N | NE | (E) | SE | S | SW | W | NW

SUNNY | (CLOUDY) | RAIN | ?

(LIGHT) | MEDIUM | HEAVY

TEMPERATURE: °F 70s . °C [Circle appropriate units]

TIME	COMMENTS
See Notes on bottom of page for detailed logging	
Equipment on site:	
	MKE-20-084 - 3 samples
	MKE-20-085 - 2 samples
	Samples stored for processing tomorrow.
	MKE-20-086
	MKE-20-087
	MKE-20-088
Visual Survey: (overland flow, flow from outfalls, impacts,)	
Samples delivered to lab:	
	Samples to be shipped tomorrow.

Notes: Work performed, Phone calls made, Problems Issues/Resolutions, Visitors on site, Deviations from the Workplan
Safety infractions, Important comments/instructions to contractors

Signature: _____

Daily Log

ANCHOR QEA

Anchor QEA L.L.C.
290 Elwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009 Fax 315.453.9010

PROJECT NAME: KK River and Milwaukee Bay Sampling **DATE:** 9/2/20

SITE ADDRESS: Milwaukee Bay **PERSONNEL:** JW/ ESP

WEATHER: **WIND FROM:** N | ~~NE~~ | E | SE | S | SW | (W) | NW

(SUNNY) | CLOUDY | RAIN | ?

(LIGHT) | MEDIUM | HEAVY

TEMPERATURE: °F 75-80°. °C
[Circle appropriate units]

TIME	COMMENTS
See Notes on bottom of page for detailed logging	
Equipment on site:	
	MKE-20-086- 2 samples
	MKE-20-087- 3 samples (1 archive)
	MKE-20-088- 3 samples
	MKE-20-088 Geotech - 2 samples
	MKE-20-079- 3 samples
	MKE-20-089- 2 sample
	1 field replicate (0-1')
	MKE-20-090- 4 Samples
	1 Duplicate (1-3')
	1 MS/MSD (3-4.7')
	1 Rinse Blank
Visual Survey: (overland flow, flow from outfalls, impacts,)	
Samples delivered to lab:	
	Samples to be delivered to FedEx

Notes: Work performed, Phone calls made, Problems Issues/Resolutions, Visitors on site, Deviations from the Workplan
Safety infractions, Important comments/instructions to contractors

Signature:

Daily Log

ANCHOR QEA

Anchor QEA L.L.C.
290 Elwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009 Fax 315.453.9010

PROJECT NAME: KK River and Milwaukee Bay Sampling **DATE:** 9/23/20

SITE ADDRESS: MKE Bay + KK River **PERSONNEL:** JW/ESP

WEATHER: **WIND FROM:** N | NE | E | SE | S | (SW) | W | NW

(SUNNY) | CLOUDY | RAIN | ?

(LIGHT) | MEDIUM | HEAVY

TEMPERATURE: °F 70s . °C [Circle appropriate units]

TIME	COMMENTS
See Notes on bottom of page for detailed logging	
Equipment on site:	MKE-20-080 - 2 samples
	1 MS/MSD (0-1')
	MKE-20-081 - 1 sample
	MKE-20-092 - 2 samples
	MKE-20-094 - 2 samples
	1 dup (1-1.8')
	MKE-20-095 - 1 sample
	KKR-20-049 - 3 samples
	1 dup (1-3')
	KKR-20-049 Geo - 3 samples
	KKR-20-068 - 2 samples
	KKR-20-065 - 4 samples
	1 MS/MSD (3-5')
	* KKR-20-055 - 4 samples
	KKR-20-056 - 1 sample
	KKR-20-057 - 1 sample
	3 Equipment Rinse Blanks
Visual Survey: (overland flow, flow from outfalls, impacts,)	
	* Open core photo was missed. Got a photo of half the open core with ≈ 1.7' removed from the top.
Samples delivered to lab:	
	Samples sent Priority Overnight via Fed Ex

Notes: Work performed, Phone calls made, Problems Issues/Resolutions, Visitors on site, Deviations from the Workplan
Safety infractions, Important comments/instructions to contractors

Signature: _____

ANCHOR QEA

Sediment Core Collection Log

Job: KK River - Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard - AQ
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-084
Attempt No. 1
Date: 9/1/20 1125
Logged By: SBallard
Horizontal Datum: Wisconsin State plane South

Field Collection Coordinates:
Lat/Northing: 43.029189594°N
382199.83 N

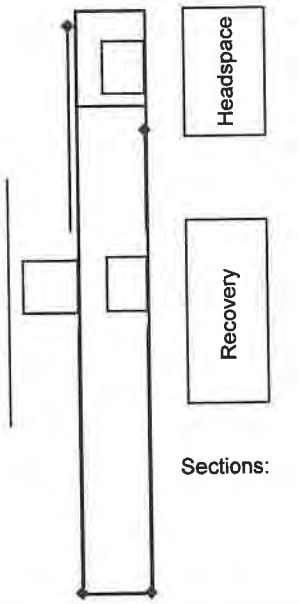
Long/Easting: 87.89667056°W
~~252~~30840.37 E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 22.7 ft

B. Lake Level Measurements
Time: 1125
Height: 582.3 ft IGLD
(NOAA gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / (No)
Core Tube Length: 12 foot
Drive Penetration: 5.1 ft
Headspace Measurement: 7.9 ft
Recovery Measurement: -4.1 ft
Recovery Percentage: 80%
Total Length of Core To Process: 41 ft



Drive Notes: drive core
pneumatic ~~piston~~ SS sampler - core tube driven to refusal at 5.1 ft below mud surface

0.7 ft material lost out of bottom upon retrieval

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Soft mud at surface sandy material below

CORE REJECTED AND DISCARDED

Notes:
Core rejected because of loss out the bottom

ANCHOR QEA

Sediment Core Collection Log

Job: KK River and Milwaukee Bay
Job No: 201779-02.01
Field Staff: S Ballard - AQ
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-084
Attempt No. 2
Date: 9/1/20 1200
Logged By: SBallard
Horizontal Datum: WI State Plane South

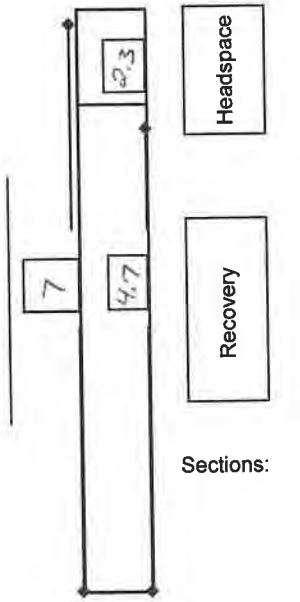
Field Collection Coordinates:
Lat/Northing: 382199.83
Long/Easting: 2530840.37

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 22.7 ft

B. Lake Level Measurements
Time: 1200
Height: 582.1 ft LGLD
NOAA gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / No
Core Tube Length: 7 ft
Drive Penetration: 5.0 ft
Headspace Measurement: 2.3 ft
Recovery Measurement: 4.7 ft
Recovery Percentage: 94%
Total Length of Core To Process: 4.7 ft



Drive Notes: drive core
pneumatic ~~piston~~ sampler -
Core driven to refusal.
Stiff clay layer encountered

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Medium brown finer sediment on surface. Bottom of core is light tan sandy clay with some gravel

Native layer depth appears to be 1.8 ft

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard - AQ
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-085
Attempt No. 1
Date: 9/1/20 1745
Logged By: SBallard
Horizontal Datum: WI State Plane South

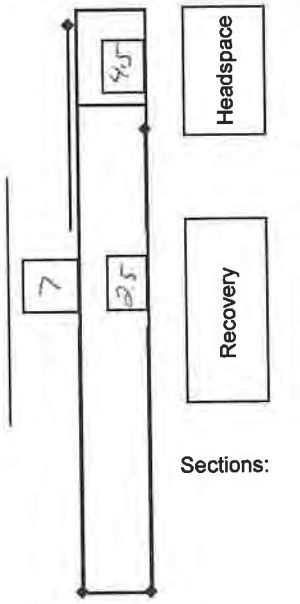
Field Collection Coordinates:
Lat/Northing: 382558.89
Long/Easting: 2530737.04

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 16.6 ft

B. Lake Level Measurements
Time: 12:48
Height: 581.9 IGLD
NOAA tide gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / No
Core Tube Length: 7 ft
Drive Penetration: 2.5 ft
Headspace Measurement: 4.5 ft
Recovery Measurement: 2.5 ft
Recovery Percentage: 100%
Total Length of Core To Process: 2.5 ft



Drive Notes:
pneumatic drive core sampler
Core tube driven to refusal at 2.5 ft below mud surface

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Medium brown fine Sediment in top 6" of core. Bottom of core is light gray firm clay.

