November 2022
Buffalo River Area of Concern

Buffalo River Annual Monitoring Report 2022

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Project Number: E20287-01.02

1 Introduction

This report documents results of the inaugural 2022 annual monitoring event conducted by Anchor QEA Engineering, PLLC (Anchor QEA), on behalf of Honeywell International Inc. (Honeywell) at various project areas within the Buffalo River Area of Concern (AOC) located in the Buffalo River, Buffalo, New York. The August 2022 annual monitoring event was the first of a planned 25-year monitoring program (2022 through 2046) and included visual inspections of remedial cap and cover areas, critical structure shoreline areas, and habitat restoration areas that were components of the Buffalo River AOC Great Lakes Legacy Act (GLLA) sediment remedy and habitat restoration project (five areas), which was implemented from 2013 through 2021. The agencies and other entities involved in the GLLA project remedial planning and implementation of dredging, capping, and habitat restoration work include Honeywell, the U.S. Environmental Protection Agency's (USEPA) Great Lakes National Program Office[1], the New York State Department of Environmental Conservation (NYSDEC)[2], Buffalo Niagara Waterkeeper[3], the U.S. Army Corps of Engineers (USACE) Buffalo District, the U.S. Fish and Wildlife Service, and the City of Buffalo and their respective consultants. Honeywell was the sole non-federal sponsor for the cleanup and restoration of the Buffalo River in accordance with a project agreement dated September 2012. Additionally, Honeywell and the State of New York entered into an agreement during September 2013 for the Great Lakes National Program Office managed cleanup and restoration of the Buffalo River.

The purpose of the annual monitoring program is to provide a recurring, qualitative evaluation of the Buffalo River project area to document shoreline and adjacent upland conditions, as well as the condition of the five habitat areas. Monitoring will identify whether any observed conditions are indicative of causing impacts to installed remedial caps and covers, critical structure shoreline areas (where contaminated sediments were removed immediately adjacent to large shoreline structures), and constructed habitat restoration areas. Indications of substantial impacts would include observations such as deterioration of adjacent shoreline structural elements, installation of in-water structures within remedial control or habitat restoration footprints, and other comparable disturbances. Observed deterioration of critical structure shorelines or related environmental impacts would be reported to NYSDEC. Honeywell entered into an agreement (2021) with the City of Buffalo that would transition annual monitoring and reporting from Honeywell to the City of Buffalo after 7 years. In the event that the Buffalo River is delisted as an AOC by USEPA prior to the end of the 25-year program, annual inspections would cease.

[1] Project details available online at https://www.epa.gov/great-lakes-aocs/buffalo-river-aoc
[2] Project details available online at https://www.dec.ny.gov/chemical/54166.html
[3] Project details available online at https://bnwaterkeeper.org/buffalo-river/

1.1 Project Background

The Buffalo River AOC includes: 1) approximately 6.2 miles of the Buffalo River from the harbor to just above the confluence of the river with Cazenovia Creek; and 2) the City Ship Canal and 1.4-mile-long waterbody that adjoins Buffalo River near its confluence with Lake Erie (Figure 1). Portions of the river and City Ship Canal are designated as a federal navigation channel and are maintained by USACE at a depth of 22 feet (ft) below low water datum. The AOC is characterized by historically heavy industrial, commercial, and public development.

Historical sediment sampling that was conducted in the Buffalo River AOC identified elevated levels of various potential contaminants of concern, which were focused to the following list of four indicator chemicals: 1) total polycyclic aromatic hydrocarbon; 2) polychlorinated biphenyls (PCBs); 3) lead; and 4) mercury. The GLLA project areas generally include dredge management units (DMUs) located throughout the river and City Ship Canal (52 DMUs; Figure 2), a sediment capping area located in the City Ship Canal, and habitat restoration areas in the end of the canal, as well as four other locations within the river (five habitat restoration areas total; Figure 3).

