NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

UPPER MISSISSIPPI RIVER
MOORING FACILITIES

POOL 10
CLAYTON COUNTY, IOWA

APPENDIX B

CLEAN WATER ACT COMPLIANCE

1. CLEAN WATER ACT COMPLIANCE INTRODUCTION

The US Army Corps of Engineers St. Paul Districts (USACE), is required to comply with the Clean Water Act (CWA) Sections 401 and 404 for the Navigation and Ecosystem Sustainability Program's *Upper Mississippi River Mooring Facilities* (Project). This appendix details the Corps justifications for why this Project meets the conditions and requirements of CWA Nationwide Permit (NWP) 25 – Structural Discharges.

2. PROJECT DESCRIPTION

General Description. The purpose of the Project is to construct mooring facilities above Lock 10 of Upper Mississippi River (UMR) (Figure 1). The Project seeks to reduce commercial traffic delays by constructing mooring facilities for to tie off to while awaiting passage through the associated locks. Under present conditions, towboats must move in close to shore and ground their barges or maintain engine power within these pools to hold position. With a mooring facility at the proposed locations, towboats could tie off to the structures and minimize sediment re-suspension by allowing their engines to run at idling speed or off. The Project seeks to provide time saving infrastructure for navigation while also prevent damages caused by erosion, prop wash, and groundings of barges waiting in other areas within these pools.

General Description of Excavated and Fill Material. The mooring cell will be 1230 square feet in size and have scour protection around the cell of 16,168 square feet (total area 17,398 square feet). Steel, concrete, and aggregate will be used to construct each mooring cell.

For the mooring cell, construction will include mechanical excavation of 350 cy of river sediment (primarily sand), to facilitate proper placements of the mooring facility features. The area of excavation should be less than 5,000 square feet.

The fill for the proposed action will include steel piling and pipe for the mooring cell, 905 cy of concrete fill within the mooring cell, 2700 cy of rip rap within the cell, and 5400 cy of rip rap at the base and outside of the mooring cell.

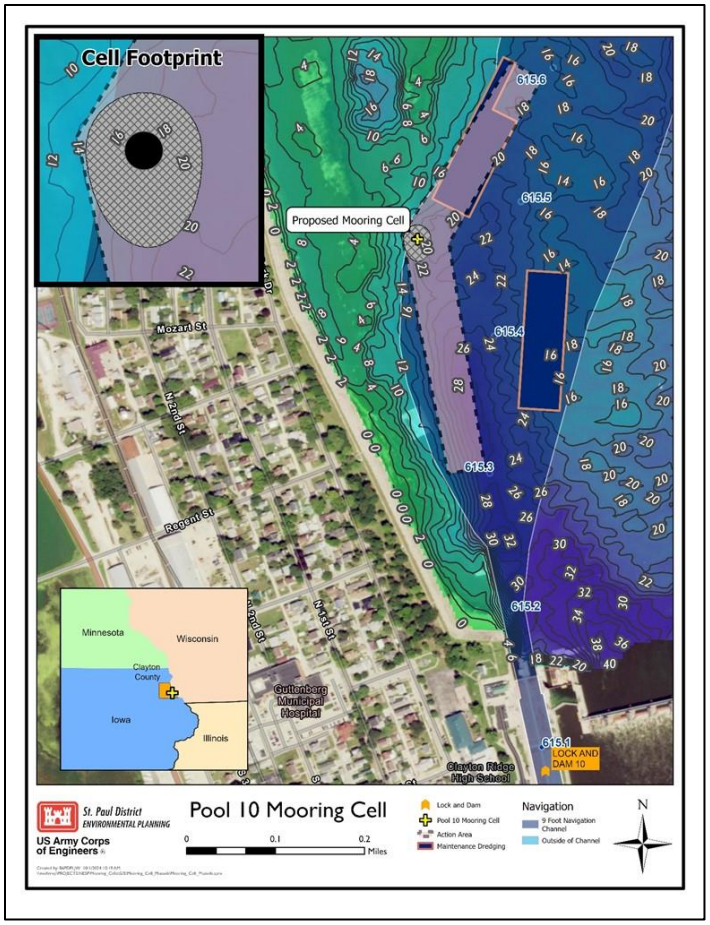


Figure 1. Locations of Proposed Mooring Facilities at Lock 10

3. AUTHORITY

In the 1880s, Congress directed the Corps to prevent dumping and filling in the nation's harbors, a program that was vigorously enforced by the engineers. In the Rivers and Harbors Act of 1899, Congress gave the Corps the authority to regulate most kinds of obstructions to navigation, including hazards resulting from effluents (under the so-called Refuse Act, but actually Section 13 of the 1899 legislation).

Within its current regulatory program, the Corps has authority over work on structures in navigable waterways under Section 10 of the Rivers and Harbors Act of 1899 and over the discharge of dredged or fill material under Section 404 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500). This latter requirement applies to wetlands and other valuable aquatic areas throughout the United States. The Corps' current regulatory mission is a natural product of historical evolution, for the Corps has been exercising regulatory responsibilities for over a hundred years.

On December 27, 2021, the Corps published in the Federal Register (Vol. 86, No. 3245), the Final Rule for the Nationwide Permits Program under the Rivers and Harbors Act of 1899; the Clean Water Act; and the Marine Protection, Research and Sanctuaries Act. These rules became effective on February 25, 2022. The PDT used this approved version of the NWP language, terms, and conditions. The NWP 25 is included as an attachment to this analysis.

Engineer Regulation 1105-2-100, C-6.i. dated April 22, 2000, titled, Planning Guidance Notebook states,

> *"Nationwide and regional permits fall under the category of general permits. A general permit is issued subject to the Section 404(b)(1) Guidelines and to any conditional standards pursuant to Section 404(e) of the Clean Water Act. The conditions of a general permit shall be used in lieu of this regulation for those Federal activities which the District Commander determines to be applicable. However, the use of a general permit shall not substitute for or*

eliminate the need for the preparation of an appropriate NEPA document, i.e., EIS or EA FONSI."

Consistent with this policy, the Corps evaluated the Project's impacts based on NWP 25 terms and conditions.

4. THE PERMITING PROCESS

The Corps requires permits for building or developing in, on, or over wetlands and waters. The Corps regulatory program permit evaluation process results in permit decisions balancing the need for proposed development with protection of the nation's aquatic environment.

The level of the Corps evaluation is commensurate with the level of the environmental impacts and the aquatic functions and values involved in the particular area being impacted. Authorization can range from minor permits such as Nationwide and Programmatic and Regional General Permits to Individual Permits. Impacts to higher ecological value areas will be subject to a much more detailed evaluation and a strong focus on avoidance of impacts to the aquatic environment. In the case of this Project, the PDT's CWA compliance procedures include:

- Demonstrating why NWP 25 would be the appropriate level of compliance. This appendix outlines this information the District's Regulatory office reviewed to make their final concurrence/nonoccurrence determination.

5. NATIONWIDE PERMIT COMPLIANCE DOCUMENTATION

To use a NWP, the Project must comply with the General NWP Conditions for NWPs (Table B-1) as well as the Regional and Section 401 Conditions for the State of Iowa.

For the full language of NWP permit conditions and NWP 25 conditions, as well as the State of Iowa Section 401 State Water Quality Certification for NWP 25, refer to the St. Paul District's Regulatory Division website for Nationwide Permits and 401 Water Quality Certification conditions (https://www.mvp.usace.army.mil/Missions/Regulatory/).

The following tables and discussion show the Corps compliance responses to the general permitting conditions for NWP as well as the Regional and Section 401 conditions for Iowa.

Table B-1. General NWP Conditions and Compliance Responses

#	General NWP Condition	Compliance Response
1	Navigation	No negative navigation impacts expected. The Project would improve barge operation, safety, or tow handling.
2	Aquatic Life Movements	No measurable impacts to aquatic life movements expected.
3	Spawning Areas	No measurable impacts to spawning areas
4	Migratory Bird Breeding Areas	No measurable impacts to migratory bird breeding areas.
5	Shellfish Beds	Full compliance is expected following Endangered Species Act coordination with USFWS
6	Suitable Material	Water control features would require standard construction materials.
7	Water Supply Intakes	No public water supply intakes present in planning/impact area
8	Adverse Effects from Impoundments	No applicable
9	Management of Water Flows	Project features would not measurably impact fluctuating river levels.
10	Fills Within 100-Year Floodplains	This Project would comply with applicable FEMA approved floodplain management requirements.
11	Equipment	Use of heavy equipment would be done in dry conditions and would not impact the water column clarity or water quality standards
12	Soil Erosion and Sediment Controls	The Project would require standard construction guidelines to avoid erosion and sediment resuspension.
13	Removal of Temporary Fills	Not Applicable
14	Proper Maintenance	The District would ensure mooring facilities are properly maintained.
15	Single and Complete Project	Each mooring facility is a single and complete project
16	Wild and Scenic Rivers	Not Applicable
17	Tribal Rights	Not Applicable
18	Endangered Species	In Progress
19	Migratory Birds and Bald and Golden Eagles	No eagle nesting or roosting areas would be impacted or disturbed from this action
20	Historic Properties	In Progress
21	Discovery of Previously Unknown Remains and Artifacts	During construction, if any artifacts or human remains are discovered, the District must be immediately notified, and construction activities that may affect any remains and artifacts should be avoided, to the maximum extent practicable, until the required coordination has been completed.
22	Designated Critical Resource Waters	This Project would comply with the conditions of Designated Critical Resource Waters
23	Mitigation	This Project would not require wetland mitigation.
24	Safety and Impoundments Structures	Not Applicable
25	Water Quality	This Project would comply with the applicable states' water quality standards
26	Coastal Zone Management	Not Applicable
27	Regional and Case-By-Case Conditions	Not Applicable
28	Use of Multiple Nationwide Permits	The Project PDT requests only NWP 25.
29	Transfer of NWP Verifications	Not Applicable
30	Compliance Certification	The District would comply with submitting the compliance certification upon receipt of the NWP.
31	Activities Affecting Structure or Works	Not Applicable
32	Pre-Construction Notification	Full compliance expected. This project does not affect navigable waters of the United States.

6. IOWA REGIONAL AND SECTION 401 CONDITIONS COMPLIANCE

The Iowa Department of Natural Resources (IA DNR) promulgated authority to issue CWA Section 401 Water Quality Certification certifying the Project's discharge will comply with Iowa's water quality standards on a case-by-case basis. However, for certain NWPs, the IA DNR issued 401 Water Quality Certification for all projects meeting the conditions and limits of the NWPs. Each project must also comply with the IA DNR's conditions specific to each NWP.

Table B-2. St. Paul District NWP Regional Conditions for Iowa

#	IA Regional Conditions	Compliance Response
1	Side slopes of a newly constructed channel will be no steeper than 2:1 and planted to permanent, perennial, native vegetation if not armored.	Not applicable. No new channels would be constructed.
2	For projects that impact an Outstanding National Resource Water, Outstanding Iowa Water, fens, bogs, seeps, or sedge meadows, a Pre-Construction Notice in accordance with General Condition No. 32 and an Individual Section 401 Water Quality Certification will be required.	Not applicable. The Project does not affect Outstanding National Resource Water, Outstanding Iowa Water, fens, bogs, seeps, or sedge meadows
3	Any bank stabilization activity involving a method that protrudes from the bank contour, such as jetties, stream barbs and/or weirs, will require a Pre-Construction Notice in accordance with General Condition No. 32.	Not applicable. This project does not include permanent structure that protrude from the bank contour, such as jetties, stream barbs and/or weirs
4	Beyond what is described in General Condition #6, suitable fill material shall consist of clean materials, free from debris, trash, and other deleterious materials. If broken concrete is used as riprap, all reinforcing rods must be cut flush with the surface of the concrete, and individual pieces of concrete shall be appropriately graded and not exceed 3 feet in any dimension. Asphalt, car bodies, and broken concrete containing asphalt, and liquid concrete are specifically excluded	All materials used will be free from debris, trash, and other deleterious materials
5	No non-native, invasive or other plant species included on the Corps "Excluded Plant List" shall be planted for re-vegetation or stabilization purposes, with the exception of any species that hold particular cultural or traditional significance to the Meskwaki Nation (the Sac and Fox Tribe of the Mississippi in Iowa). The plant list can be found on the Corps website at: http://www.mvr.usace.army.mil/Missions/Regulatory.aspx. To prevent the spread of non-native and/or invasive plant species, the permittee shall ensure that equipment to be utilized in Waters of the United States is cleaned before arriving on site. Wash water shall not be discharged into any wetland, waterway, or any other surface water conveyances.	Not applicable. No plantings are planned for stabilization.

Table B-3. Iowa Section 401 Water Quality Certification Conditions and Compliance Responses

#	IA DNR Section 401 Water Quality Certification Conditions	Compliance Response
1	During construction and upon completion of the project, actions must be taken to prevent pollution affecting public health, fish, shellfish, wildlife, and recreation due to turbidity, pH, nutrients, suspended solids, floating debris, visible oil and grease, or other pollutants entering a water of the state. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2)	All appropriate actions will be taken to prevent any pollution affecting public health, wildlife health, and/or water quality.
2	Equipment used in waters of the state shall be cleaned of all hazardous materials, pesticides, fuels, lubricants, oils, hydraulic fluids, or other construction-related, potentially hazardous substances before arriving on site. Wash water shall not be discharged into a water of the state. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2)	All equipment used in the water will be clean and clear of the listed hazardous materials and/or aquatic vegetation.
3	All cleared vegetative material shall be properly managed in such a manner that it cannot enter a water of the state and cause a violation of water quality standards. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2).	All vegetation/tree removal debris will be disposed of offsite.
4	All construction debris shall be properly managed in such a manner that it cannot enter a water of the state. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2)	All construction debris will be disposed of in an EPA approved landfill.
5	Erosion shall be managed so that sediment is not discharged to a water of the state in a manner that causes a violation of water quality standards. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2)	Work limits and BMPs will be required to prevent erosion.
6	Riprap and temporary crossings shall consist of clean material free of coatings of potentially hazardous substances. No asphalt or petroleum-based material shall be used as or included in riprap material placed in any water of the state or within the high-water table. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2)	Riprap used would be IA DOT Class C Riprap (or Federally Acceptable Equivalent). Material will be free of potentially hazardous coatings/substances.
7	Stockpiled dredged materials on the shore shall be managed so that sediment is not discharged to a water of the state in a manner that causes a violation of water quality standards. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2)	Any stocked piled dredged material with be appropriately managed as to not violate water quality standards.
8	Hydraulically dredged material shall be managed to ensure the return water meets water quality standards found at 567 IAC 61.3(2)	Not applicable. This project does not include any hydraulic dredging.

10. CONCLUSION

The Corps concludes this Project meets the conditions of Section 404 of the Clean Water Act by an existing Department of Army NWP for Structural Discharge (NWP 25), as described in the December 27, 2021, Federal Register, Reissuance of Nationwide Permits; Notice (86 FR 245). Section 401 water quality certification has been issued for Nationwide Permit (NWP) 25 – Structural Discharge by the MNPCA, IA DNR, IL DNR, and MDC and therefore would apply to the proposed action.

The Corps realize NWP 25 may be modified, reissued, or revoked prior to project construction. The Corps will remain informed of changes to the NWPs. If construction activities are not completed prior to 12 months from the date of the modifications or revocation of the NWP, the Corps will reevaluate the Project's 404 compliance status and will coordinate the Project with the appropriate Corps Regulatory Branches. The Project will be in full compliance with the current CWA regulations prior to any construction and activities.

October 12, 2021

Mr. Ward Lenz
Rock Island District Corps of Engineers
Clock Tower Building
PO Box 2004
Rock Island, IL 61204-2004

Dear Mr. Lenz:

The Iowa Department of Natural Resources (DNR) issued a Section 401 Water Quality Certification (certification) for reissued and new Nationwide Permits (NWPs) on December 14, 2020. On August 18, 2021, the Rock Island District of the U.S. Army Corps of Engineers (Corps) sent a letter allowing for revised certification of the 41 NWPs that were not finalized by the Corps on March 15, 2021.

In accordance with Section 401 of the Federal Water Pollution Control Act (40 C.F.R. Part 121, effective September 11, 2020), the DNR has reviewed the proposed modifications and additions to the NWPs and Iowa Regional Conditions and, by this letter, is issuing certification for NWPs numbered 3, 4, 5, 6, 7, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 25, 27, 30, 31, 32, 33, 34, 36, 37, 38, 41, 45, 46, 49, 53, 54, and 59 with the following conditions:

(1) During construction and upon completion of the project, actions must be taken to prevent pollution affecting public health, fish, shellfish, wildlife, and recreation due to turbidity, pH, nutrients, suspended solids, floating debris, visible oil and grease, or other pollutants entering a water of the state. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2);

(2) Equipment used in waters of the state shall be cleaned of all hazardous materials, pesticides, fuels, lubricants, oils, hydraulic fluids, or other construction-related, potentially hazardous substances before arriving on site. Wash water shall not be discharged into a water of the state. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2);

(3) All cleared vegetative material shall be properly managed in such a manner that it cannot enter a water of the state and cause a violation of water quality standards. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2);

(4) All construction debris shall be properly managed in such a manner that it cannot enter a water of the state. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2);

(5) Erosion shall be managed so that sediment is not discharged to a water of the state in a manner that causes a violation of water quality standards. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2);

(6) Riprap and temporary crossings shall consist of clean material free of coatings of potentially hazardous substances. No asphalt or petroleum-based material shall be used as or included in riprap material placed in any water of the state or within the high-water table. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2);

(7) Stockpiled dredged materials on the shore shall be managed so that sediment is not discharged to a water of the state in a manner that causes a violation of water quality standards. This condition will ensure permittees comply with Iowa's narrative water quality standards found at 567 IAC 61.3(2); and

(8) Hydraulically dredged material shall be managed to ensure the return water meets water quality standards found at 567 IAC 61.3(2).

Nationwide permits numbered 1, 2, 8, 9, 10, 11, 24, 28, and 35 do not require certification because they would authorize activities which could not reasonably be expected to result in a discharge into waters of the United States.

The DNR has determined that the discharges from the proposed projects to be authorized using the nationwide permits will comply with water quality requirements. If you have any questions about the certification or any conditions contained therein, please contact me at [redacted] or call [redacted].

Sincerely,

Christine Schwake

Digitally signed by Christine Schwake
Date: 2021.10.12 08:20:41 -05'00'

Christine Schwake
Environmental Specialist

cc: Mr. John Moeschen, U.S. Army Corps of Engineers, Nebraska Regulatory Field Office, 8901 S. 154th ST, STE 1, Omaha, NE 68138-3635 (email)

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

UPPER MISSISSIPPI RIVER
MOORING FACILITIES

POOL 10
CLAYTON COUNTY, IOWA

APPENDIX C

PROJECT PLANS

US Army Corps of Engineers®

ST. PAUL DISTRICT

Stantec

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

SOLICITATION NO.: XXXXXXXXXX

CONTRACT NO.:

ISSUE DATE: MAY 2024

Stantec

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

XXXXXX X. XXXXXXXXX XX/XX/XXXX

LICENSE NUMBER:
MY LICENSE RENEWAL DATE IS
PAGES OR SHEETS COVERED BY THIS SEAL:
G-001 THRU X-XXX

I HEREBY CERTIFY THAT REVISION 0 TO THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

XXXXXX X. XXXXXXXXX XX/XX/XXXX

LICENSE NUMBER:
MY LICENSE RENEWAL DATE IS
PAGES OR SHEETS COVERED BY THIS SEAL:
S-001 THRU X-XXX

THIS PROJECT WAS DESIGNED BY STANTEC FOR THE ST. PAUL DISTRICT CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS WITHIN THE ST. PAUL DISTRICT APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152. SIGNATURES INDICATE OFFICIAL RECOMMENDATION OF ALL DRAWINGS IN THIS SET.