Fine sand from approximately 0.5 - 2.0 ft, transitioning to hard clay from 2.0 - 2.5 ft

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-0201
Field Staff: SBallard - AQ
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-086
Attempt No. 1
Date: 9/1/20 1400
Logged By: SBallard
Horizontal Datum: WI State Plane South

Field Collection Coordinates:
Lat/Northing: 382805.01

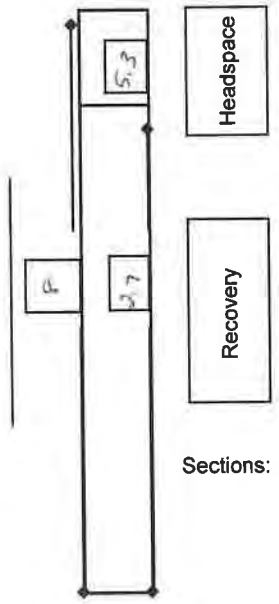
Long/Easting: 2530963.57

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 18.1 ft

B. Lake Level Measurements
Time: 1400
Height: 582.1 ft IGLD
NOAA gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 8 ft
Drive Penetration: 2.7 ft
Headspace Measurement: 5.3 ft
Recovery Measurement: 2.7 ft
Recovery Percentage: 100 %
Total Length of Core To Process: 2.7 ft



Drive Notes:
Pneumatic Drive core:
Core driven to refusal at 2.7 ft
Stiff clay layer encountered

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

medium brown fine grained material on surface transitioning to light gray fine sand.
At 1 foot below mudline, sandy clay (light gray) to bottom of core.
2.1 to 2.7 feet appears to have higher clay content.

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-087
Attempt No. 1
Date: 9/1/20 1440
Logged By: SBallard
Horizontal Datum:

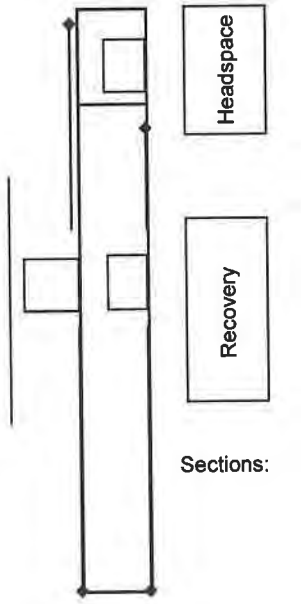
Field Collection Coordinates:
Lat/Northing: 383040.58
Long/Easting: 2530591.86

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 15.4 ft

B. Lake Level Measurements
Time:
Height:

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / (No)
Core Tube Length: 12'
Drive Penetration:
Headspace Measurement:
Recovery Measurement:
Recovery Percentage:
Total Length of Core To Process:



Sections:

Drive Notes:
Pneumatic Drivecore

Core driven to refusal ~~at~~

Bottom of core fell out upon retrieval - CORE REJECTED

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

CORE REJECTED DUE TO LOSS OF MATERIAL

Bottom of core was sand (large grained) and gravel

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-087
Attempt No. 2
Date: 9/11/20 1455
Logged By: SBallard
Horizontal Datum: WI State Plane

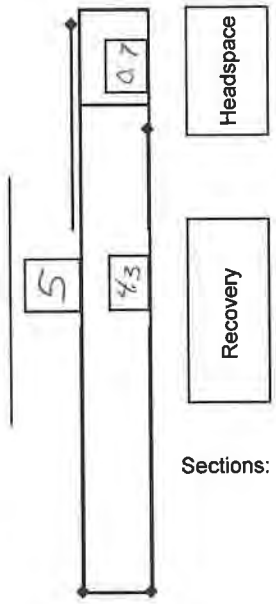
Field Collection Coordinates:
Lat/Northing: 383040.58
Long/Easting: 2530591.86

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 15.4 ft

B. Lake Level Measurements
Time: 1500
Height: 582.0 ft

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 5 ft
Drive Penetration: 4.4 ft
Headspace Measurement: 0.7 ft
Recovery Measurement: 4.3 ft
Recovery Percentage: 98%
Total Length of Core To Process: 4.3 ft



Drive Notes:
Pneumatic drive core
Core driven to refusal at 4.3 ft
Stiff clay encountered at bottom of core

Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
0-1 ft- medium gray to light gray sand	
1-1.5 ft- light gray sand layer with gravel	
1.5-4.3 ft light gray clay with dark gray streaks throughout	

Notes: Refusal at 4.3 ft

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-088-CORE A
Attempt No. 1
Date: 9/1/20 1540
Logged By: SBallard
Horizontal Datum: WI State plane South

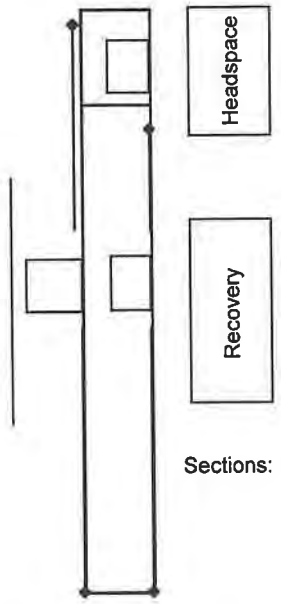
Field Collection Coordinates:
Lat/Northing: 383592.26
Long/Easting: 2530772.42

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 14.0 ft

B. Lake Level Measurements
Time:
Height:

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes (No)
Core Tube Length:
Drive Penetration:
Headspace Measurement:
Recovery Measurement:
Recovery Percentage:
Total Length of Core To Process:



Sections:

Drive Notes:

Core driven to refusal

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

CORE REJECTED DUE TO LOSS OF MATERIAL

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: S Ballard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-088-COREA
Attempt No. 2
Date: 9/1/20 1605
Logged By: SBallard
Horizontal Datum: WI State Plane South

Field Collection Coordinates:
Lat/Northing: 383592.26
Long/Easting: 2530772.42

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 140 ft

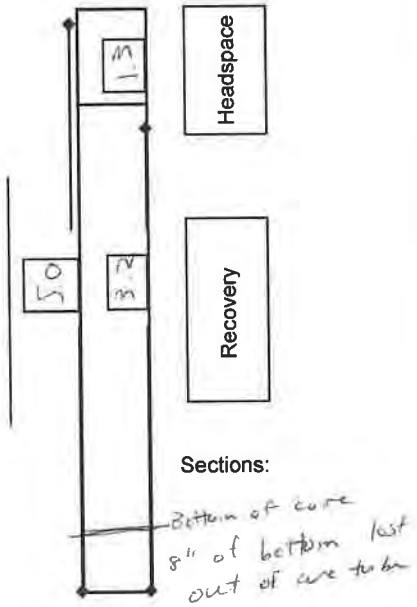
B. Lake Level Measurements
Time:
Height:

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / (No)
Core Tube Length: 5.0
Drive Penetration: 3.7
Headspace Measurement: 1.3
Recovery Measurement: 3.2
Recovery Percentage: 86%
Total Length of Core To Process:

Drive Notes:
pneumatic drive core

driven to refusal at 3.7 ft



Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

8" of material lost and bottom of core - bottom material is coarse sand w/ gravel

BORE REJECTED DUE TO LOSS OF MATERIAL

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River & Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-088 CORE A
Attempt No. 3
Date: 9/1/20 1615
Logged By: SBallard
Horizontal Datum: WI State Plane South

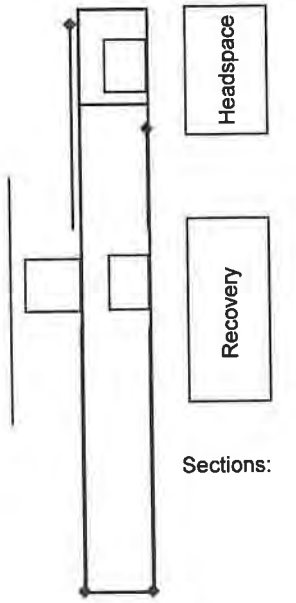
Field Collection Coordinates:
Lat/Northing: 383592.26
Long/Easting: 2530772.42