The Buffalo River AOC GLLA project included removal of approximately 500,000 cubic yards of contaminated sediment from along both shorelines of the river. In a subset of the DMUs included in the project, remedial caps and covers were ultimately included as a component of the sediment remedy to address remaining sediment that could not be removed due to technical impracticability of removal or the presence of adjacent critical shoreline areas. In limited instances, impacted sediment materials were removed from along critical shoreline areas where large structures exist. Habitat restoration areas were incorporated into the project to mitigate for the impacts to the waterway resulting from the remedial activities. Habitat restoration efforts were generally comprised of habitat substrate improvements, installation of structural fish habitat features, and planting of aquatic vegetation. Details of the project design and subsequent implementation are provided in various documents developed for the project including the following primary documents:

- *Final Design for Sediment Remediation – Volume 1* (CH2M Hill 2013a)
- *Final Design for Habitat Restoration – Volume 2* (CH2M Hill 2013b)
- *Remedial Action Completion Report* (EQM 2016)
- *Construction Completion Report – Capping and Habitat Restoration and 2015 Additional Dredging* (Anchor QEA 2016)
- *Buffalo River Area of Concern: Dredge Management Units 16 and 17 Construction Completion Report* (Anchor QEA 2022)
- *Year 5 Verification Monitoring Results for the Buffalo River* (Ramboll and Anchor QEA 2021)
- *Buffalo River Area of Concern Final Engineering Report* (Anchor QEA 2023, anticipated)

1.2 Project Monitoring Areas

The annual monitoring program includes the Buffalo River AOC project areas where caps and covers were installed, locations where sediments were removed along critical structures, and habitat restoration areas. A summary of specific locations and features involved in the monitoring program are provided in this section.

1.2.1 Cap and Cover Areas

City Ship Canal Cap

The City Ship Canal cap was installed over an approximately 5-acre area in the most upstream portions of the City Ship Canal to isolate contaminated sediments in situ. The cap consists of a minimum 5.5 ft layer of placed sand. The cap design incorporated additional fill beyond the minimum 5.5 ft placement thickness to establish sufficient elevations to support subsequent planting and habitat restoration features. The entirety of the cap is submerged below water. Habitat restoration elements for this area are described in Section 1.2.3

DMU 8b Natural Cap

Dredging occurred in DMU 8b to remove PCB-contaminated sediments. Although post-dredge confirmation sampling indicated that post-dredge sediment PCB concentrations exceeded the remedial goal concentrations for the AOC project, significant deposition of natural materials, including up to 10 ft of sediment and organic matter, occurred within the area immediately following sampling and provided a natural cap to isolate the remaining residuals. The majority of the approximately 0.25-acre natural cap area within DMU 8b is located within the federal navigation channel, well below the maintained depth of 22 ft below low water datum.

DMU 9 and 10 Knee Wall

A submerged steel sheet pile knee wall was installed along a portion of the DMU 9 and 10 shoreline area to facilitate removal of contaminated sediments located between the base of an existing marine armor mattress system and the federal navigation channel. Installation of the knee wall included a small (approximately 5 ft wide or less) area where backfill was placed between the marine armor mattress system and the top of the knee wall. The installed knee wall is located approximately 12 ft below low water datum and is approximately 240 linear ft in length.

DMU 44e Armored Cover Area

An armored cover was installed within DMU 44e to isolate sediments that could not be removed along a shoreline bulkhead located immediately adjacent to Ohio Street, a public roadway. Backfilling was performed following dredging operations in DMU 44e to cover the remaining sediments left adjacent to the Ohio Street Shoreline bulkhead. An additional 12-inch-thick minimum layer of armor stone was placed mechanically over the backfill to provide additional protection of the

backfill from erosive forces, as well as to provide a demarcation layer to prevent future impacts from operations in the slip area. The armored cover area is approximately 0.1 acre.

DMU 16 and 17 Amended Cover Area

An amended cover containing sand and granular activated carbon was installed along the DMU 16 and 17 shoreline to isolate sediments that could not be dredged due to slope stability concerns along the deteriorated shoreline. The amended cover was placed between existing shoreline piling and the federal navigation channel. The amended cover area is approximately 0.4 acre and extends along approximately 540 ft of the shoreline.

1.2.2 Critical Structures

In general, critical structure remediation was undertaken with varying shoreline offsets, as prescribed by the design documents so as not to interfere with their current conditions. For the following areas, a 5 ft operational offset from shoreline bulkheads was included in the final design drawings issued in August 2013.

Naval Park

The area is designated as DMU 45d where sediments were removed near naval ships anchored at the Buffalo and Erie County Naval & Military Park, the adjacent commercial slip area. Removal occurred along approximately 200 linear ft of bulkheaded shoreline.

Concrete Central and Tower Adjacent to Concrete Central

This area is designated as DMU 37a and a portion of 37c, respectively, where sediments were removed near a large concrete grain silo and adjacent tower. Removal occurred along approximately 250 linear ft of bulkheaded shoreline adjacent to the structures (combined).