APPROVAL RECOMMENDED BY:

CHIEF, DESIGN BRANCH DATE

CHIEF, HYDROLOGY & HYDRAULICS BRANCH DATE

CHIEF, GEOTECHNICAL BRANCH DATE

CHIEF, TECHNICAL SERVICES BRANCH DATE

CHIEF, ENGINEERING & CONSTRUCTION DIVISION DATE

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

COVER SHEET

SHEET ID
SITE 10
G-001

PRE-FINAL SUBMITTAL

ABBREVIATIONS

L	ANGLE
A/C	AIR CONDITIONING
A/C UNIT	AIR CONDITIONING UNIT
AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ACC	ACCESSIBLE
ACI	AMERICAN CONCRETE INSTITUTE
ACR	ACRYLIC PLASTIC
ACS DR	ACCESS DOOR
ACS PNL	ACCESS PANEL
ACSR	ALUMINUM CABLE STEEL REINFORCED
ACST	ACOUSTIC
ACT	ACOUSTICAL CEILING TILE
ADDM	ADDENDUM
ADH	ADHESIVE
ADJ	ADJACENT, ADJOINING, ADJUSTABLE
ADO	AUTOMATIC DOOR OPERATOR
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AHR	ANCHOR
AHU	AIR HANDLING UNIT
AI	AREA INLET
AIC	AMPERE INTERRUPTING CAPACITY
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
A.L.	ACTIVE LEAF
ALT	ALTERNATE
ALUM	ALUMINUM
AMB	AMBIENT
AMP	AMPERE
ANOD	ANODIZE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPD	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECT
ARI	AMERICAN REFRIGERATION INSTITUTE
ASB	ASBESTOS
ASC	ABOVE SUSPENDED CEILING
ASPH	ASPHALT
ATC	ACOUSTICAL TILE CEILING
AUTO	AUTOMATIC
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
AWT	ACOUSTICAL WALL TREATMENT
BB	BULLETIN BOARD
BC	BOOKCASE
BD	BOARD
BDRY	BOUNDARY
BEJ	BRICK EXPANSION JOINT
BEV	BEVEL
BITUM	BITUMINOUS
BJT	BED JOINT
BL	BUILDING LINE
BLDG	BUILDING
BLW	BELOW
BM	BENCHMARK
BO	BOTTOM OF
BOT	BOTTOM
BP	BACK PLASTER(ED)
BRCG	BRACING
BRDG	BRIDGING
BRG	BEARING
BRG PL	BEARING PLATE
BRK	BRICK
BRKT	BRACKET
BRZ	BRONZE
BS	BOTH SIDES
BSMT	BASEMENT
Btu	BRITISH THERMAL UNIT
BtuH	BTU PER HOUR
BTWN	BETWEEN
BUR	BUILT-UP ROOFING
BW	BOTH WAYS
CAB	CABINET
CAP	CAPACITY
CB	CATCH BASIN
CCT	CUBICLE CURTAIN TRACK
CCTV	CLOSED CIRCUIT TELEVISION
CE	COVER ELEVATION
CEM	CEMENT
CEM PLAS	CEMENT PLASTER
CER	CERAMIC
CFI	CONDUCTIVE FLOORING
CFLG	COUNTERFLASHING
CFM	CUBIC FEET PER MINUTE
CG	CORNER GUARD
CH BD	CHALKBOARD
CHFR	CHAMFER
CHIM	CHIMNEY
CHK	CHECK
CHR PL	CHROME PLATED
CI	CAST IRON
CI	CURB INLET
CIP	CAST-IN-PLACE
CIRC	CIRCULAR
CJ	CONTROL JOINT
CJ	CONSTRUCTION JOINT
CKT	CIRCUIT
CKT BRKR	CIRCUIT BREAKER
CL	CENTER LINE
CLG	CEILING
CLG HT	CEILING HEIGHT
CLGL	CLEAR GLASS
CLL	CONTRACT LIMIT LINE
CLO	CLOSET
CLOS	CLOSURE
CLR	CLEAR(ANCE)
CLWG	CLEAR WIRED GLASS
cm	CENTIMETER(S)
CMP	CORRUGATED METAL PIPE
CMPST	COMPOSITE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CNL	CONDUCTIVE NEOPRENE LATEX
CNR	CORNER
CNTR	COUNTER
CO	CLEANOUT
CO2	CARBON DIOXIDE
COL	COLUMN
COM	COMMON
COMB	COMBUSTION
COMPT	COMPARTMENT
CONC	CONCRETE
CONN	CONNECT
CONSTR	CONSTRUCTION
CONT	CONTINUE
CONTR	CONTRACTOR
CORR	CORRIDOR
COV	COVER
CPRS	COMPRESSIBLE
CPT	CARPET
CRCMF	CIRCUMFERENCE
CRES	CORROSIVE RESISTANT STEEL
CRG	CROSS GRAIN
CRS	COURSE(S)
CS	CAST STONE
CSK	COUNTERSUNK
CSMT	CASEMENT
CT	CERAMIC TILE
CT	CURRENT TRANSFORMER
C TO C	CENTER TO CENTER
CTR	CENTER
CU	CONDENSING UNIT
Cu	COPPER
CU FT	CUBIC FEET
CUH	CABINET UNIT HEATER
CU YD	CUBIC YARDS
CV	CEILING VENT
CVH	CONDUCTIVE VINYL HOMOGENEOUS (SHEET TYPE)
CW	COLD WATER
CYL	CYLINDER
d	PENNY (AS IN NAIL - 10D)
DAT	DATUM
DB	DRY BULB
DBL	DOUBLE
DBL ACT DR	DOUBLE ACTING DOOR
DCJ	DOWELED CONTROL JOINT
DCJT	DUMMY CONTROL JOINT
DEG	DEGREE
DEMO	DEMOLITION
DEPR	DEPRESSION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DH	DOUBLE HUNG
DH	DUCT HEATER
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISC	DISCONNECT
DISP	DISPENSER
DISTR PNL	DISTRIBUTION PANEL
DIV	DIVISION
DL	DEAD LOAD
DMPF	DAMPPROOFING
DMPR	DAMPER
DMT	DEMOUNTABLE
DN	DOWN
DR	DOOR
DR	DRAIN
DRB	DRAINBOARD
DR CL	DOOR CLOSER
DS	DOUBLE STRENGTH (GLASS)
DS	DOWNSPOUT
DT	DRAIN TILE
DVTL	DOVETAIL
DWG	DRAWING
DWLS	DOWELS
DWR	DRAWER
DWTR	DUMBWAITER
DX	DIRECT EXPANSION
E	EAST
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION - GRADE OR BUILDING
ELEC	ELECTRIC
EM	EXPANDED METAL
EMD	ESTIMATED MAXIMUM DEMAND
EMER	EMERGENCY
ENCL	ENCLOSE(URE)
ENTR	ENTRANCE, ENTERING
EP	ELECTRICAL PANELBOARD
EPRF	EXPLOSION PROOF
EPY	EPOXY COATING
EQ	EQUAL
EQUIP	EQUIPMENT
ESCAL	ESCALATOR
EST	ESTIMATE(D)
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXC	EXCAVATE
EXH	EXHAUST
EXH A	EXHAUST AIR
EXST	EXISTING
EXP	EXPANSION
EXP	EXPOSED
EXP BT	EXPANSION BOLT
EXT	EXTERIOR
F	FAHRENHEIT
FA	FIRE ALARM
FA	FRESH AIR
FAC	FIRE APPARATUS CLOSET
FAI	FRESH AIR INTAKE
F BRK	FIRE BRICK
FC	FOOT CANDLE
FC BRK	FACE BRICK
FCG	FACING
FCJ	FLOOR CONSTRUCTION JOINT
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDMPR	FIRE DAMPER
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEB	FIRE EXTINGUISHER BRACKET
FEC	FIRE EXTINGUISHER CABINET
FF	FACTORY FINISH
FGL	FIBERGLASS
FH	FIRE HYDRANT
FH	FLAT HEAD
FHC	FIRE HOSE CABINET
FHMS	FLAT HEAD MACHINE SCREW
FHR	FIRE HOSE RACK
FHS	FIRE HOSE STATION
FHWS	FLAT HEAD WOOD SCREW
FIG	FIGURE
FIN	FINISH
FIN FLR	FINISH FLOOR
FIXT	FIXTURE
FJT	FLUSH JOINT
FLASH	FLASHING
FLR	FLOOR
FLEX	FLEXIBLE
FLG	FLOORING
FLR PL	FLOOR PLATE
FLUOR	FLUORESCENT
FN	FENCE
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FP	FIRE PARTITION
FP	FIREPROOF
FPM	FEET PER MINUTE
FR	FIRE RESISTANT
FR	FRAME
FRG	FORGED
FRMG	FRAMING
FRT	FIRE-RETARDANT
FS	FULL SIZE
FSTNR	FASTEN(ER)
FT	FEET
FTG	FOOTING
FURG	FURRING
FUT	FUTURE
FW	FIRE WATER
FWC	FABRIC WALL COVERING
G	NATURAL GAS
GA	GAGE
GAL	GALLON(S)
GALV	GALVANIZED
GALV STL	GALVANIZED STEEL
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GEN	GENERAL
GF	GROUND FACE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFE	GOVERNMENT-FURNISHED EQUIPMENT
GFE/CI	GOVERNMENT-FURNISHED EQUIPMENT CONTRACTOR INSTALLED
GI	GALVANIZED IRON
GIP	GALVANIZED IRON PIPE
GKT	GASKET(ED)
GL	GLASS
GL BLK	GLASS BLOCK
GLF	GLASS FIBER
GLZ	GLAZING
GLZ CMU	GLAZED CONCRETE MASONRY UNITS
G	GROUND
GOVT	GOVERNMENT
GPM	GALLONS PER MINUTE
GPT	GYPSUM TILE
GRAN	GRANITE
GR LN	GRADE LINE
GRTG	GRATING
GST	GLAZED STRUCTURAL TILE
GSU	GLAZED STRUCTURAL UNITS
GT	GROUT
GWT	GLAZED WALL TILE
GYP	GYPSUM
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTER
HB	HOSE BIBB
HC	HOLLOW CORE
HCD	HALON CONTAINMENT DAMPER
HCP	HANDICAPPED
HD	HEAD
HD	HEAVY DUTY
HDBD	HARDBOARD
HD JT	HEAD JOINT
HDR	HEADER
HDW	HARDWARE
HDWD	HARDWOOD
HES	HIGH EARLY-STRENGTH CEMENT
HEX	HEXAGON
HH	HANDHOLE
HK	HOOK(S)
HM	HOLLOW METAL
HNDRL	HANDRAIL
HORIZ	HORIZONTAL
HP	HIGH PRESSURE
HP	HORSEPOWER
HPT	HIGH POINT
HR	HOUR
HS	HIGH STRENGTH
HSGYP	HIGH-STRENGTH GYPSUM PLASTER
HSKPG	HOUSEKEEPING
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HYDR	HYDRAULIC
Hz	HERTZ
IC	INTERCOM
ID	INSIDE DIAMETER
IESNA	ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA
ILK	INTERLOCK
IN	INCH
INCIN	INCINERATOR
INCL	INCLUDED
INSF	INSULATING FILL
INSUL	INSULATION
INT	INTERIOR
INTM	INTERMEDIATE
INV	INVERT
IP	IRON PIPE
IPS	IRON PIPE SIZE
I.P.S.	INSIDE PIPE SIZE
JAN CLO	JANITOR'S CLOSET
J-BOX	JUNCTION BOX
JCT	JUNCTION
JST	JOIST
JT	JOINT
KIP	KILOPOUND (1000 POUNDS)
KIT	KITCHEN
KOP	KNOCKOUT PANEL
KPL	KICKPLATE
km	KILOMETER
kV	KILOVOLTS
kVA	KILOVOLT AMPERES
kVAR	KILOVOLT AMPERES REACTIVE
kW	KILOWATT
KWY	KEYWAY
LAB	LABORATORY
LAD	LADDER
LAM	LAMINATE
LAT	LEAVING AIR TEMPERATURE
LAU	LAUNDRY
LAV	LAVATORY
LB	LAG BOLT
LB	POUND
LBL	LABEL
LBR	LUMBER
LC	LIGHT CONTROL
LD	LOAD
LDG	LOADING
LG	LENGTH
LH	LEFT HAND(ED)
LIN	LINEAR
LKR	LOCKER
LL	LIVE LOAD
LLD	LEAD-LINED DOOR
LM	LUMEN
LMST	LIMESTONE
LNTL	LINTEL
LONG	LONGITUDINAL
LP	LIGHTPROOF
LPD	LIGHTPROOF DOOR
LPL	LIGHTPROOF LOUVER
LPT	LOW POINT
LR	LIVING ROOM
LS	LAWN SPRINKLER
LT	LIGHT
LT WT	LIGHTWEIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LVR	LOUVER
LWC	LIGHTWEIGHT CONCRETE
LWT	LEAVING WATER TEMPERATURE
m	METER(S)
M&B	MATCHED AND BEADED
MACH	MACHINE
MAS	MASONRY
MATL	MATERIAL(S)
MAX	MAXIMUM
MB	MACHINE BOLTS
MBR	MEMBER
MC	MEDICINE CABINET
MCJ	MASONRY CONTROL JOINT
MCO	METAL-CASED OPENING
MDS	METAL DIVIDER STRIP
MECH	MECHANICAL
MECH RM	MECHANICAL ROOM
MED	MEDIUM
MEMB	MEMBRANE
MES	METAL EDGE STRIP
MFD	METAL FLOOR DECKING
MFG	MANUFACTURING
MFR	MANUFACTURER
MG	MOTOR GENERATOR
MGT	MATTE-GLAZED TILE
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
ML	METAL LATH
ML	MONOLITHIC
MLDG	MOULDING
MLWK	MILLWORK
mm	MILLIMETER(S)
MNIC	MATERIAL NOT IN CONTRACT (INSTALLATION BY CONTRACTOR)
MO	MASONRY OPENING
MOD	MODULAR
MOD.	MODIFIED
MOT	MOTOR
MP	MOVABLE PARTITION
MR	MOP RECEPTOR
MRB	MARBLE BASE
MRD	METAL ROOF DECKING
MS	MACHINE SCREWS
MT	METAL THRESHOLD
MT	MOUNT
MTD	MOUNTED
MTFR	METAL FURRING
MTL	METAL
MVBL	MOVABLE
MULL	MULLION
N	NORTH
NAT	NATURAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NI	NICKEL
NIC	NOT IN CONTRACT
NL	NAILABLE
N.L.	NEOPRENE LATEX
NM	NONMETALLIC
NO	NORMALLY OPEN
NO	NUMBER
NOM	NOMINAL
NR	NOISE REDUCTION
NRC	NOISE REDUCTION COEFFICIENT
N"REQD	NOT REQUIRED
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBSC	OBSCURE
OBW	OBSERVATION WINDOW
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OFC	OFFICE
OGL	OBSCURE GLASS
OH	OVERHEAD
OHMS	OVALHEAD MACHINE SCREW
OHWS	OVALHEAD WOOD SCREW
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OPQ	OPAQUE
OPS	OPERATIONS
OS & Y	OUTSIDE SCREW AND YOKE
OWGL	OBSCURE WIRED GLASS
P	POLE
PA	PUBLIC ADDRESS
PAR	PARALLEL
PB	PANIC BAR
PBD	PARTICLE BOARD
PBS	PUSH BUTTON STATION
PC	PIECE
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PCP	CEMENT PLASTER (PORTLAND)
PD	PAVEMENT DRAIN
PED	PEDESTAL
PERF	PERFORATE(D)
PERIM	PERIMETER
PH	PHASE
PHAR	PHARMACY
PI	POINT OF INTERSECTION
PIPU	PREFAB ISOLATION POWER UNIT
PIV	POST INDICATING VALVE
PL	PLATE
PL	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLAT	PLATFORM
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PLG	PILING
PL GL	PLATE GLASS
PLYWD	PLYWOOD
PNL	PANEL
PT	PAINT(ED)
POL	POLISHED
PORC	PORCELAIN
PORT	PORTABLE
PPGL	POLISHED PLATE GLASS
PPM	PARTS PER MILLION
PR	PAIR
PREFAB	PREFABRICATE(D)
PREFIN	PREFINISHED
PREFMD	PREFORMED
PRKG	PARKING
PROJ	PROJECT
PRV	PRESSURE-REGULATING VALVE
PS	PIPE SPACE
P.S.	PRESSED STEEL
PS CONC	PRESTRESSED CONCRETE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PNEUMATIC TUBE
PT.	POINT
PT CONC	POST-TENSIONED CONCRETE
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PTR	PAPER TOWEL RECEPTACLE
PV	PAVED
PVC	POLYVINYL CHLORIDE
PVG	PAVING
PW	PASS WINDOW
QT	QUARRY TILE
QT.	QUART
QTR	QUARTER
1/4 RND	QUARTER ROUND
QTY	QUANTITY
R	RADIUS
R	RANGE
R	RISER
RA	RETURN AIR
RAB	RABBETED
RA GR	RETURN AIR GRILLE
RAR	RETURN AIR REGISTER
RB	RUBBER BASE, RESILIENT BASE
RBL	RUBBLE STONE
RBR	RUBBER
RC	REMOTE CONTROL
RCP	REINFORCED CONCRETE PIPE
RCVR	RECEIVER
RD	ROOF DRAIN
RDG INS	RIGID INSULATION
RECPT	RECEPTACLE
REC ROOM	RECREATION ROOM
RECT	RECTIFIER
REF	REFERENCE
REFL	REFLECT
REFR	REFRIGERATION
REG	REGISTER
REG	REGLET
REINF	REINFORCE
REM	REMOVE(ABLE)
REQD	REQUIRED
RESIL	RESILIENT
RET	RETURN
REV	REVISION
RFG	ROOFING
RH	RELATIVE HUMIDITY
RH	RIGHT HAND
RH	ROOF HATCH
RK	RACK
RLG	RAILING
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RP	RETRACTABLE PARTITION
RPM	REVOLUTIONS PER MINUTE
RPRT	RAISED PATTERN RUBBER TILE
RTF	RUBBER TILE FLOOR
RVS	REVERSE
RVT	RIVET
RWC	RAINWATER CONDUCTOR
S	SOUTH
SA	SUPPLY AIR
SB	SPLASH BLOCK
S.B.	SECURITY BARS
SC	SOLID CORE
SCHED	SCHEDULE
SCRN	SCREEN
SCT	STRUCTURAL CLAY TILE
SD	STORM DRAIN
SDI	STEEL DOOR INSTITUTE
SECT	SECTION
SEQ	SEQUENCE
SFGL	SAFETY GLASS
SFTU	STRUCTURAL FACING TILE UNIT
SFU	STRUCTURAL FACING UNIT
SG	SHEET GLASS
SHLDR	SHOULDER
SHT	SHEET
SHTHG	SHEATHING
SHV	SHELVING
SIM	SIMILAR
SJI	STEEL JOIST INSTITUTE
SKLT	SKYLIGHT
SLNT	SEALANT
SLV	SLEEVE
SM	SHEET METAL
SMS	SHEET METAL SCREWS
SOV	SHUT OFF VALVE
SPC	SPACER
SPCL	SPECIAL
SPD	SOUNDPROOF DOOR
SPEC	SPECIFICATION
SPF	SOUNDPROOF
SP FIN	SPECIAL FINISH
SPH	SPACE HEATER
SPKR	SPEAKER
SQ	SQUARE
SQHD	SQUARE HEAD
S&R	SHELF AND ROD
SS	SERVICE SINK
SS	STANDING SEAM (ROOF)
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STG	SEATING
STL	STEEL
STOR	STORAGE
ST PR	STATIC PRESSURE
STR	STRINGER
STRUCT	STRUCTURAL
STWY	STAIRWAY
SUB FL	SUBFLOOR
SUSP	SUSPENDED
SV	SHEET VINYL
SW	SWITCH
SWBD	SWITCHBOARD
SYMM	SYMMETRICAL
SYNTH	SYNTHETIC
SYS	SYSTEM
T	TREAD
TAN	TANGENT
TB	TOWEL BAR
TC	TERRA COTTA
TEL	TELEPHONE
TEMP	TEMPERATURE
TEMP	TEMPORARY
TER	TERRAZZO
TERM	TERMINAL
T&G	TONGUE AND GROOVE
TGL	TOGGLE
TH	TRUSS HEAD
THK	THICK(NESS)
THRES	THRESHOLD
TK BD	TACKBOARD
TKS	TACKSTRIP
TO	TOP OF
TOL	TOLERANCE
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TPTN	TOILET PARTITION
TRANS	TRANSOM
TRANS	TRANSVERSE
TSTAT	THERMOSTAT
TV	TELEVISION
TYP	TYPICAL
UC	UNIT COOLER
UGND	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
UPS	UNINTERRUPTABLE POWER SUPPLY
UR	URINAL
UTIL	UTILITY
UV	UNIT VENTILATOR
V	VOLT
VAR	VARNISH
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VCT	VITRIFIED CLAY TILE
VD	VAULT DOOR
VENT	VENTILATOR(TION)
VERT	VERTICAL
VEST	VESTIBULE
VF	VINYL FABRIC
VG	VERTICAL GRAIN
VH	VINYL HOMOGENEOUS
VJ	V-JOINT(ED)
VNR	VENEER
VOL	VOLUME
VR	VAPOR RETARDER
VRM	VERMICULITE
VS	VENT STACK
V.T.	VOLTAGE TRANSFORMER
VTR	VENT THRU ROOF
VWC	VINYL WALL COVERING
W	WEST
W/	WITH
WB	WET BULB
WBL	WOOD BLOCKING
WC	WATER CLOSET
W/C	WHEELCHAIR
WCO	WOOD-CASED OPENING
WD	WOOD
WD	WOOD DOOR
WDSP	WASTE DISPOSER
WDW	WINDOW
WF	WIDE FLANGE
WGL	WIRED GLASS
WH	WALL HUNG
WH	WATER HEATER
WHB	WHEEL BUMPER
WHM	WATT-HOUR METER
WI	WROUGHT IRON
WKSH	WORK SHOP
WM	WIRE MESH
W/O	WITHOUT
WP	WATERPROOF(ING)
WP	WEATHERPROOF
WP	WORKING POINT
WR	WASTE RECEPTACLE
WRB	WARDROBE
WS	WATERSTOP
W.S.	WASTE STACK
WSCT	WAINSCOT
WT	WEIGHT
WTH	WIDTH
W/W	WALL TO WALL
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
WWR	WELDED WIRE REINFORCEMENT
XFMR	TRANSFORMER
YD	YARD
YD	YARD DRAIN