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 14.0 ft

B. Lake Level Measurements
Time: 1618
Height: 582.3 ft IGLD
NOAA tide gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 5.0 ft
Drive Penetration: 4.6' ft
Headspace Measurement: 0.9 ft
Recovery Measurement: 4.1'
Recovery Percentage: 89%
Total Length of Core To Process: 4.1 ft



Drive Notes:
pneumatic drive corer
core pushed to refusal at 4.1 ft

Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
0-3.5 ft - fine grained sand	
layer of light gray fine sand with clay from 1-1.7 ft	
3.5-4.1 ft - sand with many gravel - large rock in bottom of core	

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: S Ballard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-088 CORE B
Attempt No. 1
Date: 9/1/20 1645
Logged By: SBallard
Horizontal Datum: WI State Plane South

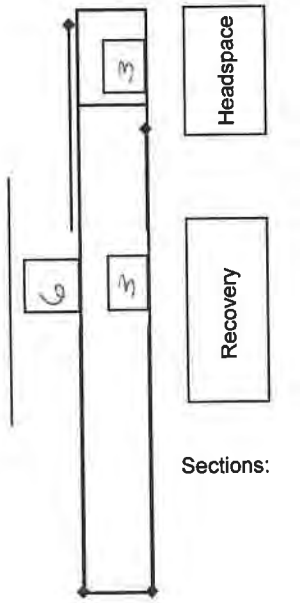
Field Collection Coordinates:
Lat/Northing: 383592.26
Long/Easting: 2530772.42

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 14.0 ft

B. Lake Level Measurements
Time: 1648
Height: 582.1 ft

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 6
Drive Penetration: 3.9
Headspace Measurement: 3.0 ft
Recovery Measurement: 3.0
Recovery Percentage: 77%
Total Length of Core To Process: 3.0 ft



Drive Notes:
pneumatic drive corer
Core driven to refusal at 3.9 ft

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

entire core made up of sandy material.
bottom 6" of core had many gravel
light gray sand layer with clay in top 1.5 ft of core

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River - Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-089
Attempt No. 1
Date: 9/2/20 0915
Logged By: S Ballard
Horizontal Datum: WI State Plane South

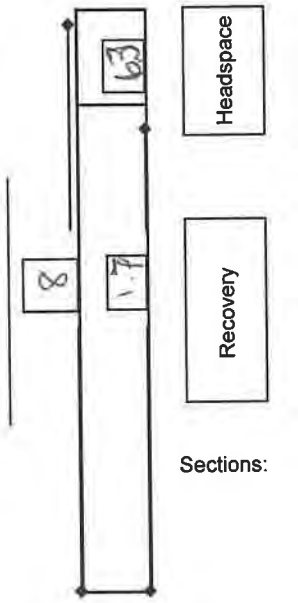
Field Collection Coordinates:
Lat/Northing: 384252.42
Long/Easting: 2531001.93

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 16.3 ft

B. Lake Level Measurements
Time: 912
Height: 582.05 ft IGLD
NOAA tide gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / No
Core Tube Length: 8.0 ft
Drive Penetration: 1.7 ft
Headspace Measurement: 6.3 ft
Recovery Measurement: 1.7 ft
Recovery Percentage: 100%
Total Length of Core To Process: 1.7 ft



Drive Notes:
pneumatic drive corer

core pushed to refusal at 1.7 ft

Hammer driver required from sediment surface - no soft material on top

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-0.1 light tan silt on very surface of core
0.1-1.7 ft - tan very stiff clay - very hard

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KR River + Milwaukee Bay
Job No: 201779-02 01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-090
Attempt No. 1
Date: 9/2/20 945
Logged By: SBallard
Horizontal Datum: WI State Plane SouK

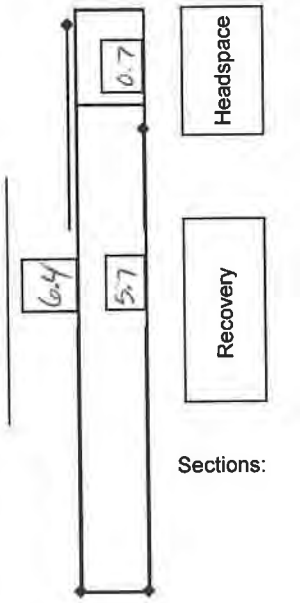
Field Collection Coordinates:
Lat/Northing: 384764.29
Long/Easting: 2530865.84

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 19.0 ft

B. Lake Level Measurements
Time: 942
Height: 581.9 ft IGLD
NOAA tide gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 6.4 ft
Drive Penetration: 6.0 ft
Headspace Measurement: 0.7 ft
Recovery Measurement: 5.7 ft
Recovery Percentage: 95%
Total Length of Core To Process: 5.7 ft



Drive Notes:
Top 4 ft of penetration required minimal hammering

Remainder of core required constant hammering and additional pressure

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Top of core came into contact with gasket at top of core tube - additional core attempts will be made

Apparent native layer at 3.7 ft

CORE ACCEPTED

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-090
Attempt No. 2
Date: 9/2/20 1000
Logged By: SBallard
Horizontal Datum: WI State Plane South

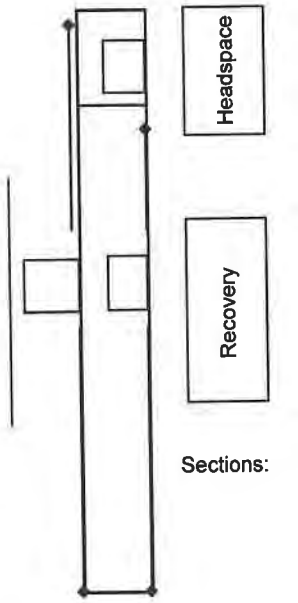
Field Collection Coordinates:
Lat/Northing: 384764.29
Long/Easting: 2530865.84

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 19.0 ft

B. Lake Level Measurements
Time:
Height:

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes (No)
Core Tube Length: 8.0
Drive Penetration: 6.0
Headspace Measurement:
Recovery Measurement: 4.7
Recovery Percentage: 78%
Total Length of Core To Process: N/A



Sections:

Drive Notes:
Top 4 feet required minimal hammering
Remainder of core required constant hammering and additional pressure
Core pushed to refusal

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Approximately 1 foot of material lost out bottom of core upon retrieval

CORE REJECTED DUE TO LOSS OF MATERIAL FROM BOTTOM

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-090
Attempt No. 3
Date: 9/2/20 1015
Logged By: SBallard
Horizontal Datum: WI State Plane South

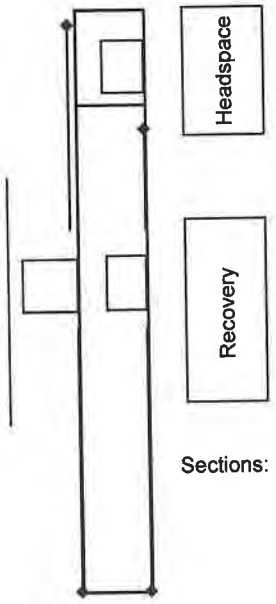
Field Collection Coordinates:
Lat/Northing: 384764.29
Long/Easting: 2530865.84

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 19.0 ft

B. Lake Level Measurements
Time:
Height:

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / (No)
Core Tube Length: 8.0
Drive Penetration: 10.0
Headspace Measurement: 4.9
Recovery Measurement: 3.1
Recovery Percentage: 52%
Total Length of Core To Process: N/A



Sections:

Drive Notes:
Hand push for top 3 ft
minimal hammering for 2 ft
constant hammering and additional pressure for remainder of core
Core pushed to refusal

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

core did not collect soft sediment at surface - recovery percentage too low

CORE REJECTED

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: SBallard
Contractor: GLEC
Vertical Datum:

Station ID: MKE-90-091
Attempt No. 1
Date: 9/2/20 1115
Logged By: SBallard
Horizontal Datum: WI State Plane South

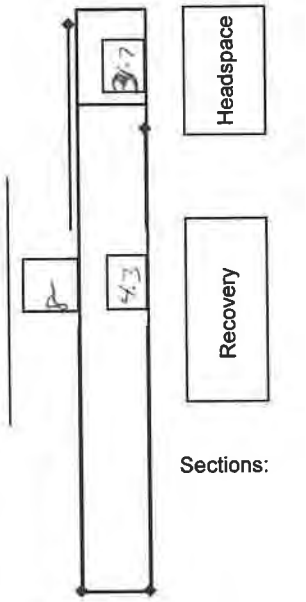
Field Collection Coordinates:
Lat/Northing: 384919.47
Long/Easting: 2531375.92