Cargill Grain Elevator

This area is designated as DMU 38 and 39 where sediments were removed near a large concrete grain silo. Removal occurred along approximately 600 linear ft of bulkheaded shoreline adjacent to the structure.

1.2.3 Habitat Restoration Areas

City Ship Canal

The City Ship Canal habitat restoration area coincided with the subaqueous chemical isolation capping area in the head (south) end of the canal described in Section 1.2.1. Habitat substrate for emergent vegetation (EV) and submerged aquatic vegetation (SAV) plantings was placed on the east and west banks of the cap along "benches," that were constructed above the minimum 5.5-ft-thick cap to provide suitable post-construction planting depths. Additional planting areas were

constructed in the southernmost tip of the canal. Additional habitat restoration activities in the City Ship Canal included installation of physical structures, including fish spawning beds, anchored rootwads, and porcupine cribs (a fish habitat structure).

Ohio Street Shoreline

The Ohio Street Shoreline restoration area is located upstream of DMU 44e (Deadman's Creek) along the right descending bank of the river. Planting substrate was installed in nearshore riverbed areas with existing elevations capable of supporting EV and SAV beds and subsequently planted.

Katherine Street Peninsula

The Katherine Street Peninsula habitat restoration area partially overlapped with nearshore dredging areas in DMUs 38 and 39. To restore suitable planting depths for EV and SAV beds, planting subgrade material was placed along the peninsula shoreline. Planting substrate was placed along the surface of the subgrade and subsequently planted with EV and SAV species. Additional habitat restoration activities in the Katherine Street Peninsula included installation of physical structures, such as rock vanes and anchored rootwads.

Buffalo Color Peninsula

The Buffalo Color Peninsula habitat restoration area is located along the shoreline of the Buffalo Color Area D property, where upland and in-water remediation activities have previously been conducted. Planting substrate was installed in nearshore riverbed areas with existing elevations capable of supporting EV and SAV beds. Plantings were located on the western side of the peninsula along the right descending bank of the river. Additional habitat restoration activities included installation of physical structures, including rock vanes and anchored rootwads.

Riverbend

The Riverbend habitat restoration area is located up and downstream of the South Park Bridge on the left descending bank of the river. Planting substrate was installed in nearshore riverbed areas with existing elevations capable of supporting EV and SAV beds and subsequently planted. Additional habitat restoration activities included installation of physical structures, such as rock vanes and anchored rootwads.

2 Monitoring Event Summary

2.1 Field Activities

The 2022 annual monitoring event was conducted on August 12, 2022, by staff from Anchor QEA who were involved in the design and construction of various elements of the Buffalo River AOC GLLA project. City of Buffalo staff accompanied a portion of the inspection to observe the monitoring process. Inspection activities were conducted by boat. Weather conditions included minimal cloud cover and precipitation had not occurred within 48 hours of the event, resulting in typical water clarity (approximately 1 to 2 ft deep) throughout the Buffalo River with increased clarity in some portions of the City Ship Canal (up to 8 ft deep).

Each project area was visited and visually inspected by staff during which previously developed, area-specific monitoring forms were used to record pertinent observations. Observations included, but were not limited to, signs of significant erosion, deteriorated shoreline conditions, newly installed marine structures, presence of significant debris, presence of sheen, and presence of previously installed project materials (i.e., cap and cover materials, aquatic vegetation, and habitat restoration elements).

Photographs were recorded for all project areas to accompany the information provided in the inspection forms.

2.2 Desktop Activities

For a subset of the project areas, including the DMU 8b Natural Cap and the DMUs 9 and 10 knee wall, an additional review of public dredging records available through USACE Buffalo District was performed to determine whether recent dredging activities may have occurred in the vicinity of these features.

3 Monitoring Event Results

Completed forms for the 2022 annual monitoring event are provided as Attachment 1 to this report. Representative photographs for each area are provided in Attachment 2 to this report. Overall, the inspection yielded no findings of significant impacts to the project areas relative to post-construction conditions documented in prior project completion and verification monitoring reports. A summary of notable observations is provided in Table 1.