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

GENERAL ABBREVIATIONS

SHEET ID
SITE 10
G-002

PRE-FINAL SUBMITTAL

LEGEND

BM — BENCHMARK

BREAKLINE

CENTERLINE

CORING HOLE

HORIZONTAL CONTROL POINT GROUT

HORIZONTAL AND VERTICAL CONTROL POINT

FLOW — FLOW ARROW

123 — INTERSTATE HIGHWAY

PLAN NORTH — NORTH INDICATOR, PLAN

TRUE N — NORTH INDICATOR, TRUE

RAILROAD

RIVER MILE

SL — SLOPE

123 — STATE HIGHWAY

STEEL

123 — US HIGHWAY

WORK LIMITS

12 — KEYNOTE

INDICATES NEW CONCRETE IN SECTION

INDICATES GROUT

INDICATES STEEL IN SECTION

INDICATES GRANULAR SURFACE

INDICATES ROCK

INDICATES SOIL

INDICATES RIPRAP

INDICATES BEDDING STONE

DRAWING SET LAYOUT

1. THIS SHEET EXPLAINS THE GENERAL LAYOUT OF THE DRAWING PACKAGE. THE INTENT OF THIS SHEET IS TO PROVIDE A DESCRIPTIVE OVERVIEW OF THE DRAWING PACKAGE TO ALLOW THE CONTRACTOR TO MORE EASILY NAVIGATE THROUGH THE SET.
2. THE DRAWING SET IS DEVIDED INTO PLAN SETS ASSOCIATED WITH DIFFERENT SCOPES OF WORK IN THE PROJECT, WITH SUBCOMPONENT SHEETS UNDER EACH PLANSET.
3. IN ORDER TO NAVIGATE THE DRAWING SET, THE CONTRACTOR SHOULD FOCUS ON THE SHEET ID BLOCK IN THE LOWER RIGHT HAND CORNER OF EACH SHEET. THE SHEET ID BLOCK CONTAINS THE FOLLOWING INFORMATION:

SHEET ID
PLAN SET ID
G-003

- PLAN SET ID
- SHEET NUMBER WITHIN PLAN SET
- SEQUENCIAL NUMBER
- SHEET TYPE DESIGNATIONS
- DISCIPLINE (STRUCTURAL, MECHANICAL ELECTRICAL, CIVIL, ARCHITECTURAL, ETC.)

A. THE PLAN SET ID INDICATES THE MAJOR COMPONENT OF WORK DETAILED IN THE DRAWING PACKAGE. PLAN SET IDS ARE LISTED IN THE TABLE ON THE COVER SHEET

B. EACH SHEET WITHIN THE PLAN SET WILL HAVE A UNIQUE SHEET NUMBER, WITH EACH PLACEHOLDER HAVING A SPECIFIC MEANING. NOTE - SHEET NUMBERS MAY BE DUPLICATED BETWEEN PLAN SET IDS, SO PARTICULAR ATTENTION MUST BE PAID TO THE PLAN SET ID.

C. THE FIRST PLACEHOLDER WITHIN THE SHEET NUMBER IS THE ENGINEERING DISIPLINE WHICH THE SHEET WAS DEVELOPED BY.

D. THE THIRD PLACEHOLDER IS THE SHEET TYPE DESIGNATORS ARE ASSHOWN ON THIS SHEET.

E. THE FINAL TWO PLACEHOLDERS ARE THE SEQUENCIAL NUMBER OF THE SHEET.

SHEET TYPE DESIGNATORS

0 - GENERAL

1 - PLANS (SYMBOLS LEGEND, NOTES, ETC.)

2 - ELEVATIONS (VERTICAL VIEWS)

3 - SECTIONS (SECTIONAL VIEWS, WALL SECTIONS)

4 - LARGE-SCALE VIEWS (PLANS, ELEVATIONS, STAIR SECTION, OR SECTIONS THAT ARE NOT DETAILS)

5 - DETAILS

6 - SCHEDULES AND DIAGRAMS

7 - USER DEFINED (FOR TYPES THAT DO NOT FALL IN OTHER CATEGORIES)

8 - USER DEFINED (FOR TYPES THAT DO NOT FALL IN OTHER CATEGORIES)

9 - 3D REPRESENTATIONS (ISOMETRICSM PERSPECTIVES, PHOTOGRAPHS)

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

PLAN SET LAYOUT AND SHEET TYPE DESIGNATORS

SHEET ID
SITE 10
G-003

PRE-FINAL SUBMITTAL

SURVEY MONUMENTS

POINT	NORTHING	EASTING	ELEVATION(NAVD88)	DESCRIPTION
116	3756176.9430	5566966.5280	612.06	5/8" IRON ROD WITH PLASTIC CAP
117	3759664.8350	5565834.7210	628.97	5/8" IRON ROD WITH PLASTIC CAP

A1 SURVEY CONTROL PLAN
SCALE: 1"=500'

GENERAL NOTES

1. HYDROGRAPHIC SURVEY PERFORMED BY LOWE ENGINEERS, LLC ON 8/13/23.
2. DATUM:
   HORIZONTAL - STATE PLANE IOWA NORTH NAD83 GEOID18 US SURVEY FEET.
   VERTICAL - NAVD88 US SURVEY FEET.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

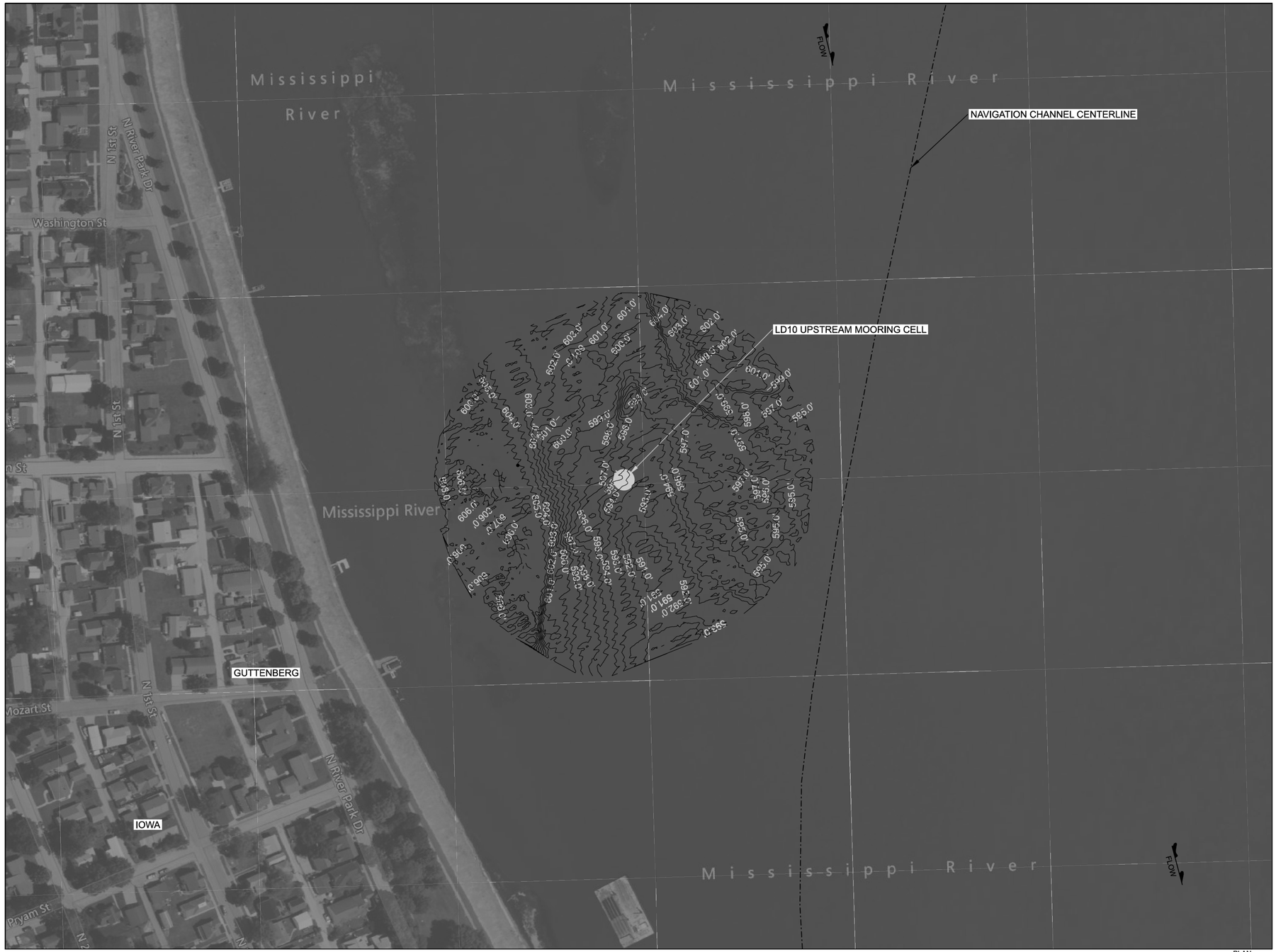
SURVEY CONTROL PLAN

SHEET ID
SITE 10
V-101

PRE-FINAL SUBMITTAL

GENERAL NOTES

1. HYDROGRAPHIC SURVEY PERFORMED BY LOWE ENGINEERS, LLC ON 8/13/23.
2. DATUM:
   HORIZONTAL - STATE PLANE IOWA NORTH NAD83 GEOID18 US SURVEY FEET.
   VERTICAL - NAVD88 US SURVEY FEET.



A1 SURVEY CONTROL PLAN
SCALE: 1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH	ISSUE DATE: MAY 2024
DRAWN BY: A. MARTIN	SOLICITATION NO.:
CHECKED BY: P. EICKENBERG	CONTRACT NO.:
SUBMITTED BY: R. WELSCH	
SIZE: ANSI D	

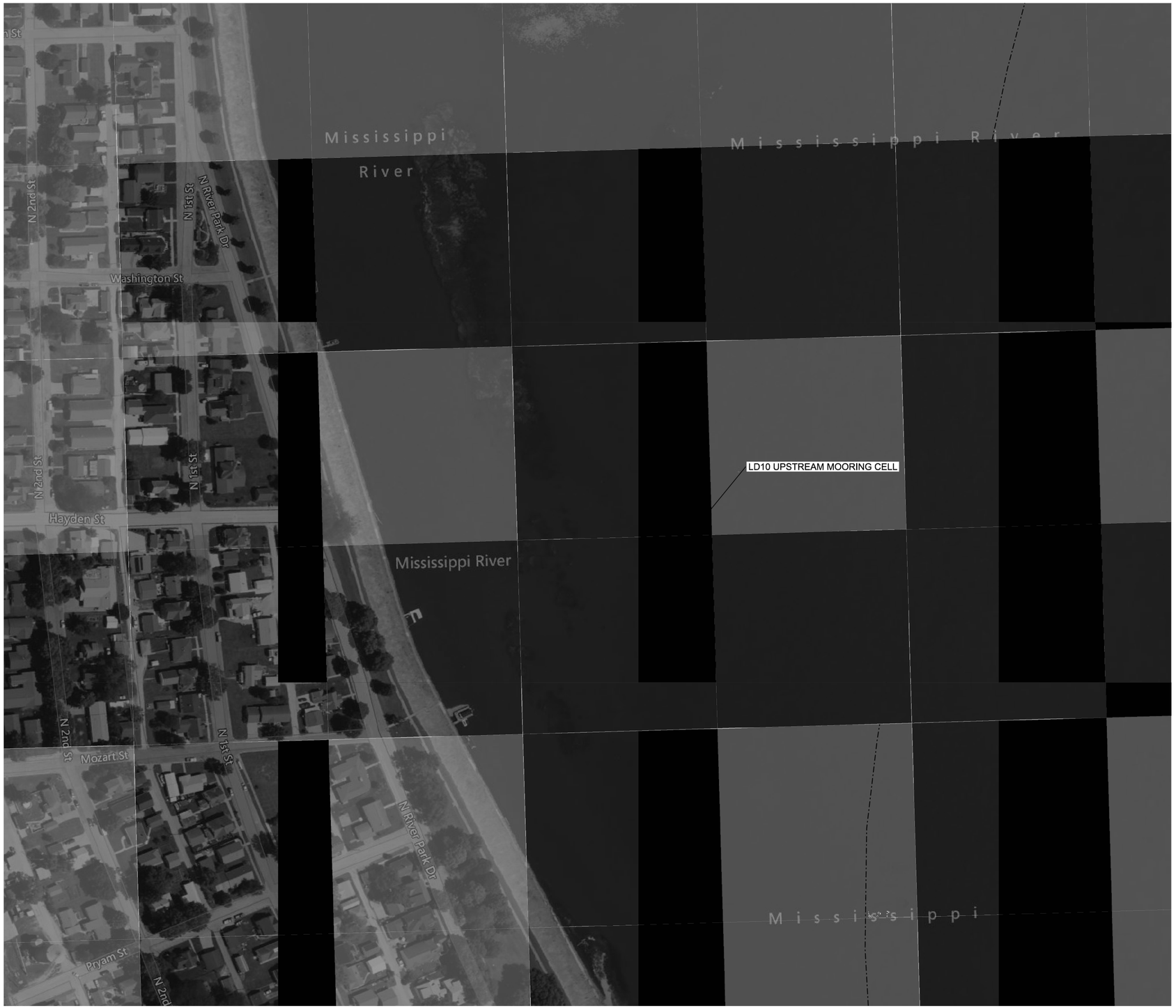
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

ENLARGED SURVEY CONTROL PLAN

SHEET ID
SITE 10
V-401

PRE-FINAL SUBMITTAL



		STING	LATITUDE	LONGITUDE
		6041.645	42.791402	-91.097426
		6054.083	42.791315	-91.097383

PLAN NORTH (TRUE N)

0 100' 200'

A1 SITE PLAN - BORING LOCATIONS
SCALE: 1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