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 23.7 ft

B. Lake Level Measurements
Time: 1112
Height: 582.07 ft IGLD
NOAA tide gauge 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / No
Core Tube Length: 8.0 ft
Drive Penetration: 4.3 ft
Headspace Measurement: 3.7 ft
Recovery Measurement: 4.3 ft
Recovery Percentage: 4.3 100%
Total Length of Core To Process:



Drive Notes: Pneumatic direct corer
Top 1-2 feet required minimal hammering
remainder of core required constant hammering and additional pressure
core driven to refusal

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Apparent native layer at 3.7 ft

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: Chris Barnes
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-S20
Attempt No. 1
Date: 9/22/20
Logged By: Chris. Barnes
Horizontal Datum: WI State Plane South

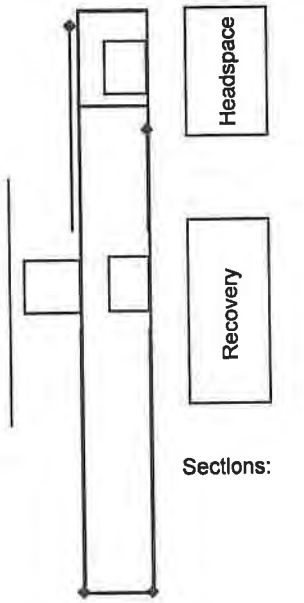
Field Collection Coordinates:
Lat/Northing: 386744.79 ft N
Long/Easting: 2531766.63 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 14.3 ft

B. Lake Level Measurements
Time: 08:06 am
Height: 581.77 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 8 ft
Drive Penetration: 2.3 ft
Headspace Measurement: 6 ft
Recovery Measurement: 2 ft
Recovery Percentage: 87%
Total Length of Core To Process: 2ft



Drive Notes:

Core to refusal

Moved 10 ft east toward Bay (away from shore) due to rocks at original location

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-2ft: Clayey Sand (fine to med grain) w/ Some Silt, Tan / light Brown color

- Very bottom of the core contains shells & shell fragments

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: Chris Barnes
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-S1
Attempt No.
Date: 9/22/20
Logged By: Chris Barnes
Horizontal Datum: WI State Plane South

Field Collection Coordinates:
Lat/Northing: 385889.98 ft N

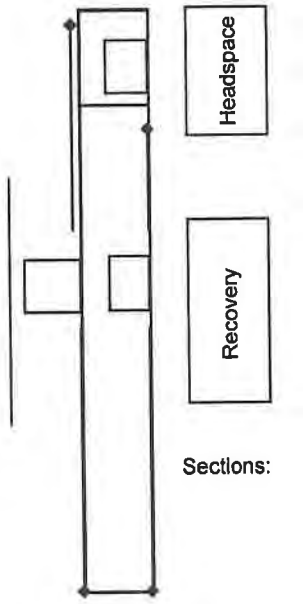
Long/Easting: 2531406.72 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 18.9 ft

B. Lake Level Measurements
Time: 09:18 am
Height: 581.79 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes / No
Core Tube Length: 6.1 ft
Drive Penetration: 0.7 ft
Headspace Measurement:
Recovery Measurement: 0.5 ft
Recovery Percentage:
Total Length of Core To Process:



Drive Notes:

Low to refusal

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Core Rejected

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: Chris Barnes
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-81
Attempt No. 2
Date: 9/22/20
Logged By: Chris. Barnes
Horizontal Datum: WI State Plane South

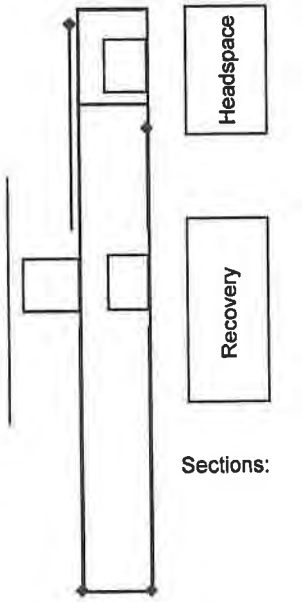
Field Collection Coordinates:
Lat/Northing: 385889.98 ft N
Long/Easting: 2531406.72 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 12.9 ft

B. Lake Level Measurements
Time: 09:18 am
Height: 581.79 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: Yes (No)
Core Tube Length: 6.1 ft
Drive Penetration: 0.3 ft
Headspace Measurement:
Recovery Measurement: 0.7 ft
Recovery Percentage:
Total Length of Core To Process:



Drive Notes:
Core to refusal

Core Field Observations and Description:
Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

Core Rejected

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-07.01
Field Staff: Chris Barnes
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-81
Attempt No. 3
Date: 9/22/20
Logged By: Chris Barnes
Horizontal Datum: WI State Plane South

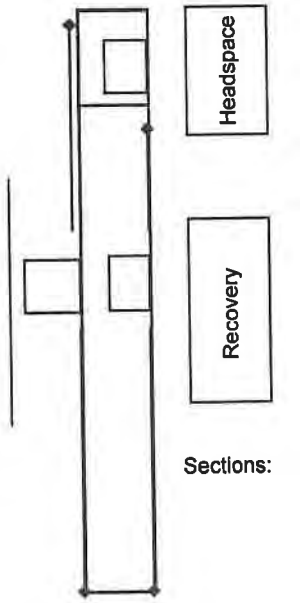
Field Collection Coordinates:
Lat/Northing: 385889.98 ft N
Long/Easting: 2531406.72 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 12.9 ft

B. Lake Level Measurements
Time: 09:18 am
Height: 581.79 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 3.3 ft
Drive Penetration: 1.2 ft
Headspace Measurement: 2.2 ft
Recovery Measurement: 1.1 ft
Recovery Percentage: 92%
Total Length of Core To Process: 1.1 ft



Drive Notes:
Core to refusal

Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
0-0.5 ft: Black / Dark Brown Sand (fine to med. grain) w/ Some Silt	
0-1.1 ft: Tan / Brown clayey Sand (fine to med. grain), w/ Some Silt & Shell fragments	

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: Chris Barnes
Contractor: GLEC
Vertical Datum:

Station ID: MKE-22-92
Attempt No. 1
Date: 9/22/20
Logged By: Chris Barnes
Horizontal Datum: WI State Plane South

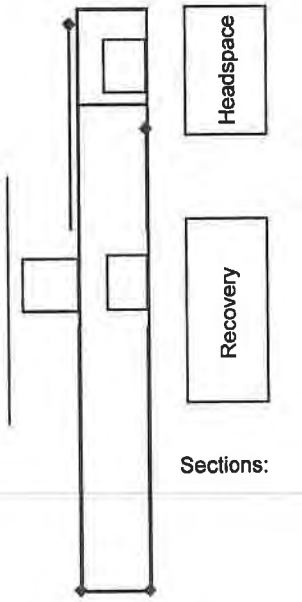
Field Collection Coordinates:
Lat/Northing: 383751.32 ft N
Long/Easting: 2531541.62 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 19.4 ft

B. Lake Level Measurements
Time: 10:06 am
Height: 581.75 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 8 ft
Drive Penetration: 2.2 ft
Headspace Measurement: 6.1 ft
Recovery Measurement: 1.9 ft
Recovery Percentage: 86%
Total Length of Core To Process: 1.9 ft



Drive Notes:
Core to refusal

Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
0 - 1.1 ft: Hard Tan/Gray clay w/ Some fine Sand & Silt	
1.1 - 1.9 ft: Dark Brown/Black clayey Sand (fine to med. grain) w/ Some Silt, Shells & Shell fragments	

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KIS River + Milwaukee Bay
Job No: 201779-02.01
Field Staff: Chris Barnes
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-94
Attempt No. 1
Date: 9/22/20
Logged By: Chris Barnes
Horizontal Datum: WI State Plane South

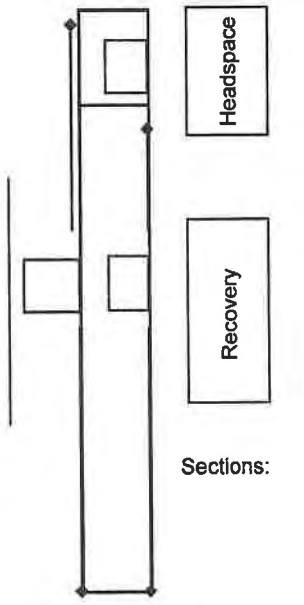
Field Collection Coordinates:
Lat/Northing: 382731.64 ft N
Long/Easting: 2531871.70 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 22.1 ft

B. Lake Level Measurements
Time: 10:48 am
Height: 581.79 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 5.9 ft
Drive Penetration: 2 ft
Headspace Measurement: 4.1 ft
Recovery Measurement: 1.8 ft
Recovery Percentage: 90%
Total Length of Core To Process: 1.8 ft



Drive Notes:
Core to refusal

Core Field Observations and Description:

Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-0.9 ft: Tan / light Brown hard clay w/ some silt & fine Sand

0.9-1.8 ft: Clayey Sand (fine to med. grain) w/ some silt, Top has a lot of shells & shell fragments.