Table 1
Monitoring Summary

Monitoring Category	Location	Significant Disturbance? (Yes/No)	Notable Observations
Cap or Cover	City Ship Canal Cap	No	None related to cap component; see Habitat Restoration Area section below for description of habitat restoration elements.
	DMU 8b Natural Cap	No	None
	DMUs 9 and 10 Knee Wall	No	City of Buffalo staff observed exposed geotextile north (upstream) of marine armor mattress system. Following inspection, it was confirmed with property owner that the geotextile was for basic erosion control purposes only and has no remedial function.
	DMU 44e Armored Cover	No	Armored cover area historically accumulates large woody debris and other materials. Debris deflectors installed as a component of the Ohio Street Shoreline Access Project appear to be working by reducing debris load to the area.
	DMUs 16 and 17 Amended Cover	No	None
Habitat Restoration Area	City Ship Canal Cap	No	During inspection, the northern portions of the planted habitat restoration area exhibited turbid water. It was inferred that this was likely a result of a freighter unloading sand recently at the adjacent terminal area. Healthy SAV bed remains, as previously documented in 2020 and Year 5 GLLA Project Monitoring.
	Ohio Street Shoreline	No	Adjacent upland and in-water area has undergone park restoration on NYSDEC property (Ohio Street Shoreline Access Project) but has not impacted restoration area. Healthy SAV bed remains, as previously documented in 2020 and Year 5 GLLA Project Monitoring.
	Katherine Street Peninsula	No	Healthy SAV bed remains as previously documented in 2020 and Year 5 GLLA Project Monitoring. Shoreline stand of cattails was observed resulting from 2017 EV planting test performed as part of GLLA Project operation, maintenance, and monitoring efforts.
	Buffalo Color	No	Healthy SAV bed remains as previously documented in 2020 and Year 5 GLLA Project Monitoring. Some invasive SAV coverage observed (Eurasian watermilfoil).

Monitoring Category	Location	Significant Disturbance? (Yes/No)	Notable Observations
Habitat Restoration Area	Riverbend	No	Sparse SAV bed remains as previously documented in 2020 and Year 5 GLLA Project Monitoring.
Critical Structures	Naval Park	No	None
	Concrete Central and Adjacent Tower	No	None
	Cargill Grain Elevator	No	None

The 2022 annual monitoring event observed conditions along both shorelines of the river. Observations indicated that the remedy components remain in place as designed, and there were no observable impacts along the shorelines. The 2022 monitoring observed the five installed habitat areas are continuing to thrive and provide functional diversity. No signs of significant disturbances were noted along the project areas inspected.

It is recommended that future monitoring events should continue to target annual inspections at a similar time of year (i.e., August or September) to control for potential seasonal differences in vegetative growth along habitat restoration areas. Annual monitoring will include similar documentation as included in Attachment 1 to this report.

4 References

Anchor QEA (Anchor QEA Engineering, PLLC), 2016. *Construction Completion Report – Buffalo River AOC Capping and Habitat Restoration and 2015 Additional Dredging*. April 2016.

Anchor QEA, 2022. *Buffalo River Area of Concern: Dredge Management Units 16 and 17 Construction Completion Report*. August 2022.

Anchor QEA, 2023 (anticipated). *Buffalo River Area of Concern Final Engineering Report*. 2023.

CH2M Hill, 2013a. *Final Design for Sediment Remediation – Volume 1*. Buffalo, New York. March 2013.

CH2M Hill, 2013b. *Final Design for Habitat Restoration – Volume 2*. Buffalo, New York. March 2013.

EQM, 2016. *Final Remedial Action Completion Report. Buffalo River AOC Project*. March 2016.

Ramboll and Anchor QEA, 2021. *Year 5 Verification Monitoring Results for the Buffalo River*. August 2021.

Figures

NOTES:
Drawing prepared from basemap files provided by CH2M Hill and developed by Anchor QEA. Aerial Imagery from Bing Maps.

HORIZONTAL DATUM: New York State Plane West, North American Datum of 1983 (NAD83) , U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum (IGLD) 1985, U.S. Feet.