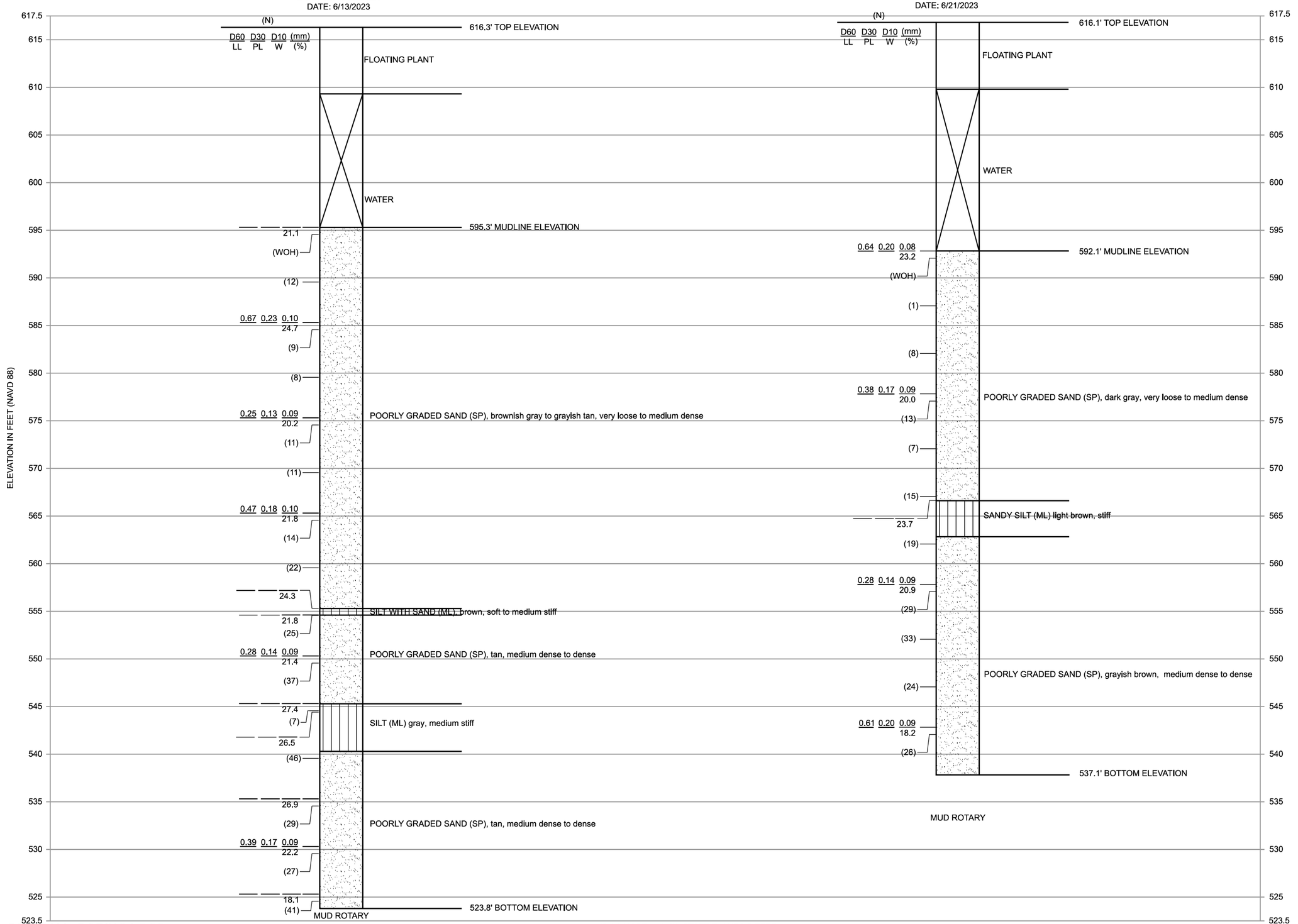
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

BORING LOCATIONS

SHEET ID
SITE 10
B-101

PRE-FINAL SUBMITTAL



A1 DIAGRAM - BORING LOGS
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

BORING LOGS

SHEET ID
SITE 10
B-601

PRE-FINAL SUBMITTAL

A1 SITE PLAN

SCALE: 1"=500'

GENERAL SHEET NOTES

1. SEE SHEET S-101 FOR CELL ORIENTATION WITH RESPECT TO NAVIGATION CHANNEL CENTERLINE.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

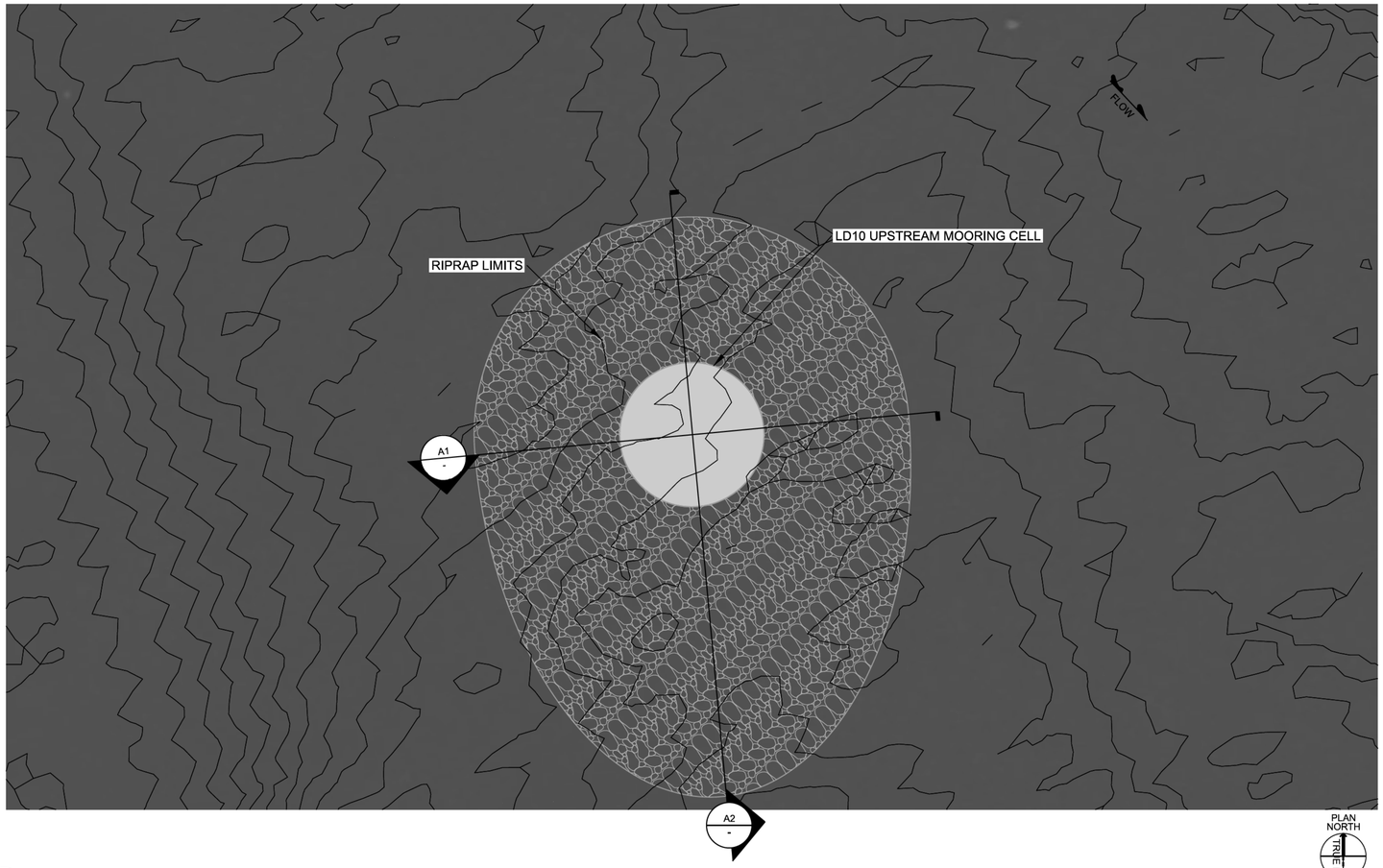
CIVIL SITE PLAN

SHEET ID
SITE 10
C-101

PRE-FINAL SUBMITTAL

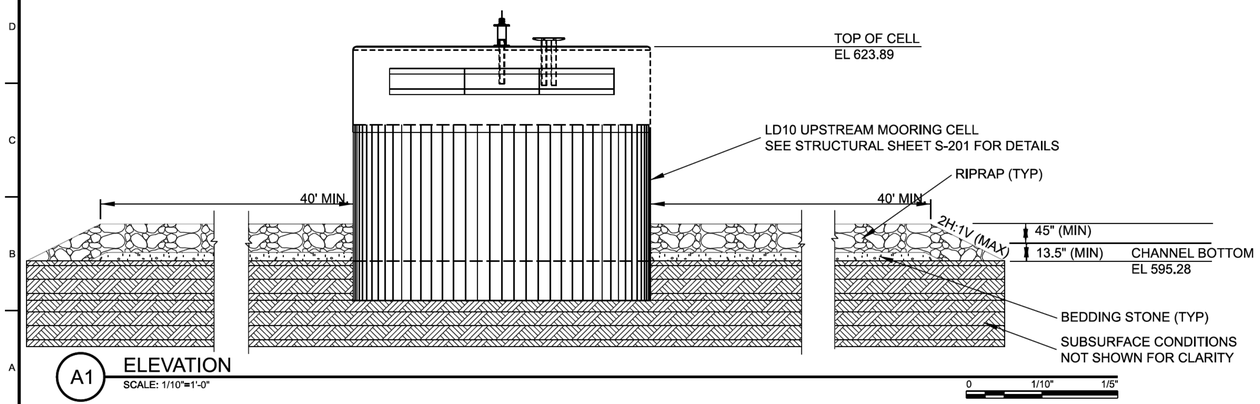
GENERAL SHEET NOTES

1. RIPRAP SHALL BE USACE-MVP R80 OR GOVERNMENT APPROVED EQUIVALENT.
2. BEDDING STONE SHALL BE BEDDING STONE B2 OR GOVERNMENT APPROVED EQUIVALENT.



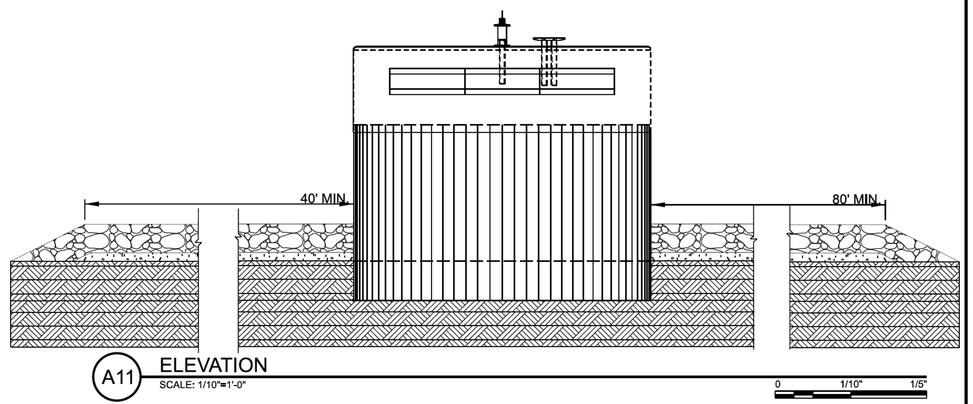
F1 PLAN
SCALE: 1"=20'

0 20' 40'



A1 ELEVATION
SCALE: 1/10"=1'-0"

0 1/10" 1/5"



A11 ELEVATION
SCALE: 1/10"=1'-0"

0 1/10" 1/5"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

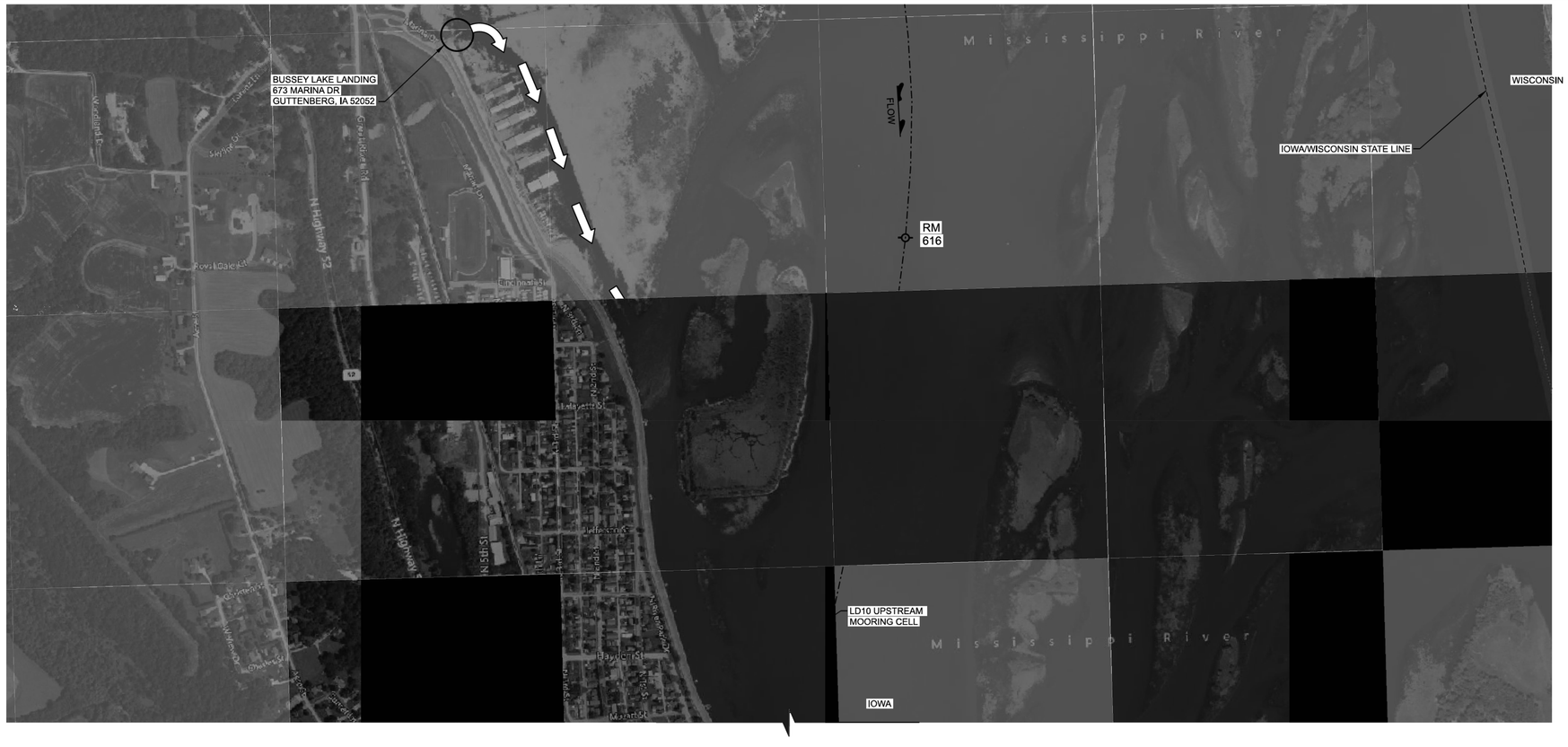
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

SCOUR PROTECTION PLAN

SHEET ID
SITE 10
C-102

PRE-FINAL SUBMITTAL



A1 STAGING AND ACCESS PLAN

SCALE: 1"=500'

GENERAL SHEET NOTES

1. VERIFY LOCATION AND LIMITS OF THE WORK LIMITS ACCESS ROUTES AND STAGING AREA WITH THE CONTRACTING OFFICER PRIOR TO CONSTRUCTION.
2. PORTION OF MOORING CELL IS ABOVE WATER. MOORING CELL IS IDENTIFIED AS SHOWN ON DRAWING.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

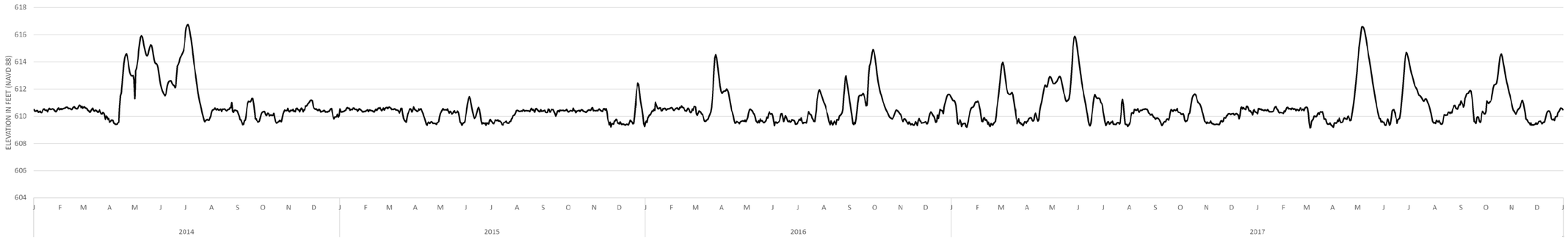
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

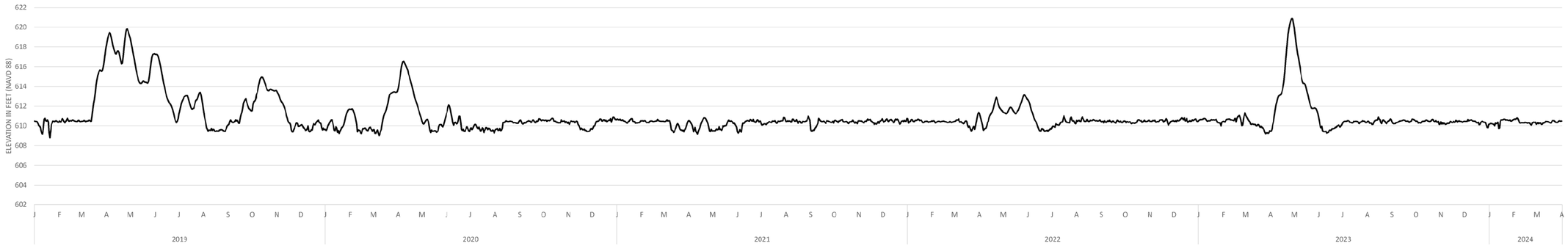
MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

STAGING AND ACCESS PLAN

SHEET ID
SITE 10
C-103

PRE-FINAL SUBMITTAL





NOTES:

1. THESE DAILY POOL ELEVATION HYDROGRAPHS ARE BASED ON TEN YEARS OF POOL ELEVATION OBSERVATIONS (START DATE 1/1/2014 TO 4/1/2024) RECORDED BY THE USACE ABOVE LOCK AND DAM 10 APPROXIMATELY 0.5 MILES DOWNSTREAM OF THE LOCK & DAM 10 MOORING CELL. OBSERVED POOL ELEVATIONS WERE CONVERTED TO THE NAVD 88 VERTICAL DATUM USING THE FOLLOWING EQUATION: MSL 1912 - 0.64' = NAVD 88

2. THESE DAILY POOL ELEVATION HYDROGRAPHS ARE BASED ON THE BEST INFORMATION AVAILABLE. THESE DAILY POOL ELEVATION HYDROGRAPHS REPRESENT THE PERIOD SHOWN AND DO NOT NECESSARILY REPRESENT ALL POSSIBLE FUTURE CONDITIONS. QUESTIONS MAY BE ADDRESSED TO THE OFFICE OF THE CORPS OF ENGINEERS ST PAUL, MINNESOTA.