Notes:

ANCHOR QEA

Sediment Core Collection Log

Job: KK River + Milwaukee Bay
Job No: 20177 9-D2.121
Field Staff: Chris Barnet
Contractor: GLEC
Vertical Datum:

Station ID: MKE-20-95
Attempt No. 1
Date: 9/22/20
Logged By: Chris Barnet
Horizontal Datum: WI State Plane South

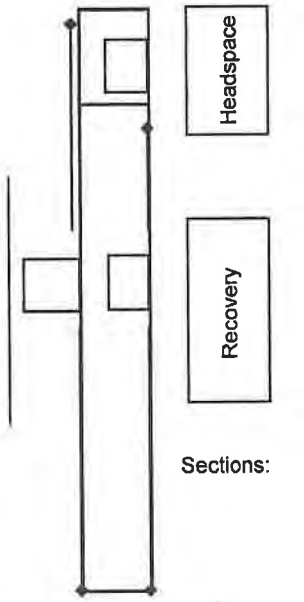
Field Collection Coordinates:
Lat/Northing: 381965.78 ft N
Long/Easting: 2531385.43 ft E

A. Water Depth
DTM Depth Sounder:
DTM Lead Line: 20.6 ft

B. Lake Level Measurements
Time: 11:36 am
Height: 581.73 ft
NOAA 9087057

C. Mudline Elevation

Core Collection Recovery Details:
Core Accepted: (Yes) / No
Core Tube Length: 3.9 ft
Drive Penetration: 1.2 ft
Headspace Measurement: 2.7 ft
Recovery Measurement: 1.2 ft
Recovery Percentage: 100 %
Total Length of Core To Process: 1.2 ft



Drive Notes:
Core to refusal

Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
0 - 1.2 ft: Tan / light Brown hard clay wi some fine Sand, shells + shell fragments	

Notes:

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No.
No. of Sections: 1
Drive Length: 5.0 ft
Recovery: 4.7 ft
% Recovery: 94%
Notes:

Station ID: MKE-20-084
Date/Time: 9/1/20 12:10
Core Logged By: ESP/JVW
Attempt #: 1
Type of Core | Direct Push | Vibracore | Diver Core
Diameter of Core (inches) 4"
Core Quality | Good | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-1.1 Soft, wet, grey-brown clayey SILT with ~~occasional~~ sand,		0	TV=0 PP=0	
				1.1-2.6 soft, moist, grey, clayey SILT, trace organics (wood), trace anthropogenics (plastic bag), trace shells		0.8	TV=0.02 tons/ft² PP=0	
				2.6-4.7 medium ~~stiff~~ ESP dense SAND, moist, light grey-brown sandy CLAY ~~silty SAND~~ ESP, with trace shell fragments		0	TV=0.09 tons/ft² PP=1.7 tons/ft²	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19333
No. of Sections: 1
Drive Length: 2.5
Recovery: 2.5
% Recovery: 100%
Notes:

Station ID: MKE-20-085
Date/Time: 9/1/20
Core Logged By: ESP 16:30
Attempt #: 1
Type of Core (Direct Push) | Vibracore | Diver Core
Diameter of Core (inches) 4
Core Quality (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.5 Very soft, wet, grey-brown clayey SILT with occasional sand		0	TV: 0 ~~kg~~/cm² PP: 0 T/ft²	
				0.5-1.2 Medium stiff, ESP? moist, grey sandy SILT with trace shell fragments intermixed with medium dense, moist, light brown silty SAND with trace shell fragments				
				1.2-~~2.0~~ ESP 1.9 medium dense, moist, light brown silty SAND		0		
				1.9-2.5 stiff, moist, light brown, ~~silty CLAY~~ ESP? clayey SILT			TV: 0.25 kg/cm² PP: 2.5 T/ft²	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19333
No. of Sections: 1
Drive Length: 2.7
Recovery: 2.7
% Recovery: 100%
Notes:

Station ID: MKE-20-086
Date/Time: 9/2/20 8:10
Core Logged By: ESP
Attempt #: 1
Type of Core (Direct Push) Vibracore | Diver Core
Diameter of Core (inches) 4
Core Quality (Good) Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				ESP			0-1'	
				0-~~0.7~~ 1 Very soft, wet, grey-brown clayey SILT with trace sand & gravel		0	TV: 0 PP: 0	
				3" x 3" cobble 0.7-1				
				1-2.7 stiff, moist, light brown clayey SILT		0	1-2.7' TV: 0.23 tsf PP: 1.5+ tsf	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19333
No. of Sections: 1
Drive Length: 4.4
Recovery: 4.3
% Recovery: 98%
Notes:

Station ID: MKE-20-087
Date/Time: 9/2/20 9:30
Core Logged By: ESP
Attempt #: 2
Type of Core: (Direct Push) | Vibracore | Diver Core
Diameter of Core (inches): 4
Core Quality: (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				Medium dense, moist 0-0.6 Dark grey-brown silty fine SAND with trace shells 0.6-0.9 As above, light grey/tan 0.9-1.4 ESP ~~Grey~~ Medium dense, moist, grey slightly gravelly coarse SAND, ESP ~~subangular to~~ subrounded, trace shells, trace silt & clay 1.4-4.3 Stiff to hard, moist, light greyish brown, silty CLAY		0 0 0	0-1.4' TV: NA PP: NA 1.4-3' TV: 0.3 kg/cm² PP: 1.4 T/ft² 3-4.3' TV: 0.29 kg/cm² PP: 1.2 T/ft²	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19333
No. of Sections: 1
Drive Length: 4.6
Recovery: 4.1
% Recovery: 89%
Notes:

Station ID: MKE-20-088
Date/Time: 9/2/20 10:40
Core Logged By: ESP
Attempt #: 3
Type of Core (Direct Push) Vibracore Diver Core
Diameter of Core (inches) 4
Core Quality (Good) Fair Poor Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				medium dense, moist, grey				
				0-1.4 ESP ~~Grey, moist~~, slightly silty SAND, fine-grained, trace shell fragments		0	0-1' TV: NA PP: NA	
				1.4-2.1 ~~light~~ ESP Medium dense, moist, light grey silty Gravelly SAND,		0	1-3' TV: NA PP: NA	
				2.1-4.1 Dense, moist, grey, slightly silty SAND, 4" cobble at bottom		0	3-4.1' TV: NA PP: NA	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19303
No. of Sections: 1
Drive Length: 3.9
Recovery: 3.0
% Recovery: 77%
Notes:

Station ID: MKE-20-088 Geo
Date/Time: 9/21/20
Core Logged By: ESP 11:30
Attempt #: 1
Type of Core (Direct Push) Vibracore Diver Core
Diameter of Core (inches): 4
Core Quality (Good) Fair Poor Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.75 Medium dense, moist, grey silty SAND with trace clay		0	0-1 TV:NA PP:NA	
				0.75-1 Medium dense, moist, light grey silty sandy GRAVEL				
				1-3.0 Medium dense, moist, grey, slightly silty SAND		0	1-3 TV:NA PP:NA	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19533
No. of Sections: 1
Drive Length: 1.7
Recovery: 1.7
% Recovery: 100%
Notes:

Station ID: MKE-20-089
Date/Time: 9/21/20
Core Logged By: ESP
Attempt #: 1
Type of Core: (Direct Push) | Vibracore | Diver Core
Diameter of Core (inches): 4
Core Quality: (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				ESP 0-1.7 ~~Moist,~~ Stiff to med. stiff, moist, light brown silty CLAY		0 0	0-1 TV: 0.24 PP: 2.7 (Field Replicate) 1-1.7 TV: 0.3 PP: 0.6	