LEGEND:

- Shoreline
- Navigation Channel
- 1.33 River Miles

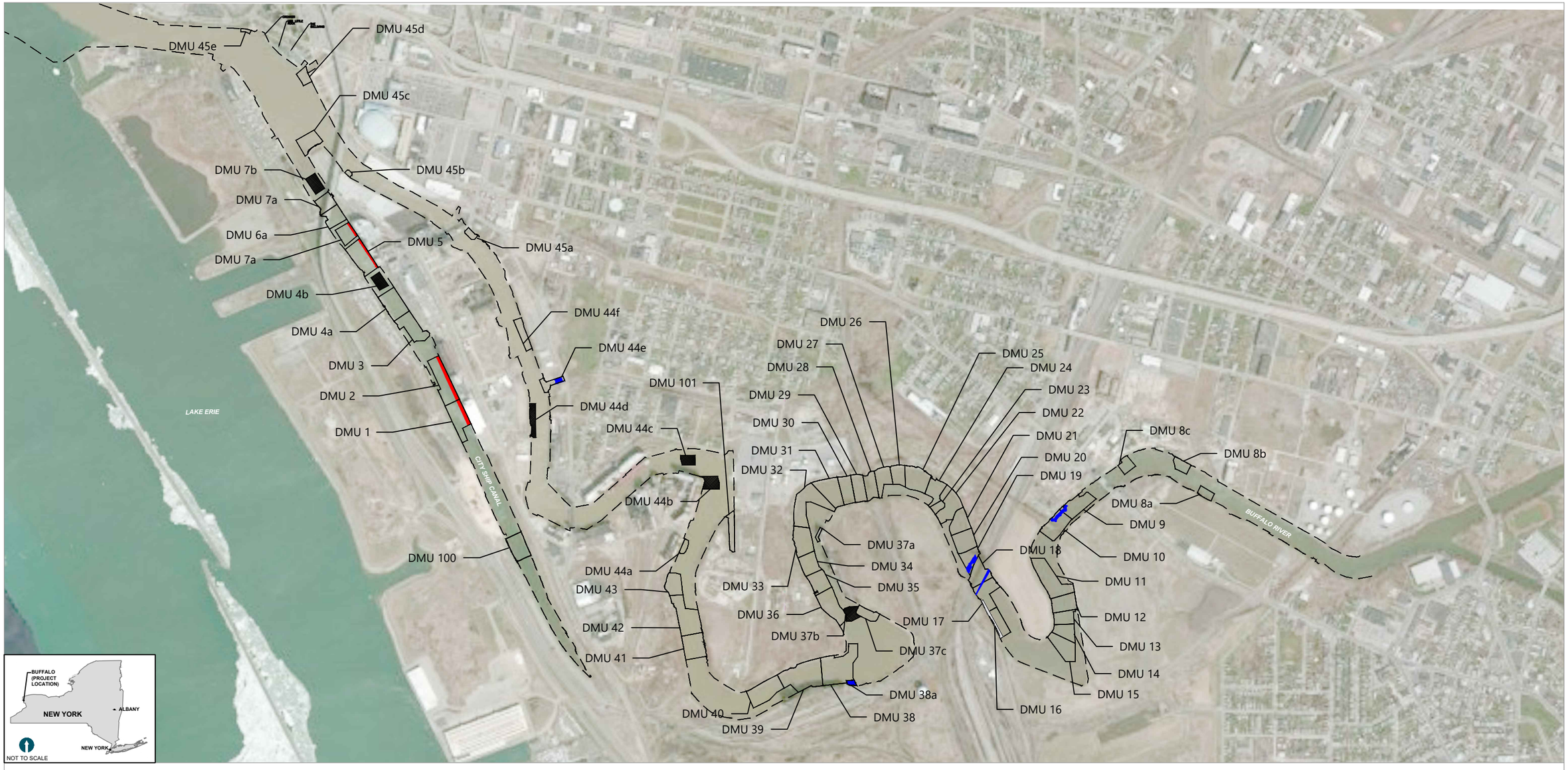
0 1250
Feet

Publish Date: 2022/11/04 1:45 PM | User: dbinkney
Filepath: K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\Figures for Buffalo River Support\0287 RP-002 Post-Dredge Conditions.dwg Figure 1

ANCHOR QEA

Figure 1
Site Overview

Buffalo River Annual Monitoring Report 2022
Buffalo River Area of Concern, Buffalo, New York



NOTES:
Drawing prepared from basemap files provided by CH2M Hill and developed by Anchor QEA. Aerial Imagery from Bing Maps.

HORIZONTAL DATUM: New York State Plane West, North American Datum of 1983 (NAD83) , U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum (IGLD) 1985, U.S. Feet.