MISSISSIPPI RIVER
LOCK & DAM 10

DAILY POOL ELEVATION HYDROGRAPH

JANUARY 1, 2014 - APRIL 1, 2024

A1 HYDROGRAPH - DAILY POOL ELEVATIONS
SCALE: NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. WELSCH
DRAWN BY: A. MARTIN
CHECKED BY: P. EICKENBERG
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

HYDROGRAPHS

SHEET ID
SITE 10
VH601

PRE-FINAL SUBMITTAL

GENERAL STRUCTURAL NOTES

1. IN CASE OF CONFLICT BETWEEN THE SPECIFICATIONS AND THESE NOTES, THE SPECIFICATIONS TAKE PRECEDENCE.
2. USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH ALL OTHER DRAWINGS. COORDINATE THE WORK OF OTHER TRADES INCLUDING, BUT NOT LIMITED TO, THE REQUIREMENTS FOR SLEEVES, INSERTS, HOLES, HANGERS, AND ANCHORS.
3. REPORT DISCREPANCIES IN DIMENSIONS BETWEEN DIFFERENT DRAWINGS TO THE CONTRACTING OFFICER PRIOR TO BEGINNING WORK IN AREAS THAT WILL BE AFFECTED.
4. THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE ONLY AFTER THE STRUCTURAL WORK CONTAINED IN THE DRAWINGS IS COMPLETED. DETERMINE ERECTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE, ITS COMPONENTS AND OCCUPANTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS. SUCH MATERIAL SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER COMPLETION OF THE PROJECT.
5. ELEVATIONS ON THE STRUCTURAL DRAWINGS ARE DENOTED AS (XXX.XX) REFERENCED TO THE REFERENCE ELEVATION, NAVD88 DATUM.
6. REPRODUCTION OF CONTRACT DRAWINGS SHALL NOT BE USED AS SHOP DRAWINGS UNDER ANY CIRCUMSTANCE.
7. UNLESS OTHERWISE SHOWN OR NOTED, COORDINATE THE LOCATION AND PLACEMENT OF ANY INSERTS, HANGERS, PIPE SLEEVES OR HOLES REQUIRED FOR MECHANICAL OR ELECTRICAL EQUIPMENT.
8. NOTIFY THE CONTRACING OFFICER OF ANY DISCREPANCIES OR UNDOCUMENTED CONDITIONS THAT MAY AFFECT THE COMPLETION OF THIS WORK.
9. ALL DIMENSIONS AND GRADES SHOWN ON THE PLANS SHALL BE FIELD-VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE BENCHMARK SHALL BE FIELD-VERIFIED PRIOR TO CONSTRUCTION. NOTIFY THE CONTRACTING OFFICER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN OR GRADE CHANGES.

STRUCTURAL STEEL NOTES

1. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, FIFTEENTH EDITION.
2. PROVIDE MATERIAL IN ACCORDANCE WITH THESE PLANS AND THE SPECIFICATIONS.
3. ALL BOLTED CONNECTIONS NOT DETAILED SHALL BE DESIGNATED AS BEARING-TYPE CONNECTIONS.
4. GALVANIZED HARDWARE SHALL BE COATED IN ACCORDANCE WITH ASTM A153. GALVANIZED STEEL SHAPES SHALL BE COATED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.
5. ALL STEEL WELDING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AWS D1.1 OR D1.5, AS SPECIFIED. ALL STEEL WELDING SHALL BE CONDUCTED USING LOW HYDROGEN PROCESSES AND 70 KSI WELD METALS.
6. WELDING SYMBOLS SHOWN ARE THOSE ADOPTED BY THE AWS AND INDICATE ONLY SIZE AND TYPE OF WELDS REQUIRED. DETAILED INFORMATION SHALL BE SHOWN ON THE SHOP DRAWINGS AND SUBMITTED BY THE CONTRACTOR FOR APPROVAL.
7. DIMENSIONS SHOWN OR CALLED FOR ARE THE FINAL DIMENSIONS; ALLOWANCES MUST BE MADE FOR MACHINING.
8. FULLY WRAP ALL FILLET WELDS AROUND THE ENDS OF PLATES. SUFFICIENTLY SIZE WELD ACCESS HOLES TO PERMIT WELD WRAPPING TO PREVENT THE INTERSECTION OF WELDS UTILIZING THE SAME WELD PROCESS AND FILLET SIZE.
9. PAINT OR COAT ALL BARE OR EXPOSED STEEL, WELD, SCRATCHES, GRIND AREAS, ETC. AS SPECIFIED.
10. COAT ALL ALUMINUM IN CONTACT WITH CONCRETE WITH TWO COATS OF BITUMINOUS PAINTS (SSPC - PAINT 12, CONTAINING NO ASBESTOS FIBERS) OR PRESCRIBED TREATMENT FROM MANUFACTURER/FABRICATOR.
11. ALL WELDS THAT ARE TO BE GROUND SHALL HAVE A FINISHED SURFACE EQUAL TO OR SMOOTHER THAN THE MILL FINISH OF THE MATERIAL BEING WELDED, UNLESS NOTED OTHERWISE.
12. ITEMS MARKED CRES SHALL BE CORROSION RESISTANT STEEL (STAINLESS STEEL), SEE SPECIFICATIONS.
13. THE DIMENSIONAL TOLERANCES OF ALL WELDED FABRICATED STRUCTURAL STEEL MEMBERS TO BE IN ACCORDANCE WITH THE SPECIFICATION.
14. TESTING AND INSPECTION OF WELDS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AWS D1.1 OR AWS D1.5, AS SPECIFIED.
15. COAT ALL FAYING SURFACES WITH PRIMER PRIOR TO ASSEMBLY, WITH THE EXCEPTION OF GALVANIZED SURFACES.
16. ALL SHEET PILING IS TO BE PS 27.5.

CONCRETE NOTES

1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE AMERICAN CONCRETE INSTITUTE (ACI) SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301) EXCEPT AS OTHERWISE INDICATED. ALL CONCRETE DESIGN PERFORMED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH ACI 318.
2. PROPERLY PLACE ALL EMBEDDED ITEMS SUCH THAT THEY ARE ACCURATELY POSITIONED AND SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.
3. CHAMFER ALL EXPOSED CONCRETE CORNERS 3/4" UNLESS NOTED OTHERWISE.
4. FOR CONCRETE COMPRESSIVE STRENGTH (f'c), REFER TO SPECIFICATION 03 31 00.
5. CONSTRUCTION JOINT LOCATIONS SHALL BE APPROVED BY THE CONTRACTING OFFICER.

REINFORCING NOTES

1. UNLESS NOTED OTHERWISE, ALL CONCRETE WORK, DETAILING, FABRICATION, AND PLACING OF REINFORCING BARS AND CONCRETE SHALL BE GOVERNED BY THE LATEST REVISION OF:
   - A. ACI 301, ACI 315R, AND ACI 318
   - B. CRSI RECOMMENDED PRACTICE OF PLACING REINFORCING BARS.
   - C. ACI 306 AND ACI 305 FOR COLD AND HOT WEATHER CONCRETING RESPECIVELY.
2. REINFORCEMENT SHALL CONFORM TO ASTM A615, GRADE 60 (FY = 60,000 PSI).
3. REINFORCING BAR DESIGNATION NUMBERS CONFORM TO THE NUMBERING SYSTEM OF THE CONCRETE REINFORCING STEEL INSTITUTE.
4. REINFORCEMENT SHALL BE CONTINUOUS AT CORNERS.
5. REINFORCEMENT SHALL BE CONTINUOUS ACROSS CONSTRUCTION JOINTS. REINFORCEMENT SHALL NOT BE CONTINUOUS ACROSS EXPANSION JOINTS.
6. WHERE NECESSARY TO AVOID OPENINGS, PIPES, EMBEDDED, ITEMS AND OTHER OBSTRUCTIONS, REINFORCEMENT SHALL BE BENT OR SHIFTED AS DIRECTED BY THE CONTRACTING OFFICER. CLEAR COVER, EMBEDMENT, AND SPLICE LENGTHS TO BE IN ACCORDANCE WITH ACI 318-14, UNLESS OTHERWISE NOTED.
7. MINIMUM SPLICE AND EMBEDMENT LENGTHS ARE SHOWN IN THE TABLE ON THIS SHEET, EXCEPT AS SHOWN OR NOTED ON THE DRAWINGS. THIS TABLE APPLIES TO UNCOATED BARS ONLY. TOP BARS ARE BARS HAVING MORE THAN 12" OF CONCRETE CAST BELOW. PROVIDE HOOKS IF THE REQUIRED STRAIGHT EMBEDDED LENGTH CANNOT BE OBTAINED. SPLICE LENGTH SHALL BE BASED ON THE SMALLER BAR BEING LAPPED. SPLICES MAY BE MADE WHERE ESSENTIAL FOR CONSTRUCTABILITY AND APPROVED BY THE CONTRACTING OFFICER.

REINFORCEMENT EMBEDMENT AND SPLICE TABLE

BAR SIZE	MIN. DEVELOPMENT LENGTH, IN.		MIN. CLASS B LAP LENGTH, IN.	
	TOP	OTHER	TOP	OTHER
4	24	18	32	24
5	30	23	39	30
6	35	27	46	36
7	51	40	67	52
8	59	45	77	59

8. FIELD BENDING OF REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE IS NOT ALLOWED UNLESS APPROVED BY THE CONTRACTING OFFICER.
9. NO WELDING SHALL BE PERMITTED ON REINFORCEMENT UNLESS OTHERWISE SHOWN ON THE DRAWINGS. WELDING SHALL COMPLY WITH AWS D1.4.
10. BAR SPACING INDICATED ON REINFORCING DRAWINGS IS A MAXIMUM. ACTUAL SPACING OF REINFORCEMENT SHALL BE DICTATED BY THE GEOMETRY AND DIMENSIONS SHOWN ON THE DRAWINGS.
11. MINIMUM CLEAR COVER TO THE NEAREST SURFACE FOR REINFORCEMENT EXCEPT AS OTHERWISE INDICATED SHALL BE:

A. FORMED AND SCREEDED SURFACES:
   1. 12" OR LESS IN THICKNESS.....PER ACI 318
   2. GREATER THAN 12" AND LESS THAN 23" THICK.....3"
   3. EQUAL TO OR GREATER THAN 24" THICK.....4"
   4. UNFORMED SURFACE IN CONTACT WITH SUBGRADE...4"
   5. SURFACES EXPOSED TO ABRASION AS INDICATED ON DRAWINGS.....6"

B. IN NO CASE SHALL THE COVER BE LESS THAN:
   1. 1.5 TIMES THE NOMINAL MAXIMUM SIZE OF THE AGGREGATE.
   2. 2.5 TIMES THE MAXIMUM DIAMETER OF THE REINFORCEMENT.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: J. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

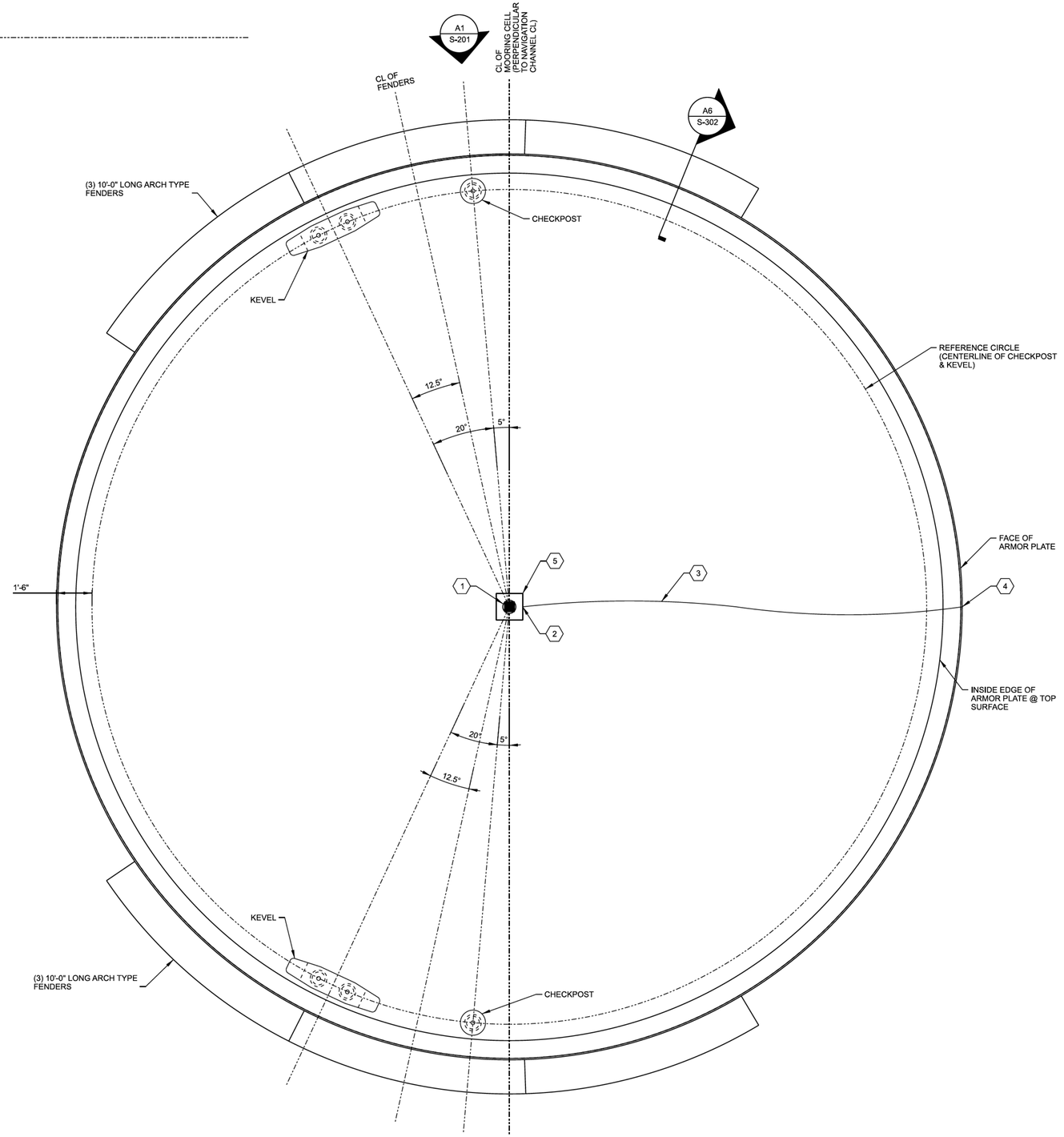
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

GENERAL NOTES
STRUCTURAL

SHEET ID
SITE 10
S-001

PRE-FINAL SUBMITTAL



GENERAL SHEET NOTES

1. EXACT LOCATION OF CELL IS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR, AS APPROVED BY THE CONTRACTING OFFICER AND A REPRESENTATIVE OF THE OPERATIONS DIVISION OF THE ST. PAUL DISTRICT.
2. THE CELL CENTERLINE SHOULD BE ORIENTED SO THAT IT IS PERPENDICULAR TO THE CENTERLINE OF THE NAVIGATION CHANNEL, THE CHECKPOSTS SHOULD BE ORIENTED 5° FROM THE CELL CENTERLINE IN THE UPSTREAM DIRECTION.
3. INSTALL BRASS MARKER FOR SURVEY WITHIN A 5 FT RADIUS OF THE CENTER OF THE CELL.

SHEET KEYNOTES

1. PROVIDE ONE MARINE NAVIGATION LIGHT FIXTURE ATOP NEW FABRICATED STRUCTURAL STEEL STAND. SEE S-513 FOR DETAILS.
2. PROVIDE EXOTHERMIC WELD TERMINATION OF 2/0 AWG BARE STRANDED COPPER GROUNDING CONDUCTOR TO STEEL STAND BASE PLATE. PROVIDE AND APPLY NO-OXIDE COMPOUND TO COMPLETED TERMINATION.
3. PROVIDE 2/0 AWG BARE STRANDED COPPER GROUNDING CONDUCTOR FROM STRUCTURAL STEEL STEEL STAND BASE PLATE ROUTED BURIED, EMBEDDED OR CONCEALED HORIZONTALLY TO THE MOORING CELL STEEL SHEET PILE.
4. PROVIDE EXOTHERMIC WELD TERMINATION OF 2/0 AWG BARE STRANDED COPPER GROUNDING CONDUCTOR TO MOORING CELL STEEL SHEET PILE. PROVIDE AND APPLY NO-OXIDE COMPOUND TO COMPLETED TERMINATION.
5. LIGHT STAND, SEE S-513 FOR DETAILS.

A1 PLAN MOORING CELL
SCALE: 3/8"=1'-0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

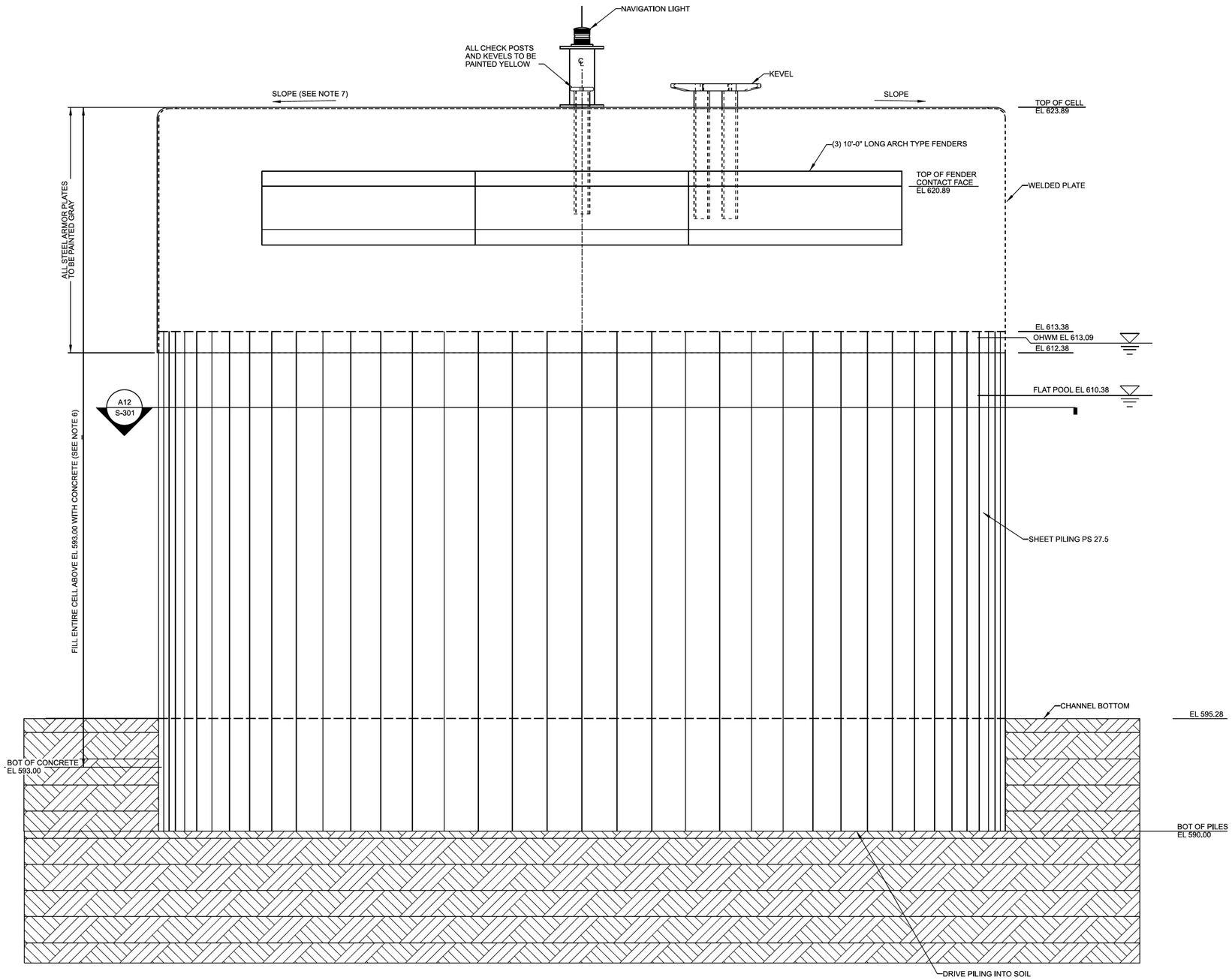
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