Sediment/Soil Core Processing Log

KK River and Milwaukee

ANCHOR QEA

Job: Bay Sampling	Station ID: MKE-20-090		
Job No. 19333	Date/Time: 9/2/20		
No. of Sections: 1	Core Logged By: ESP		
Drive Length: 6.0	Attempt #: 1		
Recovery: 5.7	Type of Core (Direct Push)	Vibracore	Diver Core
% Recovery: 95%	Diameter of Core (inches) 4		
Notes:	Core Quality (Good)	Fair	Poor / Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-1 Soft, wet, grey-brown, Sandy SILT with trace clay, trace organics/plant matter)		0	0-1 TV: 0.05 PP: 0	
				1-3.9 Soft, moist, grey clayey SILT, with trace shell fragments		0	1-3 TV: 0.09 PP: 0	
				3.9-4.7 Medium dense moist, brown-grey silty SAND with darker grey laminated beds		0	3-4.7 TV: 0.05 PP: 0.9	
				4.7-5.7 Dense, moist, brown-grey ESP ~~slightly~~ SAND w/ trace silt		0	4.7-5.7 TV: 0.1 PP: 0.5	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee

Job: Bay Sampling
Job No. 19333
No. of Sections: 1
Drive Length: 4.3
Recovery: 4.3
% Recovery: 100%
Notes:

Station ID: MKE-20-091
Date/Time: 9/2/20 8:00
Core Logged By: ESP
Attempt #: 1
Type of Core (Direct Push) Vibracore Diver Core
Diameter of Core (inches) 4
Core Quality (Good) Fair Poor Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.2 Very soft, wet, grey-brown clayey SILT 0.2-~~0.8~~ ESP 0.7 As above, soft, moist, dark grey to light grey 0.7-3.1 As above, dark grey trace shells, trace organics (plant matter) 3.1-4.3 Medium stiff, moist, light grey-brown slightly sandy silty clay < 0.1-in thick coarse sand bed at top, tr. gravel		0 0 0	0-1 TV 0 PP: 0 1-3.1 TV 0.05 PP: 0 3.1-4.3 TV 0.28 PP: 0.5	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee

Job: Bay Sampling
Job No. 16333
No. of Sections: 1
Drive Length: 2.3
Recovery: 2.0
% Recovery: 87%
Notes:

Station ID: MKE-20-080
Date/Time: 9/23/20 8:30
Core Logged By: ESP
Attempt #: 1
Type of Core | Direct Push | (Vibracore) | Diver Core
Diameter of Core (inches) 4
Core Quality | (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.5 Medium dense, moist, dark grey silty ~~fi~~ ESP SAND, fine to very fine, with trace shells 0.0.3, light brown / tan surficial color		0	0-1 TV:NA PP:NA	
				0.5-2 Dense, moist, grey slightly silty SAND, fine to very fine, with trace shells		0	1-2 TV:NA PP:NA	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee

Job: Bay Sampling
Job No. 19333
No. of Sections: 1
Drive Length: 1.2
Recovery: 1.1
% Recovery: 92%
Notes:

Station ID: MKE-20-081
Date/Time: 9/23/20
Core Logged By: ESP
Attempt #: 1
Type of Core | Direct Push | (Vibracore) | Diver Core
Diameter of Core (inches): 4
Core Quality | (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
0.5				0-~~0.8~~ ESP Medium dense, moist brown grey silty SAND, fine to very fine trace shells 0.5-0.8 As above, dense, dark grey 0.8-1.1 As above, ESP moderate shells		0	0-1.1 TV: NA PP: NA	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee

Job: Bay Sampling
Job No. 14353
No. of Sections: 1
Drive Length: 2.2
Recovery: 1.9
% Recovery: 86%
Notes:

Station ID: MKE-20-092
Date/Time: 9/23/20 9:40
Core Logged By: ESB
Attempt #: 1
Type of Core: Direct Push | (Vibracore) | Diver Core
Diameter of Core (inches): 4
Core Quality: (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.2 Very loose, wet grey silty SAND with trace shells		0	0-1.2 TV: 0.15 PP: 0.2	
				0.2-0.7 As above, dark brown-grey, loose, trace organics (plant matter)				
				0.7-1.2 As above with interlmixed stiff, moist, light brown silty CLAY				
				1.2-1.9 stiff, moist light brown silty CLAY (native)		0	1.2-1.9 TV: 0.31 PP: 0.4	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee

Job: Bay Sampling
Job No. 12333
No. of Sections: 1
Drive Length: 2.0
Recovery: 1.8
% Recovery: 90%
Notes:

Station ID: MKE-20-094
Date/Time: 9/23/20 10:20
Core Logged By: ESP
Attempt #: 1
Type of Core | Direct Push | (Vibracore) | Diver Core
Diameter of Core (inches) 4
Core Quality | (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.9 Very soft, wet dark brown-grey clayey SILT with moderate ~~organics~~ ESP shells, trace organics (plant matter)		0	0-1 TV:0 PP:0	
				0.9-1 Loose, moist, dark grey silty sand w/ intermixed light brown silty SAND, very fine				
				1-1.8 Medium dense, moist, light brown silty SAND, very fine-grained, trace gravel		0	1-1.8 TV:NA PP:NA	

Sediment/Soil Core Processing Log

ANCHOR QEA

KK River and Milwaukee
Job: Bay Sampling
Job No. 19353
No. of Sections: 1
Drive Length: 1.2
Recovery: 1.2
% Recovery: 100%
Notes:

Station ID: MKE-20-095
Date/Time: 9/23/20 11:10
Core Logged By: BSP
Attempt #: 1
Type of Core | Direct Push | (Vibracore) | Diver Core
Diameter of Core (inches): 4
Core Quality | (Good) | Fair | Poor | Disturbed

Recovered Length (cm)	Size % Gravel	Size % Sand	Size % Fines	Classification and Remarks (Density, Moisture, Color, Minor Constituent, MAJOR Constituent, with Additional Constituents, Sheen, Odor)	Recovered Length (cm)	PID	Sample	Summary Sketch
				0-0.1 Very soft, wet, light brown silty CLAY with occasional gravel, occasional shells 0.1-1.2 Stiff to very stiff, moist, light brown slightly sandy silty CLAY		0	0-1.2 N: 03 PP: 1.3	

Appendix C
Sediment Core Logs

Sediment Core Log
MKE-20-080

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **8.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **567.41**	Penetration Depth (ft): **2.30**
Project #: **201779-01.02**	Water Depth (ft): **14.3**	Field Recovery Length (ft): **2.00**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **386741.733**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/22/2020**	Easting / Longitude: **2531763.524**	Process Date: **9/23/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
567	0	MKE-20-080-C-00-01-200923	Sediment	0.0-0.5 ft medium dense, moist, dark grey, silty SAND, fine to very fine, trace shells at 0-0.3 feet, light brown/tan surficial color	0	NA/NA
	1	MKE-20-080-C-01-02-200923		0.5-2.0 ft dense, moist, grey slightly silty SAND, fine to very fine, trace shells	0	NA/NA
566	2			Native material not encountered		

ANCHOR QEA

290 Elmwood Davis Road, Suite 340
Liverpool, NY 13088
Phone 315.453.9009 Fax 315.453.9010

Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
2.00 ft /2.30 ft
87%
See Recovered Interval Column

Sediment Core Log
MKE-20-081

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **3.30**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **568.95**	Penetration Depth (ft): **1.20**
Project #: **201779-01.02**	Water Depth (ft): **12.9**	Field Recovery Length (ft): **1.10**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **385854.443**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/22/2020**	Easting / Longitude: **2531336.539**	Process Date: **9/23/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
568	0 1	MKE-20-081-C-00-1.1-200923	Sediment	0.0-0.5 ft medium dense, moist, brown-grey, silty SAND, fine to very fine, trace shells 0.5-0.8 ft dense, moist, dark grey, silty SAND, fine to very fine, trace shells 0.8-1.1 ft dense, moist, dark grey, silty SAND, fine to very fine, moderate shells Native material not encountered	0	NA/NA

ANCHOR QEA

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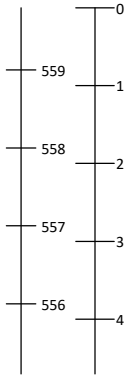
Notes: Attempt 3 of 3

Calculated Recovery
Recovery Length/Penetration Depth:
1.10 ft /1.20 ft
91.7%
See Recovered Interval Column