LEGEND:

- DMU - Dredged in 2013 and 2014 Under USEPA GLNPO Contract
- DMU Not Included in Final Design
- Additional DMU Dredging in 2015 Under Honeywell Contract
- Additional DMU Dredging in 2015 Under USACE Contract
- Shoreline

0 1250 Feet

Publish Date: 2022/11/04 1:46 PM | User: dbinkney
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ANCHOR QEA

Figure 2
Dredge Management Unit (DMU) Layout

Buffalo River Annual Monitoring Report 2022
Buffalo River Area of Concern, Buffalo, New York

NOTES:
Drawing prepared from basemap files provided by CH2M Hill and developed by Anchor QEA. Aerial Imagery from Bing Maps.

HORIZONTAL DATUM: New York State Plane West, North American Datum of 1983 (NAD83) , U.S. Feet.
VERTICAL DATUM: International Great Lakes Datum (IGLD) 1985, U.S. Feet.

LEGEND:

- Shoreline
- Navigation Channel
- Capping, Backfilling or Habitat Restoration Area

0 1250
Feet

Publish Date: 2022/11/04 1:47 PM | User: dbinkney
Filepath: K:\Projects\0287-Honeywell International Inc\Buffalo River Site Strategy & Eng Sup\Figures for Buffalo River Support\0287 RP-002 Post-Dredge Conditions.dwg Figure 3

ANCHOR QEA

Figure 3
Capping, Backfilling, Critical Structure, and Habitat Restoration Area Layout

Buffalo River Annual Monitoring Report 2022
Buffalo River Area of Concern, Buffalo, New York

Attachment 1
Monitoring Forms

City Ship Canal Cap and Habitat Restoration Area

Description of Project Area

1. Sand cover/cap (5.5 ft thick) was placed to isolate contaminated sediments.
2. Habitat restoration elements including rootwad logs, porcupine crib fish attraction structures, and gravel fish spawning beds were installed
3. Submerged Aquatic Vegetation (SAV) was planted below the water line
4. Emergent Vegetation (EV) was planted at the head of the Ship Canal (south) and around perimeter

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 to 8 FT (See notes)

Site Feature Conditions

Submerged Aquatic Vegetation (SAV) present?	Yes
Comments on presence/absence of vegetation growing beneath water surface:	Vallisneria americana, Potamogetan natans, Potamogetan crispus
Emergent Vegetation (EV) present?	Yes
Comments on presence/absence of vegetation emerging from water surface (e.g., lilies, grasses, fleshy leaved plants):	Nymphaea odorata
Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	Though no erosion visibly turbid water was present throughout the northernmost ~1/3 of cap area due to recent presence of Great Lakes freighter unloading and Sand Corps facility.
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	N/A
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Presence of invasive species?	Yes
Comments (estimate % of area dominated by invasives, invasive species present)	Eurasian watermilfoil (<5%)
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	Yes
Photo IDs (file names), locations, and notes	See photograph log and photograph database
Other Comments:	No indications of significant disturbance

Ohio Street Shoreline Habitat Restoration Area

Description of Project Area

1. Submerged Aquatic Vegetation (SAV) was planted below the water line
2. Emergent Vegetation (EV) was planted along the shoreline

General Inspection Information

Date of Annual Visual Inspection:	44785
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Submerged Aquatic Vegetation (SAV) present?	Yes
Comments on presence/absence of vegetation growing beneath water surface:	Vallisneria americana, Potamogetan natans, Potamogetan crispus
Emergent Vegetation (EV) present?	No
Comments on presence/absence of vegetation emerging from water surface (e.g., lilies, grasses, fleshy leaved plants):	N/A
Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	N/A
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	N/A
Installation of shoreline or nearshore structures?	Yes
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	Installation of adjacent fishing pier as a component of Ohio Street Boat Launch project. This BNW project included augmentation of SAV along the shoreline and benefited adjacent habitat area. SAV bed did not appear to be disturbed by construction activities.
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Presence of invasive species?	No
Comments (estimate % of area dominated by invasives, invasive species present)	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	Yes
Photo IDs (file names), locations, and notes	See photograph log and photograph database
Other Comments:	No indications of significant disturbance

Katherine Street Peninsula Habitat Restoration Area

Description of Project Area

1. Habitat restoration elements including rootwad logs and rock vanes were installed
3. Submerged Aquatic Vegetation (SAV) was planted below the water line
4. Emergent Vegetation (EV) was planted along the shoreline