PLAN
MOORING CELL

SHEET ID
SITE 10
S-101

PRE-FINAL SUBMITTAL



A1 ELEVATION
SCALE: 3/8"=1'-0"

0 2' 4' 8'

GENERAL SHEET NOTES

1. EXACT LOCATION OF CELL IS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR, AS APPROVED BY THE CONTRACTING OFFICER AND A REPRESENTATIVE OF THE OPERATIONS DIVISION OF THE ST. PAUL DISTRICT.
2. ANY CHANGES TO THE PROPOSED LOCATION NEED TO BE APPROVED BY CONTRACTING OFFICER AND A REPRESENTATIVE OF THE OPERATIONS DIVISION OF THE ST. PAUL DISTRICT.
3. THE CELL SHOULD BE ORIENTATED WITH THE CHECK POSTS AT 5° FROM A LINE PERPENDICULAR TO THE CENTERLINE OF THE CHANNEL.
4. THE CONTRACTOR SHALL SUBMIT A COMPLETE SCHEDULE OF ERECTION PROCEDURES INCLUDING DRIVING TEMPLATES AND SUPPORTS FOR APPROVAL.
5. ALL STEEL SHEET PILING SHALL BE DRIVEN USING A STEEL DRIVING TEMPLATE SECURELY ANCHORED TO THE RIVER BOTTOM WITH APPROVED METHODS.
6. TREMIE CONCRETE TO BE USED FOR CELL FILL MUST MEET THE REQUIREMENTS OF THE ACI MANUAL OF CONCRETE PRACTICE. CONCRETE SHALL NOT BE PLACED UNDERWATER WHEN THE WATER TEMPERATURE IS 50°F OR LOWER. CONCRETE 5' ABOVE THE WATER LINE AT THE TIME OF PLACEMENT SHALL BE PLACED BY CONVENTIONAL METHODS IN THE DRY.
7. EXCAVATE IN SITU MATERIAL TO WITHIN 3 FT OF THE SHEET PILE TIP ELEVATION.
8. THE CENTER OF THE CIRCULAR CELL SHALL BE 624.23 SLOPING TO EL 623.89 AT THE EDGES. SURFACE SHALL HAVE A LIGHT BROOM FINISH, PARALLEL TO FLOW OF RIVER.
9. DRIVE SHEET PILES 1 FOOT ABOVE TOP OF SHEET PILE ELEVATION SHOWN TO ALLOW FOR POTENTIAL SETTLEMENT DURING CONSTRUCTION. TOP OF SHEET PILE TO BE CUT TO ELEVATION SHOWN PRIOR TO INSTALLING ARMOR PLATE.
10. ONCE SHEET PILES HAVE BEEN DRIVEN AND INTERIOR OF THE CELL HAS BEEN EXCAVATED TO THE DEPTH SHOWN, PLACE AN INITIAL 2 FT THICK LAYER OF CONCRETE TO PROVIDE A LEVEL SURFACE AGAINST POSSIBLE DIFFERENTIAL SETTLEMENT.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: M. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

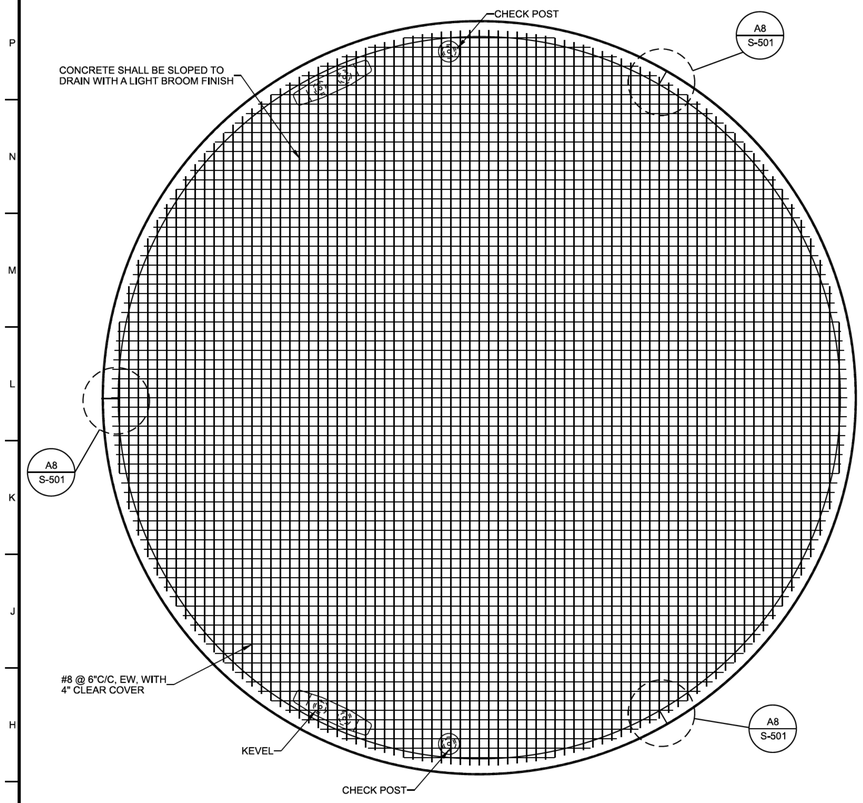
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

ELEVATION
MOORING CELL

SHEET ID
SITE 10
S-201

PRE-FINAL SUBMITTAL



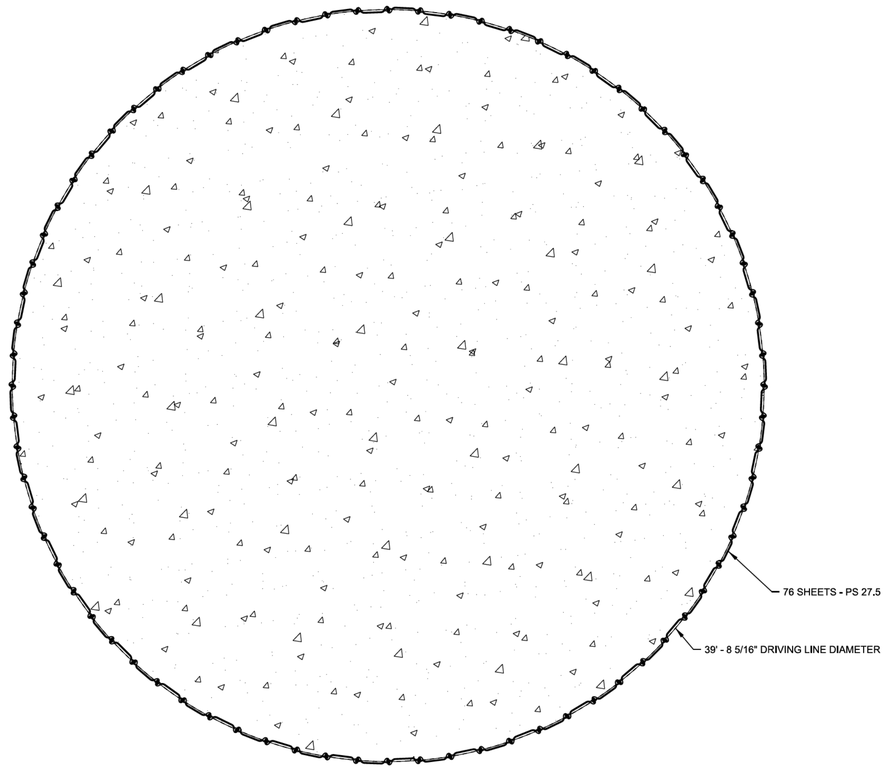
G1 SECTION - REINFORCING PLAN

SCALE: 1/4"=1'-0"

0 2' 4' 8'

GENERAL SHEET NOTES

1. EXACT LOCATION OF CELL IS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR, AS APPROVED BY THE CONTRACTING OFFICER AND A REPRESENTATIVE OF THE OPERATIONS DIVISION OF THE ST. PAUL DISTRICT.
2. THE CELL SHOULD BE ORIENTATED WITH THE CHECK POSTS AT 5° FROM A LINE PERPENDICULAR TO THE CENTERLINE OF THE NAVIGATION CHANNEL.



A12 SECTION

SCALE: 1/4"=1'-0"

0 2' 4' 8'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

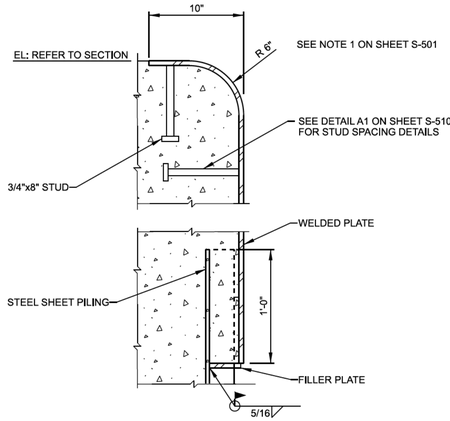
SECTION
MOORING CELL

SHEET ID
SITE 10
S-301

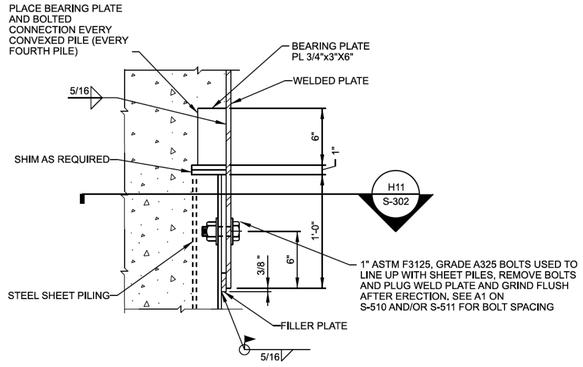
PRE-FINAL SUBMITTAL

SHEET KEYNOTES

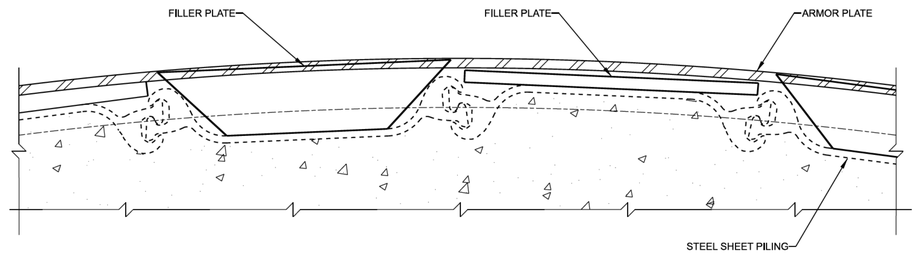
1. FILLER PLATE IS NOT STRUCTURAL. FILLER PLATE IS USED TO SEAL GAPS ALLOWING CONCRETE PLACEMENT.
2. FILLER PLATES TO BE PAINTED USING THE SAME PAINT SYSTEM USED TO COAT THE ARMOR PLATE.



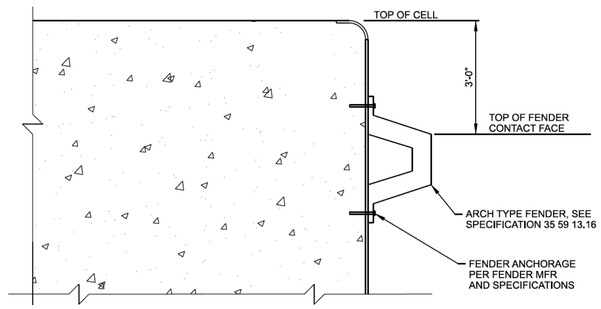
H1 SECTION
SCALE: 3/4"=1'-0" 0 2' 4' 8'



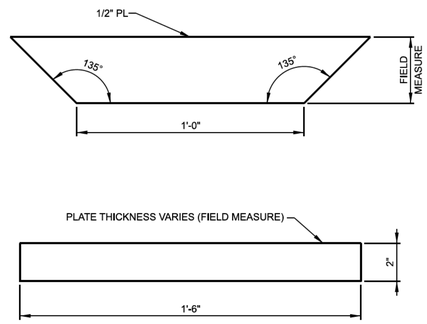
H5 SECTION
SCALE: 3/4"=1'-0" 0 2' 4' 8'



H11 SECTION
SCALE: NTS



A6 SECTION
SCALE: 1/2"=1'-0" 0 1' 2' 4'



A13 FILLER PLATE
SCALE: 1 1/2"=1'-0" 0 6" 1' 2'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE	ISSUE DATE: MAY 2024
DRAWN BY: A. SILVA	SOLICITATION NO.:
CHECKED BY: B. WATSON	CONTRACT NO.:
SUBMITTED BY: R. WELSCH	
SIZE: ANSI D	

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

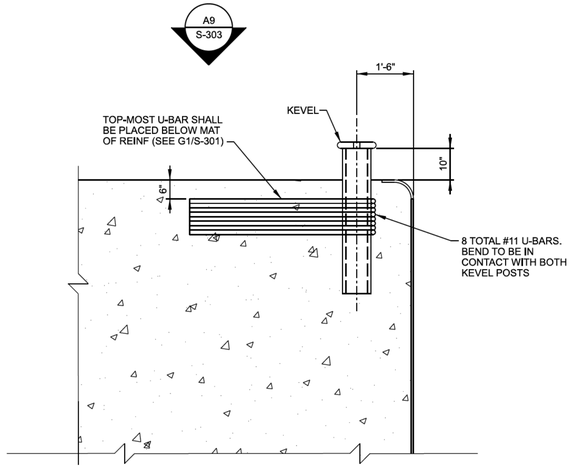
SECTION
MOORING CELL ARMOR

SHEET ID
SITE 10
S-302

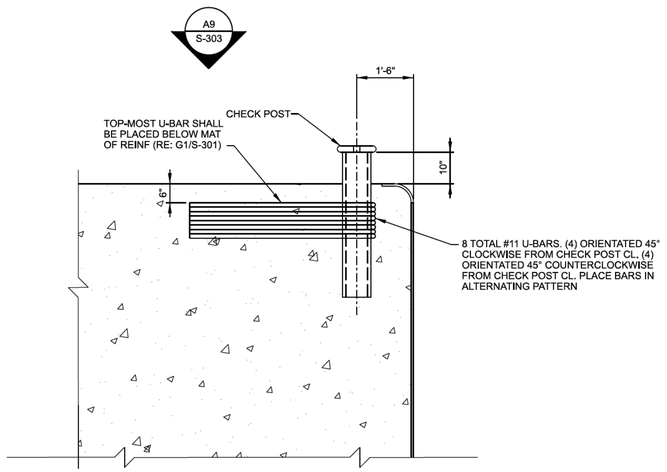
PRE-FINAL SUBMITTAL

GENERAL SHEET NOTES

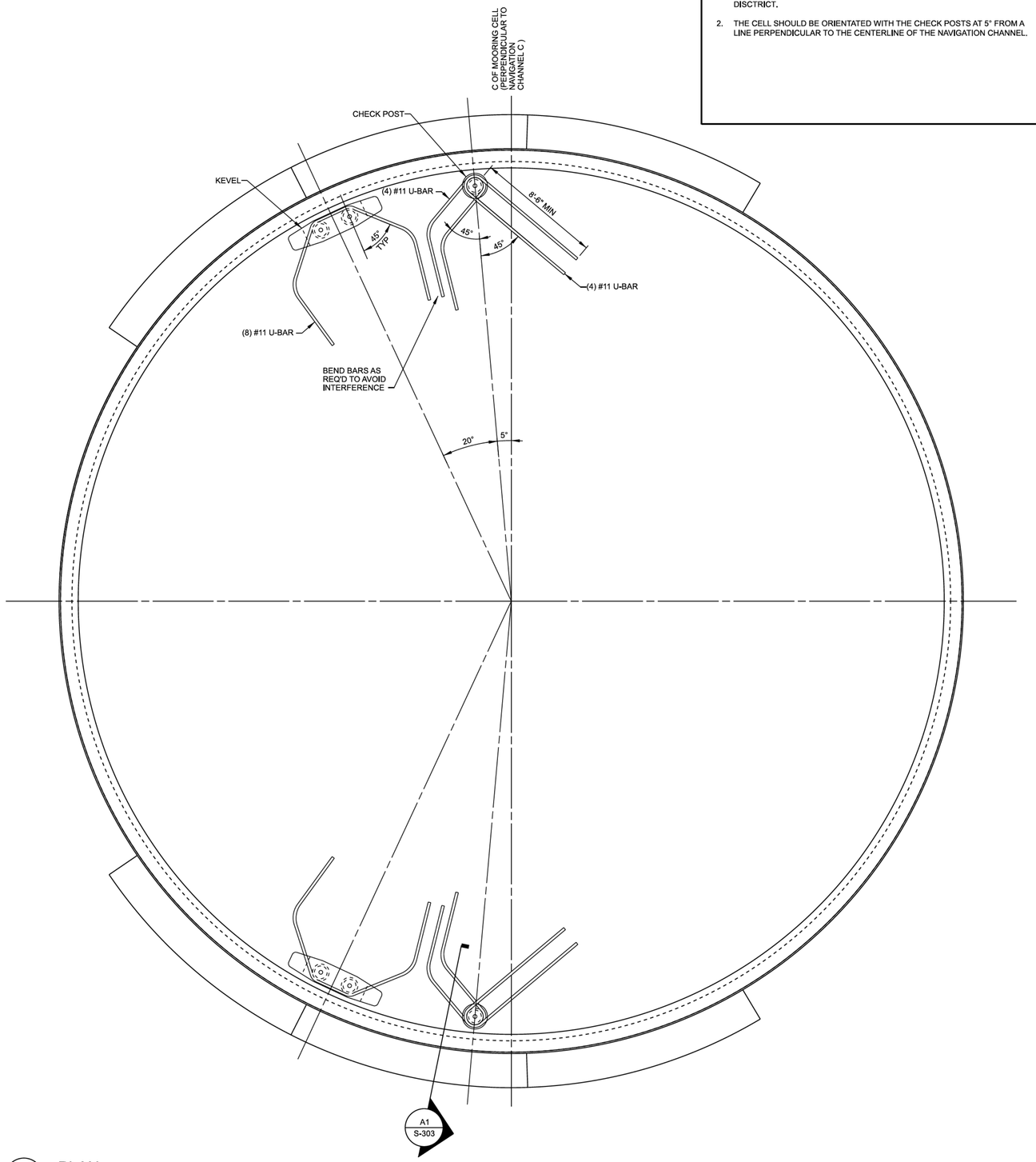
1. EXACT LOCATION OF CELL IS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR, AS APPROVED BY THE CONTRACTING OFFICER AND A REPRESENTATIVE OF THE OPERATIONS DIVISION OF THE ST. PAUL DISCTRICT.
2. THE CELL SHOULD BE ORIENTATED WITH THE CHECK POSTS AT 5° FROM A LINE PERPENDICULAR TO THE CENTERLINE OF THE NAVIGATION CHANNEL.