Sediment Core Log
MKE-20-084

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **7.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **559.8**	Penetration Depth (ft): **5.00**
Project #: **201779-01.02**	Water Depth (ft): **22.7**	Field Recovery Length (ft): **4.70**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **382198.713**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/1/2020**	Easting / Longitude: **2530838.704**	Process Date: **9/1/2020**



Sample ID	Recovered Stratigraphic Unit	Sediment Description (Samples and Descriptions are in Recovered Depths.)	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
MKE-20-084-C-00-01-200901	Sediment	0.0-1.1 ft soft, wet, grey-brown, clayey SILT, occasional sand	0	0.00/0.00
MKE-20-084-C-01-2.6-200901	Sediment	1.1-2.6 ft soft, moist, grey, clayey SILT, trace organics (wood), trace anthropogenics (plastic bag), trace shells	0.8	0.02/0.00
MKE-20-084-C-2.6-4.7-200901	Native	2.6-4.7 ft medium stiff, moist, light grey-brown, sandy CLAY, trace shell fragments	0	0.04/1.70

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Notes: Attempt 2 of 2

Calculated Recovery
Recovery Length/Penetration Depth:
4.70 ft /5.00 ft
94%
See Recovered Interval Column

Sediment Core Log
MKE-20-085

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **7.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **565.49**	Penetration Depth (ft): **2.50**
Project #: **201779-01.02**	Water Depth (ft): **16.6**	Field Recovery Length (ft): **2.50**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **382555.757**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/1/2020**	Easting / Longitude: **2530734.403**	Process Date: **9/1/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
565	0	MKE-20-085-C-00-1.2-200901	Sediment	0.0-0.5 ft very soft, wet, grey-brown, clayey SILT, occasional sand	0	0.00/0.00
	1			0.5-1.2 ft medium stiff, moist, grey, sandy SILT, trace shell fragments, intermixed with medium dense, moist, light brown, silty SAND		
564		MKE-20-085-C-1.2-2.5-200901		1.2-1.9 ft medium dense, moist, light brown, silty SAND	0	0.25/2.50
	2			1.9-2.5 ft stiff, moist, light brown, clayey SILT		
563				Native material not encountered		

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Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
2.50 ft /2.50 ft
100%
See Recovered Interval Column

Sediment Core Log
MKE-20-086

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **8.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **564.24**	Penetration Depth (ft): **2.70**
Project #: **201779-01.02**	Water Depth (ft): **18.1**	Field Recovery Length (ft): **2.70**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **382802.280**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/1/2020**	Easting / Longitude: **2530960.648**	Process Date: **9/2/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
564	0	MKE-20-086-C-00-01-200902	Sediment	0.0-1.0 ft very soft, wet, grey-brown, clayey SILT, trace sand and gravel, 3x3 inch cobble at 0.7-1 feet	0	0.00/0.00
563	1	MKE-20-086-C-01-2.7-200902		1.0-2.7 ft stiff, moist, light brown, clayey SILT	0	0.23/1.50
562	2			Native material not encountered		

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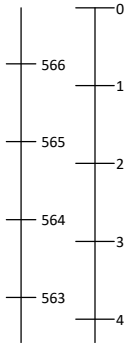
Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
2.70 ft /2.70 ft
100%
See Recovered Interval Column

Sediment Core Log
MKE-20-087

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **5.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **566.72**	Penetration Depth (ft): **4.40**
Project #: **201779-01.02**	Water Depth (ft): **15.4**	Field Recovery Length (ft): **4.30**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **383040.58**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/1/2020**	Easting / Longitude: **2530591.860**	Process Date: **9/2/2020**



Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
566	0–1	MKE-20-087-C-00-1.4-200902	Sediment	0.0-0.6 ft medium dense, moist, dark grey-brown, silty SAND, fine, trace organics (shells) 0.6-0.9 ft medium dense, moist, light grey-tan, silty SAND, fine, trace organics (shells)	0	NA/NA
565	1–2	MKE-20-087-C-1.4-03-200902	Native	0.9-1.4 ft medium dense, moist, grey, gravelly SAND, coarse, sub rounded, trace organics (shells) 1.4-4.3 ft stiff to hard, moist, light greyish brown, silty CLAY	0	0.30/1.40
564	2–3					
563	3–4	MKE-20-087-C-03-4.3-200902			0	0.29/1.20

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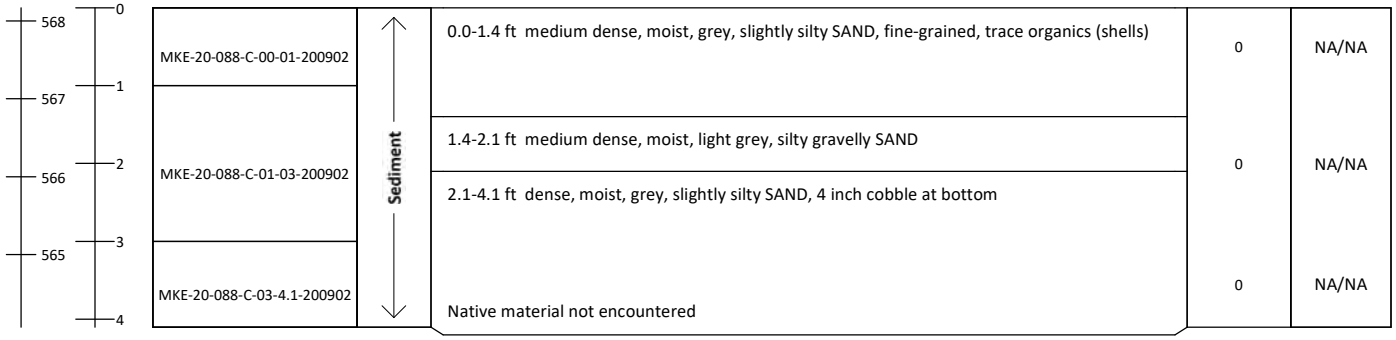
Notes: Attempt 2 of 2

Calculated Recovery
Recovery Length/Penetration Depth:
4.30 ft /4.40 ft
97.7%
See Recovered Interval Column

Sediment Core Log
MKE-20-088

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **5.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **568.17**	Penetration Depth (ft): **4.60**
Project #: **201779-01.02**	Water Depth (ft): **14.0**	Field Recovery Length (ft): **4.10**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **383590.075**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/1/2020**	Easting / Longitude: **2530767.729**	Process Date: **9/2/2020**



Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
568	0	MKE-20-088-C-00-01-200902	Sediment	0.0-1.4 ft medium dense, moist, grey, slightly silty SAND, fine-grained, trace organics (shells)	0	NA/NA
567	1					
	2	MKE-20-088-C-01-03-200902		1.4-2.1 ft medium dense, moist, light grey, silty gravelly SAND	0	NA/NA
566				2.1-4.1 ft dense, moist, grey, slightly silty SAND, 4 inch cobble at bottom		
565	3	MKE-20-088-C-03-4.1-200902			0	NA/NA
	4			Native material not encountered		

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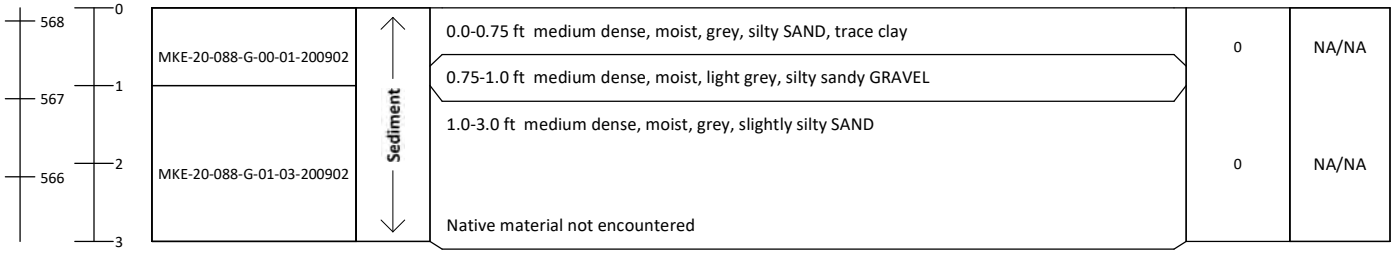
Notes: Attempt 3 of 3

Calculated Recovery
Recovery Length/Penetration Depth:
4.10 ft /4.60 ft
89.1%
See Recovered Interval Column

Sediment Core Log
MKE-20-088-G

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **6.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **568.17**	Penetration Depth (ft): **3.90**
Project #: **201779-01.02**	Water Depth (ft): **14.0**	Field Recovery Length (ft): **3.00**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **383590.075**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/1/2020**	Easting / Longitude: **2530767.729**	Process Date: **9/2/2020**