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Submerged Aquatic Vegetation (SAV) present?	Yes
Comments on presence/absence of vegetation growing beneath water surface:	Vallisneria americana, Potamogetan natans, Potamogetan crispus, Ceratophyllum demersum
Emergent Vegetation (EV) present?	Yes
Comments on presence/absence of vegetation emerging from water surface (e.g., lilies, grasses, fleshy leaved plants):	Nymphaea odorata, small batch of Cattails planted as part of 2017 OM&M effort
Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	N/A
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Presence of invasive species?	No
Comments (estimate % of area dominated by invasives, invasive species present)	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	Yes
Photo IDs (file names), locations, and notes	See photograph log and photograph database
Other Comments:	No indications of significant disturbance

Buffalo Color Habitat Restoration Area

Description of Project Area

1. Habitat restoration elements including rootwad logs and rock vanes were installed
3. Submerged Aquatic Vegetation (SAV) was planted below the water line
4. Emergent Vegetation (EV) was planted along the shoreline

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Submerged Aquatic Vegetation (SAV) present?	Yes
Comments on presence/absence of vegetation growing beneath water surface:	*Vallisneria americana, Potamogetan natans, Potamogetan crispus*
Emergent Vegetation (EV) present?	Yes
Comments on presence/absence of vegetation emerging from water surface (e.g., lilies, grasses, fleshy leaved plants):	Sagittaria latifolia
Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	Car tire observed
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	Submerged/immovable by hand
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Presence of invasive species?	Yes
Comments (estimate % of area dominated by invasives, invasive species present)	Eurasion Watermilfoil (10%)
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	Yes
Photo IDs (file names), locations, and notes	See photograph log and photograph database
Other Comments:	No indications of significant disturbance

Riverbend Habitat Restoration Area

Description of Project Area

1. Habitat restoration elements including rootwad logs and rock vanes were installed
3. Submerged Aquatic Vegetation (SAV) was planted below the water line
4. Emergent Vegetation (EV) was planted along the shoreline

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Submerged Aquatic Vegetation (SAV) present?	Yes
Comments on presence/absence of vegetation growing beneath water surface:	Limited patches of Vallisneria americana
Emergent Vegetation (EV) present?	No
Comments on presence/absence of vegetation emerging from water surface (e.g., lilies, grasses, fleshy leaved plants):	N/A
Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	N/A
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Presence of invasive species?	No
Comments (estimate % of area dominated by invasives, invasive species present)	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

DMU 8b Natural Cap

Description of Project Area

1. DMU 8b was dredged to remove PCB contaminated sediments. Natural deposition occurred within the DMU following dredging, isolating dredge residuals.

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Has Navigational Dredging occurred in or near the DMU?	No
Comments on confirmation of recent dredging activities with USACE personnel (See References and Supporting Information Sheet)	Reviewed USACE website - no dredging since Unity Island BU project dredging
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	N/A
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

DMU 9 and 10 Knee Wall

Description of Project Area

1. A submerged steel sheet pile knee wall was installed along DMU 9 and 10 shoreline to facilitate removal of sediments.
2. Backfill was placed in narrow (approximately 5 feet wide) area between knee wall and marine armor mattress

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	Small area of exposed geotextile upstream of knee wall area was observed by accompanying City of Buffalo staff. Was confirmed with property owner not to be a component of remedial measure.
Has Navigational Dredging occurred in or near the DMU?	No
Comments on confirmation of recent dredging activities with USACE personnel (See References and Supporting Information Sheet)	No recent dredging - confirmed via USACE website
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	Small woody debris on shoreline
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	Small/insignificant
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

DMU 44e Armored Cover Area

Description of Project Area

1. Backfill was placed on a 4 Horizontal : 1 Vertical slope at the head end of the inlet from wooden bulkhead along Ohio Street to approximately 100 ft from the bulkhead towards the Buffalo River.
2. Armor stone was placed over the backfill

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Are large (>100 square foot) accumulations of floating debris present?	Yes
Comments (Natural materials, anthropogenic materials, photo ID):	Woody debris
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	Too large for removal and similar in size to typically accumulated debris. Debris deflectors installted at the mouth of Deadman's Creek as part of Ohio Street Boat Launch project appear to be descreasing accumulation of woody debris.
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

DMU 16 and 17 Cover

Description of Project Area

1. A portion of DMU 16 was dredged to remove surficial tPAH contaminated sediments.
2. A Cover was installed on the riverbank adjacent to DMU 17 and 16.