H1 SECTION - KEVEL
SCALE: 1/2"=1'-0"
0 1' 2' 4'



A1 SECTION - CHECK POST
SCALE: 1/2"=1'-0"
0 1' 2' 4'



A9 PLAN
SCALE: 3/8"=1'-0"
0 2' 4' 8'

MARK	DESCRIPTION	DATE

US Army Corps of Engineers®

DESIGNED BY: A. DUNDEE	ISSUE DATE: MAY 2024
DRAWN BY: A. SILVA	SOLICITATION NO.:
CHECKED BY: B. WATSON	CONTRACT NO.:
SUBMITTED BY:	
SIZE: ANSI D	SCALE:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

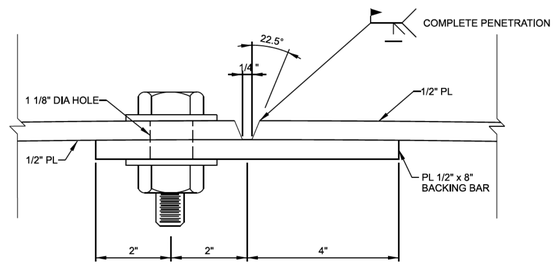
SECTION
ARMORED CHECKPOST

SHEET ID
SITE 10
S-303

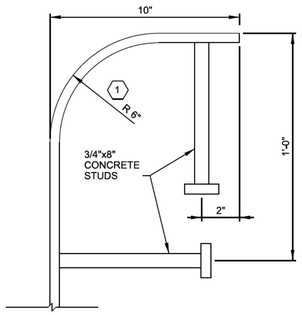
PRE-FINAL SUBMITTAL

SHEET KEYNOTES

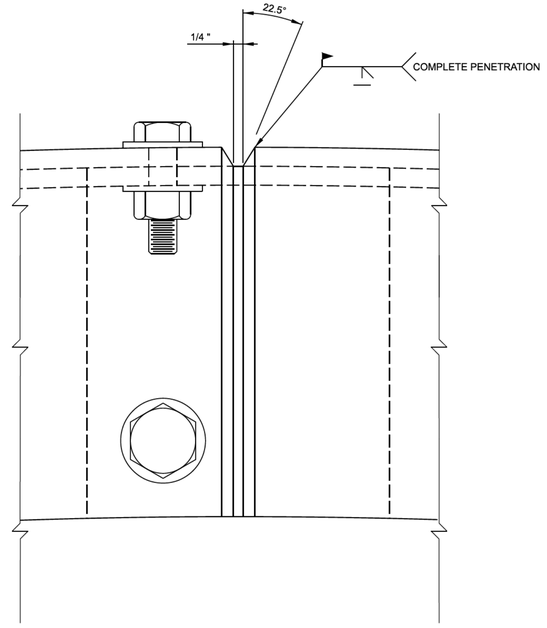
1. IF NECESSARY TO MAKE CORNER BEND (6" RADIUS) CONTRACTOR MAY USE 12" DIAMETER PIPE CUT TO RADIUS OR INCREASE THE BEND RADIUS TO 9" OR OTHER SIMILAR MULTI-PART FABRICATIONS. OUTSIDE RADIUS WELDS WILL NEED TO BE GROUND FLUSH WITH EXTERIOR SURFACE OF ARMOR.



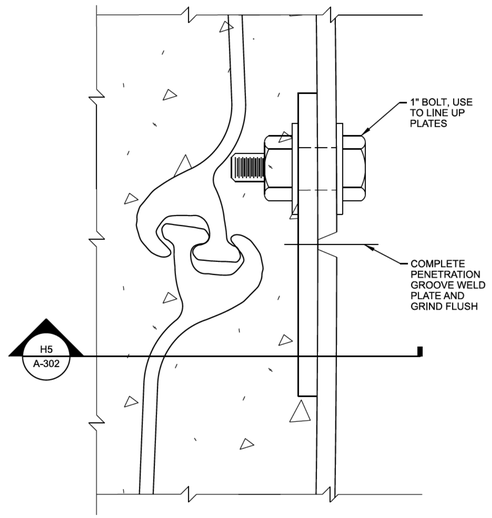
K1 DETAIL
SCALE: 6"=1'-0"



A1 DETAIL - WELDED PLATE CORNER
SCALE: 3"=1'-0"



A8 DETAIL
SCALE: 6"=1'-0"



4 DETAIL
SCALE: 6"=1'-0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

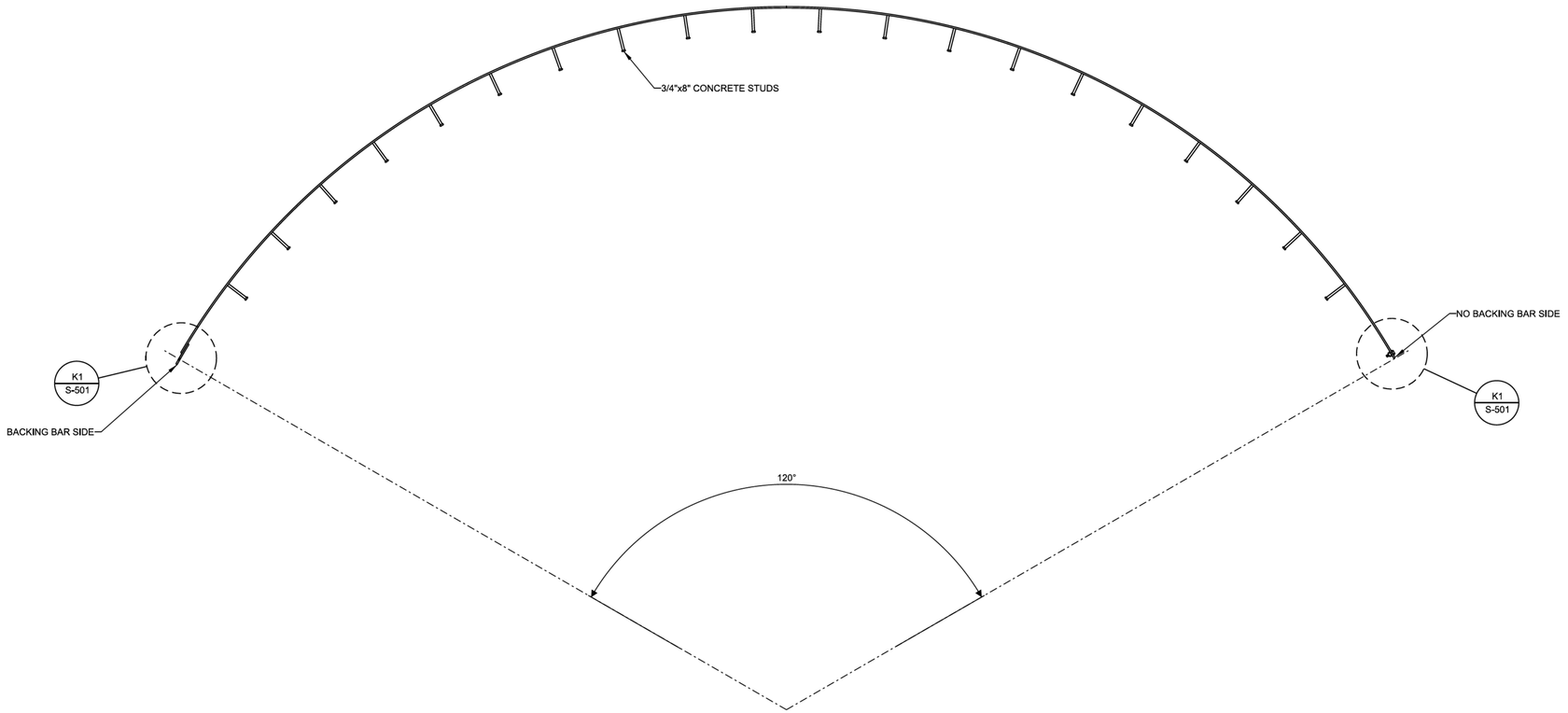
DETAIL
WELDED PLATE

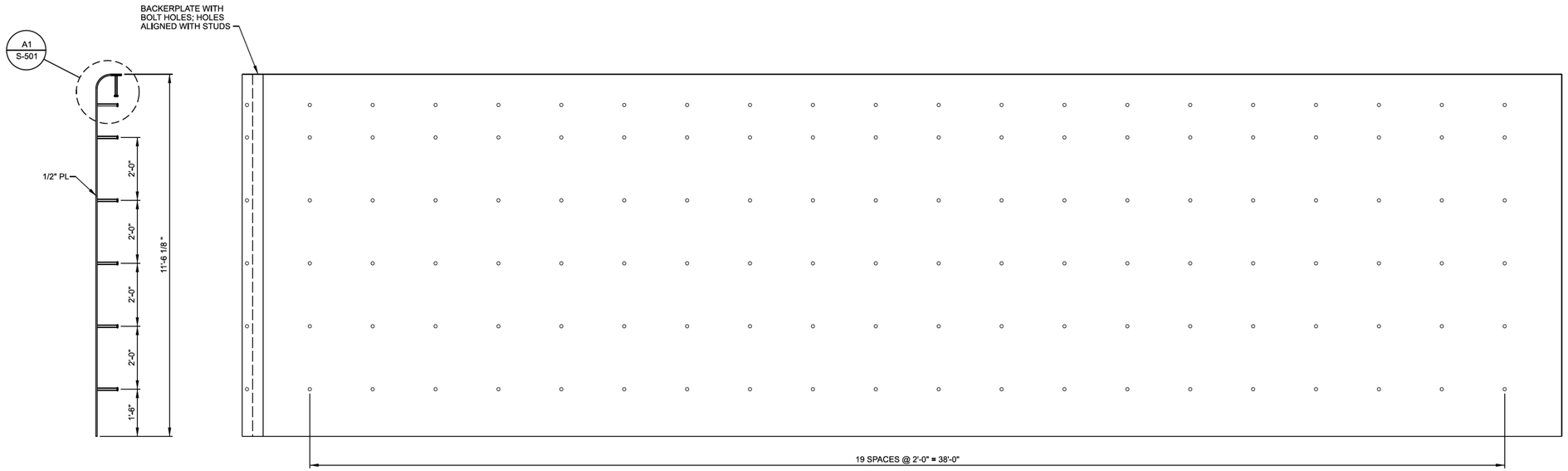
SHEET ID
SITE 10
S-501

PRE-FINAL SUBMITTAL

BILL OF MATERIALS

MARK NO	QTY	DESCRIPTION	MATERIAL
S-510-A1	3	WELDED STUD PLATE	ASTM A36





A1 WELDED PLATE STUD LAYOUT

SCALE: 1/4"=1'-0"

0 2' 4' 8'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: M. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

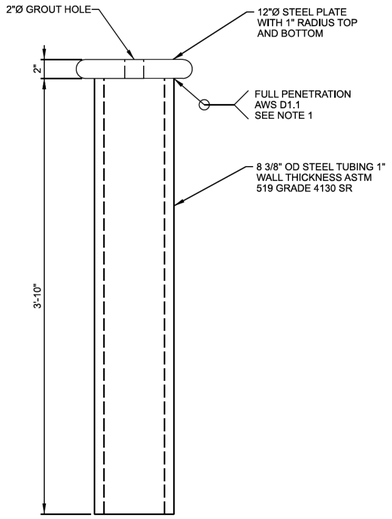
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

DETAIL
WELDED PLATE

SHEET ID
SITE 10
S-510

PRE-FINAL SUBMITTAL



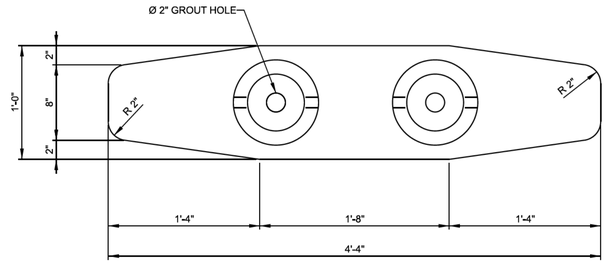
J1 DETAIL - CHECK POST

SCALE: 3/4"=1'-0"

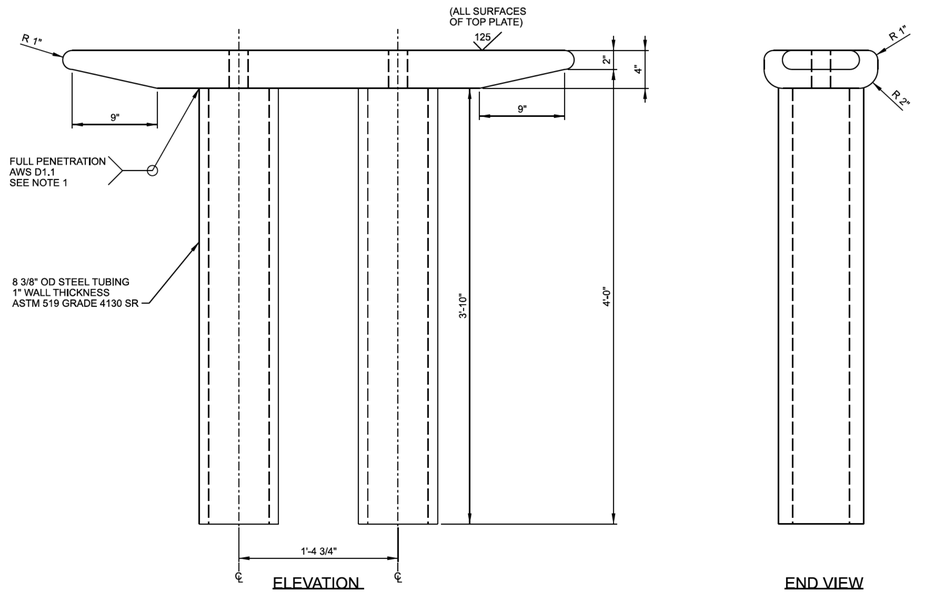
0 1' 2' 4'

GENERAL SHEET NOTES

1. PJP, FULL PENETRATION. 100% MT. USE AWS D1.1 ACCEPTANCE CRITERIA FOR TUBULAR CONNECTIONS.
2. ALL CHECK POSTS AND KEVELS MUST BE FILLED WITH GROUT.



PLAN



ELEVATION

END VIEW

A12 DETAIL - KEVEL

SCALE: 3/4"=1'-0"

0 1' 2' 4'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: R. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

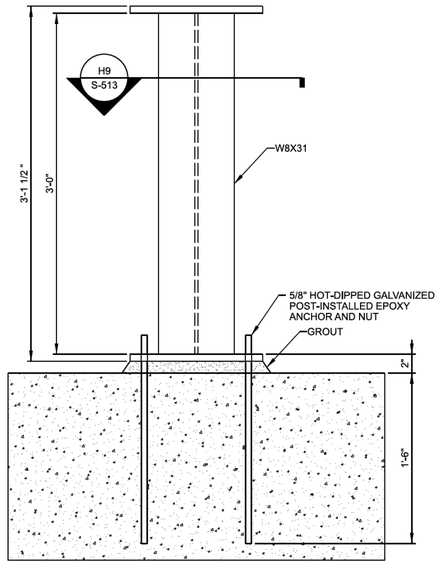
U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

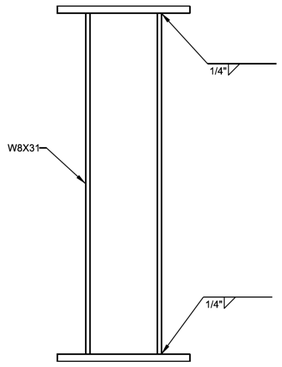
MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

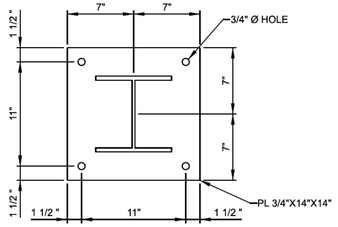
DETAIL
KEVEL AND CHECKPOST

SHEET ID
SITE 10
S-512

PRE-FINAL SUBMITTAL





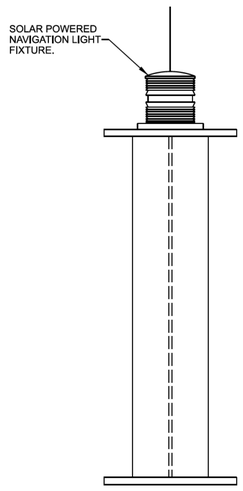


H1 LIGHT STAND
SCALE: 1 1/2"=1'-0"

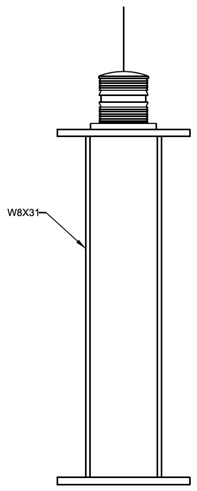
0 6" 1' 2'

H9 LIGHT STAND BASE
SCALE: 1 1/2"=1'-0"

0 6" 1' 2'



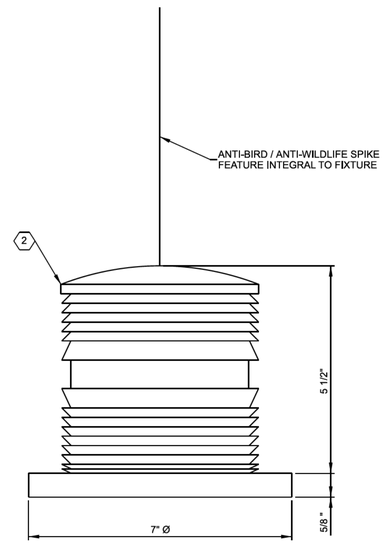
ELEVATION



END VIEW

A1 LIGHT STAND AND LIGHT
SCALE: 1 1/2"=1'-0"

0 6" 1' 2'



A10 DETAIL - LIGHT
SCALE: 6" = 1'-0"

0 1-1/2" 3" 6"

GENERAL SHEET NOTES

1. ALL STEEL SHALL BE ASTM A36 UNLESS OTHERWISE NOTED.
2. HOT-DIP ENTIRE FABRICATED STEEL STAND AFTER COMPLETING ITS ASSEMBLY.
3. ALL ANCHOR BOLTS, MOUNTING BOLTS, WASHERS, AND NUTS MUST BE HOT DIPPED GALVANIZED STEEL.