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Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
3.00 ft /3.90 ft
76.9%
See Recovered Interval Column

Sediment Core Log
MKE-20-089

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **8.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **565.4**	Penetration Depth (ft): **1.70**
Project #: **201779-01.02**	Water Depth (ft): **16.3**	Field Recovery Length (ft): **1.70**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **384250.392**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/2/2020**	Easting / Longitude: **2530998.067**	Process Date: **9/2/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
565	0	MKE-20-089-C-00-01-200902	Native	0.0-1.7 ft stiff to medium stiff, moist, light brown, silty CLAY	0	0.24/2.70
564	1	MKE-20-089-C-01-1.7-200902			0	0.30/0.60

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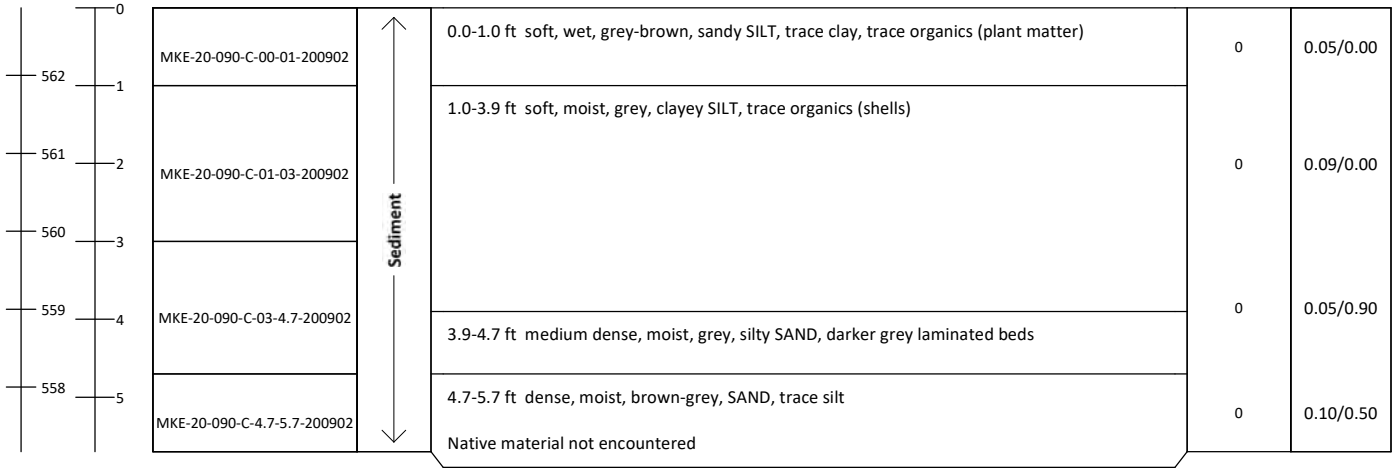
Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
1.70 ft /1.70 ft
100%
See Recovered Interval Column

Sediment Core Log
MKE-20-090

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **6.40**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **562.87**	Penetration Depth (ft): **6.00**
Project #: **201779-01.02**	Water Depth (ft): **19.0**	Field Recovery Length (ft): **5.70**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **384764.321**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/2/2020**	Easting / Longitude: **2530864.225**	Process Date: **9/2/2020**



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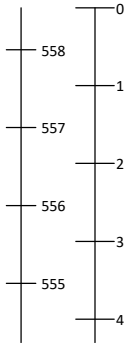
Notes: Attempt 1 of 3

Calculated Recovery
Recovery Length/Penetration Depth:
5.70 ft /6.00 ft
95%
See Recovered Interval Column

Sediment Core Log
MKE-20-091

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **8.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **558.54**	Penetration Depth (ft): **4.30**
Project #: **201779-01.02**	Water Depth (ft): **23.7**	Field Recovery Length (ft): **4.30**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **384916.373**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/2/2020**	Easting / Longitude: **2531373.512**	Process Date: **9/2/2020**



Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
		MKE-20-091-C-00-01-200903	Sediment	0.0-0.2 ft very soft, wet, grey-brown, clayey SILT 0.2-0.7 ft soft, moist, dark grey to light grey, clayey SILT	0	0.00/0.00
		MKE-20-091-C-01-3.1-200903	Sediment	0.7-3.1 ft soft, moist, dark grey, clayey SILT, trace organics (plant matter)	0	0.05/0.00
		MKE-20-091-C-3.1-4.3-200903	Native	3.1-4.3 ft medium stiff, moist, light grey-brown, slightly sandy silty CLAY, <0.1 inch coarse sand bed at top, trace gravel	0	0.28/0.50

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Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
4.30 ft /4.30 ft
100%
See Recovered Interval Column

Sediment Core Log
MKE-20-092

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **8.00**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **562.72**	Penetration Depth (ft): **2.20**
Project #: **201779-01.02**	Water Depth (ft): **19.4**	Field Recovery Length (ft): **1.90**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **383748.089**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/22/2020**	Easting / Longitude: **2531538.261**	Process Date: **9/23/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
562	0	MKE-20-092-C-00-1.2-200923	Sediment	0.0-0.2 ft very loose, wet, grey, silty SAND, trace shells 0.2-0.7 ft loose, wet, dark brown-grey, silty SAND, trace organics (plant matter), trace shells	0	0.15/0.20
561	1	MKE-20-092-C-1.2-1.9-200923	Nat	0.7-1.2 ft loose, wet, dark brown-grey, silty SAND, trace organics (plant matter), trace shells, intermixed stiff, moist, light brown silty CLAY 1.2-1.9 ft stiff, moist, light brown, silty CLAY (native)	0	0.31/0.40

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Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
1.90 ft /2.20 ft
86.4%
See Recovered Interval Column

Sediment Core Log
MKE-20-094

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **5.90**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **560.2**	Penetration Depth (ft): **2.00**
Project #: **201779-01.02**	Water Depth (ft): **22.1**	Field Recovery Length (ft): **1.8**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **382714.647**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/22/2020**	Easting / Longitude: **2531885.658**	Process Date: **9/23/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
560	0	MKE-20-094-C-00-01-200923	Sediment	0.0-0.9 ft very soft, wet, dark brown-grey, clayey SILT, moderate shells, trace organics (plant matter)	0	0.00/0.00
559	1	MKE-20-094-C-01-1.8-200923		0.9-1.0 ft loose, moist, dark grey, silty SAND, intermixed light brown silty SAND, very fine	0	NA/NA
				1.0-1.8 ft medium dense, moist, light brown, silty SAND, very fine-grained, trace gravel		
				Native material not encountered		

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Notes: Attempt 2 of 2

Calculated Recovery
Recovery Length/Penetration Depth:
1.8 ft /2.00 ft
90%
See Recovered Interval Column

Sediment Core Log
MKE-20-095

Location: **Milwaukee, WI**	Vertical Datum: **International Great Lakes Datum of 1985, feet**	Tube Length (ft): **3.90**
Project: **KK River and Milwaukee Bay Sampling**	Calculated Mudline Elevation (IGLD85 ft): **561.56**	Penetration Depth (ft): **1.20**
Project #: **201779-01.02**	Water Depth (ft): **20.6**	Field Recovery Length (ft): **1.20**
Client: **Wisconsin DNR**	Horiz. Datum: **Wisconsin State PLane, South Zone, NAD83, feet**	Method: **Pneumatic Drivecore**
Contractor: **GLEC**	Northing / Latitude: **381962.940**	Logged By: **E. Pencak/ J. van Wieringen**
Collection Date: **9/22/2020**	Easting / Longitude: **2531381.957**	Process Date: **9/23/2020**

Elevation (feet IGLD85)	Depth (feet)	Sample ID	Recovered Stratigraphic Unit	Sediment Description Samples and Descriptions are in Recovered Depths.	PID Measurement (ppmv)	Torvane (g/cm2) / Pocket Penetrometer (ton/ft2)
561	0 1	MKE-20-095-C-00-1.2-200923	Native	0.0-0.1 ft very soft, wet, light brown, silty CLAY, occasional gravel, occasional shells 0.1-1.2 ft stiff to very stiff, moist, light brown, slightly sandy silty CLAY	0	0.30/01.30

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Notes: Attempt 1 of 1

Calculated Recovery
Recovery Length/Penetration Depth:
1.20 ft /1.20 ft
100%
See Recovered Interval Column