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Has Navigational Dredging occurred in or near the DMU?	No
Comments on confirmation of recent dredging activities with USACE personnel (See References and Supporting Information Sheet)	No recent dredging - confirmed via USACE website
Are large (>100 square foot) accumulations of floating debris present?	No
Comments (Natural materials, anthropogenic materials, photo ID):	N/A
Was accumulated debris removed?	No
Comments (date removed; if not removed, reason not removed):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

Naval Park Critical Structure Area

Description of Project Area

1. Critical structures were present along shoreline areas of DMU 45d where dredging occurred.

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Has Navigational Dredging occurred in or near the Critical Structure?	No
Comments on confirmation of recent dredging activities with USACE personnel (See References and Supporting Information Sheet)	No recent dredging - confirmed via USACE website
Significant modifications to upland conditions along the shoreline or change in site use?	No
Comments on presence of new buildings, excavation, modification to site use, redevelopment, etc.):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

Concrete Central & Tower Adjacent to Concrete Central

Description of Project Area

1. Critical structures were present along shoreline areas of DMU 37a and 37c where dredging occurred.

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Has Navigational Dredging occurred in or near the Critical Structure?	No
Comments on confirmation of recent dredging activities with USACE personnel (See References and Supporting Information Sheet)	No recent dredging - confirmed via USACE website
Significant modifications to upland conditions along the shoreline or change in site use?	No
Comments on presence of new buildings, excavation, modification to site use, redevelopment, etc.):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

Cargill Grain Elevator

Description of Project Area

1. Critical structures were present along shoreline areas of DMU 38 and 39 where dredging occurred.

General Inspection Information

Date of Annual Visual Inspection:	8/12/2022
Staff Inspecting (Last name, First Name):	Bagnull, Steven; Murphy, Brian
Affiliation:	Anchor QEA
Current Weather Conditions:	Sunny, 70's
Precipitation in last 48 Hours?):	No
Water Clarity (Estimated Depth of Visibility):	2 FT

Site Feature Conditions

Signs of significant erosion?	No
Comments (Erosion along shoreline? Note what/where, photo ID):	N/A
Has Navigational Dredging occurred in or near the Critical Structure?	No
Comments on confirmation of recent dredging activities with USACE personnel (See References and Supporting Information Sheet)	No recent dredging - confirmed via USACE website
Significant modifications to upland conditions along the shoreline or change in site use?	No
Comments on presence of new buildings, excavation, modification to site use, redevelopment, etc.):	N/A
Installation of shoreline or nearshore structures?	No
Comments on Installation of shoreline or nearshore structures (e.g., piling, piers, armoring, fill placement, sheeting, mooring, boat ramp, etc.):	N/A
Presence of petroleum sheen on water surface?	No
Comments on color and size (square feet) of sheen area. Contact USCG if source is identifiable.	N/A
Photographs from set points?	Yes
Photo IDs (file names) and locations. If set points for reference photos have not been identified, identify them and provide coordinates for future monitoring	See photograph log and photograph database
Other Photographs?	No
Photo IDs (file names), locations, and notes	N/A
Other Comments:	No indications of significant disturbance

Attachment 2
Photograph Log

Photograph 1
City Ship Canal Cap Area

Photograph 2
DMU 8b Natural Cap Area

Photograph 3
DMUs 9 and 10 Knee Wall Area

Photograph 4
DMU 44e Armored Cover Area

Photograph 5
DMUs 16 and 17 Amended Cover Area

Photograph 6
City Ship Canal Habitat Restoration Area—Turbid Water Area

Photograph 7
City Ship Canal Habitat Restoration Area—Clear Water Area

Photograph 8
Ohio Street Shoreline Habitat Restoration Area

Photograph 9
Katherine Street Peninsula Habitat Restoration Area

Photograph 10
Buffalo Color Habitat Restoration Area

Filepath: https://anchorqea-my.sharepoint.com/personal/dscarcella_anchorqea_com/Documents/Desktop/QC Comments/Buffalo River/Attachment 2_Photograph Log.docx

Photograph 11
Riverbend Habitat Restoration Area

Photograph 12
Naval Park Critical Structure Area (DMU 45d Vicinity)

Photograph 13
Concrete Central Critical Structure Area (DMU 37a Vicinity)

Photograph 14
Tower Adjacent to Concrete Central Critical Structure Area (DMU 37d Vicinity)

Photograph 15
Cargill Grain Elevator Critical Structure Area (DMUs 38 and 39 Vicinity)

Filepath: https://anchorqea-my.sharepoint.com/personal/dscarcella_anchorqea_com/Documents/Desktop/QC Comments/Buffalo River/Attachment 2_Photograph Log.docx