SHEET KEYNOTES

1. PROVIDE ONE MARINE NAVIGATION LIGHT FIXTURE ATOP NEW FABRICATED STRUCTURAL STEEL STAND.
2. PROVIDE ONE NEW STAND-ALONE, LED STYLE, SOLAR MARINE NAVIGATION LIGHT WITH THE FOLLOWING REQUIREMENTS:
   - POWER SOURCE: INTEGRAL SOLAR POWERED WITH INTEGRAL SOLAR PANEL AND BATTERY(IES)
   - ENVIRONMENT RATING: IP68 (NEMA 4X) OR BETTER
   - COLOR: RED COLOR LIGHT
   - FLASHING: CONTINUOUS, A.K.A. NO FLASHING
   - VISIBLE RANGE: 2 NAUTICAL MILES (NM) MINIMUM IN HORIZONTAL OUTPUT OF 360 DEGREES
   - CONTROL: INTEGRAL DUSK ON-TO-DAWN OFF BY MANUFACTURER
   - SURGE PROTECTION: INTEGRAL PROVIDED BY MANUFACTURER
   - ANTI-WILDLIFE OR ANTI-BIRD SPIKE: INTEGRAL BY MANUFACTURER
   - MATERIALS: NON-FERROUS METALS AND UV STABILIZED POLYCARBONATE
   - BATTERIES: NIMH TYPE, AMP-HOURS SIZED AND DETERMINED BY MANUFACTURER TO PROVIDE NOT LESS THAN THREE (3) DAYS OPERATION WITHOUTH RECHARGING SUNLIGHT
   - ALSO SEE TECHNICAL SPECIFICATIONS SECTION 26 56 00
   - PROVIDE PRODUCT INFORMATION INCLUDING OPERATION AND PERIODIC MAINTENANCE INSTRUCTIONS AS NECESSARY AND AVAILABLE
3. PROVIDE MOUNTING HOLES IN SPECIFIC CUSTOM LOCATIONS TO FACILITATE THE ACTUAL LIGHT FIXTURE PROVIDED. APPLY COLD-GALVANIZING COMPOUND TO ALL FIELD DRILLED, CUT, OR SCATCHED (MARRED) STRUCTURAL STEEL SUPPORT SURFACES. PROVIDE HOT-DIPPED GALVANIZED MOUNTING BOLTS AND HARDWARE TO SECURE THE LIGHT FIXTURE TO THE STEEL STAND.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: A. DUNDEE
DRAWN BY: A. SILVA
CHECKED BY: B. WATSON
SUBMITTED BY: J. WELSCH
SIZE: ANSI D
ISSUE DATE: MAY 2024
SOLICITATION NO.:
CONTRACT NO.:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA 55101

MISSISSIPPI RIVER BASIN
LOCK AND DAM 10
GUTTENBERG, IA
UPSTREAM MOORING CELL

DETAIL
LIGHT STAND AND SOLAR LIGHT

SHEET ID
SITE 10
S-513

PRE-FINAL SUBMITTAL

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

UPPER MISSISSIPPI RIVER
MOORING FACILITIES

POOL 10
CLAYTON COUNTY, IOWA

APPENDIX D

ENDANGERED SPECIES LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To: 10/08/2024 15:32:52 UTC
Project Code: 2024-0040384
Project Name: Pool 10 Mooring Cell

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat, if present, within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) **the accuracy of this species list should be verified after 90 days**. This verification can be completed formally or informally. You may verify the list by visiting the ECOSPHERE Information for Planning and Consultation (IPaC) website https://ipac.ecosphere.fws.gov at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

Section 7 Consultation

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the U.S. Fish and Wildlife Service (Service) if they determine their project “may affect” listed species or designated critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action may affect endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have no effect on threatened or endangered species or their respective designated critical habitat, you do not need to seek concurrence with the Service.

Note: For some species or projects, IPaC will present you with *Determination Keys*. You may be able to use one or

more Determination Keys to conclude consultation on your action.

Technical Assistance for Listed Species

1. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain information on the species life history, species status, current range, and other documents by selecting the species from the thumbnails or list view and visiting the species profile page.

No Effect Determinations for Listed Species

1. If there are *no* species or designated critical habitats on the Endangered Species portion of the species list: conclude "no species and no critical habitat present" and document your finding in your project records. No consultation under ESA section 7(a)(2) is required if the action would result in no effects to listed species or critical habitat. Maintain a copy of this letter and IPaC official species list for your records.
2. If any species or designated critical habitat are listed as potentially present in the **action area** of the proposed project the project proponents are responsible for determining if the proposed action will have “no effect” on any federally listed species or critical habitat. No effect, with respect to species, means that no individuals of a species will be exposed to any consequence of a federal action or that they will not respond to such exposure.
3. If the species habitat is not present within the action area or current data (surveys) for the species in the action area are negative: conclude “no species habitat or species present” and document your finding in your project records. For example, if the project area is located entirely within a “developed area” (an area that is already graveled/paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping, is located within an existing maintained facility yard, or is in cultivated cropland conclude no species habitat present. Be careful when assessing actions that affect: 1) rights-of-ways that contains natural or semi-natural vegetation despite periodic mowing or other management; structures that have been known to support listed species (example: bridges), and 2) surface water or groundwater. Several species inhabit rights-of-ways, and you should carefully consider effects to surface water or groundwater, which often extend outside of a project’s immediate footprint.
4. Adequacy of Information & Surveys - Agencies may base their determinations on the best evidence that is available or can be developed during consultation. Agencies must give the benefit of any doubt to the species when there are any inadequacies in the information. Inadequacies may include uncertainty in any step of the analysis. To provide adequate information on which to base a determination, it may be appropriate to conduct surveys to determine whether listed species or their habitats are present in the action area. Please contact our office for more information or see the survey guidelines that the Service has made available in IPaC.

May Effect Determinations for Listed Species

1. If the species habitat is present within the action area and survey data is unavailable or inconclusive: assume the species is present or plan and implement surveys and interpret results in coordination with our office. If assuming species present or surveys for the species are positive continue with the may affect determination process. May affect, with respect to a species, is the appropriate conclusion when a species might be exposed to a consequence of a federal action and could respond to that exposure. For critical habitat, ‘may affect’ is the appropriate conclusion if the action area overlaps with mapped areas of critical habitat and an essential physical or biological feature may be exposed to a consequence of a federal action and could change in response to that exposure.
2. Identify stressors or effects to the species and to the essential physical and biological features of critical habitat that overlaps with the action area. Consider all consequences of the action and assess the potential for each life stage of the species that occurs in the action area to be exposed to the stressors. Deconstruct the action into its component parts to be sure that you do not miss any part of the action that could cause effects to the species or physical and biological features of critical habitat. Stressors that affect species’ resources may have consequences even if the species is not present when the project is implemented.
3. If no listed or proposed species will be exposed to stressors caused by the action, a ‘no effect’ determination may be appropriate – be sure to separately assess effects to critical habitat, if any overlaps with the action

area. If you determined that the proposed action or other activities that are caused by the proposed action may affect a species or critical habitat, the next step is to describe the manner in which they will respond or be altered. Specifically, to assess whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected."

4. Determine how the habitat or the resource will respond to the proposed action (for example, changes in habitat quality, quantity, availability, or distribution), and assess how the species is expected to respond to the effects to its habitat or other resources. Critical habitat analyses focus on how the proposed action will affect the physical and biological features of the critical habitat in the action area. If there will be only beneficial effects or the effects of the action are expected to be insignificant or discountable, conclude "may affect, not likely to adversely affect" and submit your finding and supporting rationale to our office and request concurrence.
5. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, check IPaC for species-specific Section 7 guidance and conservation measures to determine whether there are any measures that may be implemented to avoid or minimize the negative effects. If you modify your proposed action to include conservation measures, assess how inclusion of those measures will likely change the effects of the action. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, contact our office for assistance.
6. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For additional information on completing Section 7 Consultation including a Glossary of Terms used in the Section 7 Process, information requirements for completing Section 7, and example letters visit the Midwest Region Section 7 Consultations website at: https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance.

You may find more specific information on completing Section 7 on communication towers and transmission lines on the following websites:

- Incidental Take Beneficial Practices: Power Lines - https://www.fws.gov/story/incidental-take-beneficial-practices-power-lines
- Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning. - https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation

Tricolored Bat Update

On September 14, 2022, the Service published a proposal in the Federal Register to list the tricolored bat (Perimyotis subflavus) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. The Service determined the bat faces extinction primarily due to the rangewide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across North America. Because tricolored bat populations have been greatly reduced due to WNS, surviving bat populations are now more vulnerable to other stressors such as human disturbance and habitat loss. Species proposed for listing are not afforded protection under the ESA; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register), the prohibitions against jeopardizing its continued existence and “take” will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require

reinitiation of consultation, and projects with an existing section 10 incidental take permit may require an amendment to provide uninterrupted authorization for covered activities. Contact our office for assistance.

Other Trust Resources and Activities

Bald and Golden Eagles

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, please contact our office for further coordination. For more information on permits and other eagle information visit our website https://www.fws.gov/library/collections/bald-and-golden-eagle-management.
We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

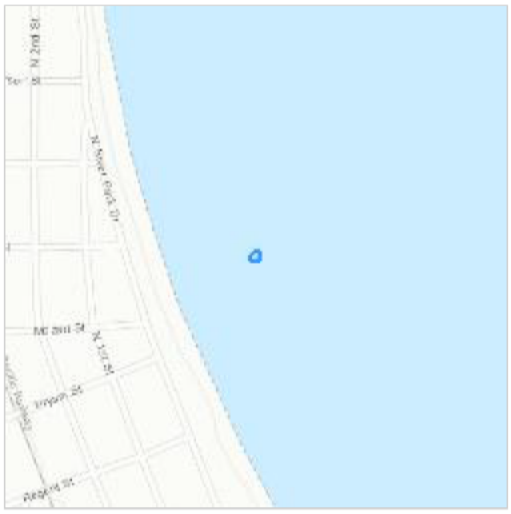
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
(309) 757-5800

PROJECT SUMMARY

Project Code: 2024-0040384
Project Name: Pool 10 Mooring Cell
Project Type: Navigation Channel Improvement
Project Description: Construction and maintenance of a 40ft diameter concrete mooring cell within the navigation channel

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.79136335,-91.097397325,14z



Counties: Clayton County, Iowa

ENDANGERED SPECIES ACT SPECIES

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

CLAMS

NAME	STATUS
Higgins Eye (pearlymussel) *Lampsilis higginsii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5428	Endangered
Salamander Mussel *Simpsonaias ambigua* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6208	Proposed Endangered
Sheepnose Mussel *Plethobasus cyphyus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6903	Endangered
Spectaclecase (mussel) *Cumberlandia monodonta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Eastern Prairie Fringed Orchid *Platanthera leucophaea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/601	Threatened
Northern Wild Monkshood *Aconitum noveboracense* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1450	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

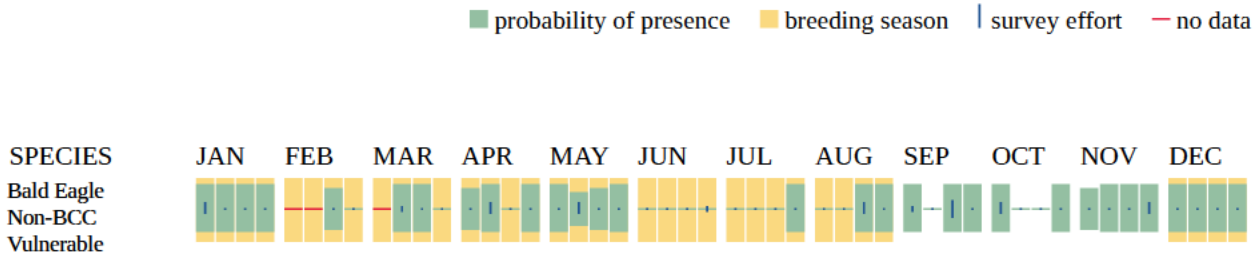
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9643	Breeds May 20 to Aug 10
Cerulean Warbler *Setophaga cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 22 to Jul 20
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25

NAME	BREEDING SEASON
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Henslow's Sparrow *Centronyx henslowii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3941	Breeds May 1 to Aug 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

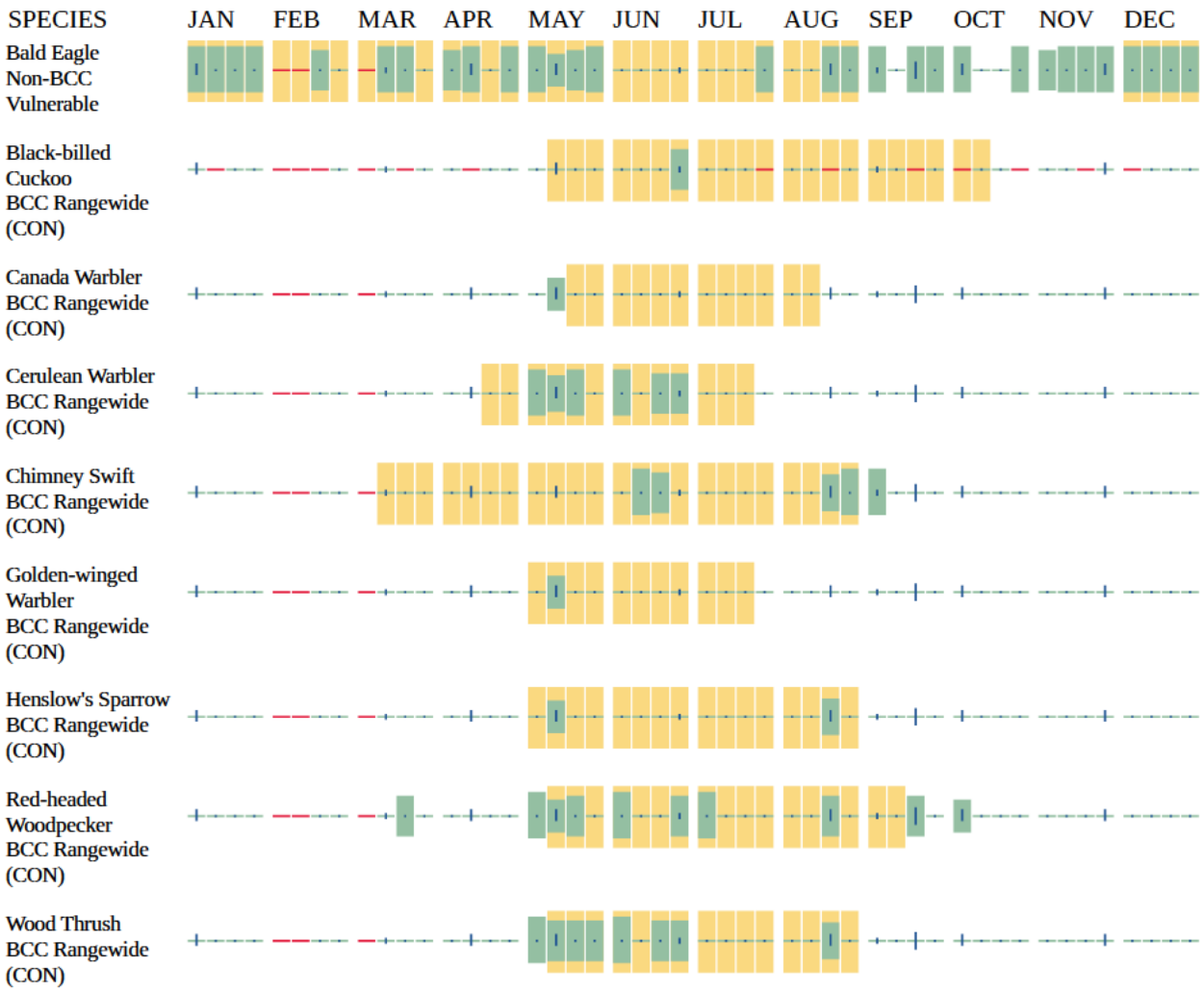
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort – no data



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R2UBH

IPAC USER CONTACT INFORMATION

Agency:	Army Corps of Engineers
Name:	Lewis Wiechmann
Address:	332 Minnesota Street
Address Line 2:	Suite E 1500
City:	St. Paul
State:	MN
Zip:	55101
Email	[redacted]
Phone:	[redacted]

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To:
Project code: 2024-0040384
Project Name: Pool 10 Mooring Cell

January 24, 2024

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Record of project representative's no effect determination for 'Pool 10 Mooring Cell'

Dear Lewis Wiechmann:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on January 24, 2024, for 'Pool 10 Mooring Cell' (here forward, Project). This project has been assigned Project Code 2024-0040384 and all future correspondence should clearly reference this number. **Please carefully review this letter.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project has reached the determination of "No Effect" on the northern long-eared bat. To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A

consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17).

Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no consultation with the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13].

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Eastern Prairie Fringed Orchid *Platanthera leucophaea* Threatened
- Higgins Eye (pearlymussel) *Lampsilis higginsii* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate
- Northern Wild Monkshood *Aconitum noveboracense* Threatened
- Salamander Mussel *Simpsonaias ambigua* Proposed Endangered
- Sheepnose Mussel *Plethobasus cyphyus* Endangered
- Spectaclecase (mussel) *Cumberlandia monodonta* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may affect the animal species listed above and, if so, how they may be affected.

Next Steps

Based upon your IPaC submission, your project has reached the determination of “No Effect” on the northern long-eared bat. If there are no updates on listed species, no further consultation/ coordination for this project is required with respect to the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place to ensure compliance with the Act.

If you have any questions regarding this letter or need further assistance, please contact the Illinois-Iowa Ecological Services Field Office and reference Project Code 2024-0040384 associated with this Project.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

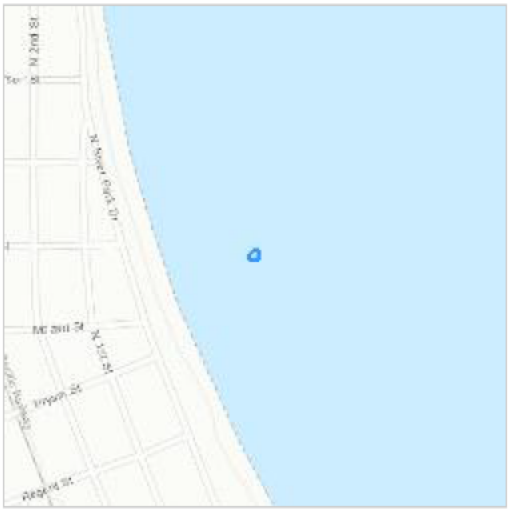
Pool 10 Mooring Cell

2. Description

The following description was provided for the project 'Pool 10 Mooring Cell':

> Construction and maintenance of a 40ft diameter concrete mooring cell within the navigation channel

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.79136335,-91.097397325,14z



DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the Endangered northern long-eared bat (Myotis septentrionalis). Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for those species.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

   Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

   No

3. Does any component of the action involve construction or operation of wind turbines?

   Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Yes

5. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   No

6. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   Yes

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   No

8. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   No

9. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the effects of any activities that would not occur but for the proposed action.

   If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer “No” below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project’s action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a “no effect” determination for the northern long-eared bat.

   Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer “No” and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of Effects of the Action can be found here: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

   Yes

PROJECT QUESTIONNAIRE

Will all project activities by completed by April 1, 2024?

No

IPAC USER CONTACT INFORMATION

Agency:	Army Corps of Engineers
Name:	Lewis Wiechmann
Address:	332 Minnesota Street
Address Line 2:	Suite E 1500
City:	St. Paul
State:	MN
Zip:	55101
Email	[redacted]
Phone:	

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

UPPER MISSISSIPPI RIVER
MOORING FACILITIES

POOL 10
CLAYTON COUNTY, IOWA

APPENDIX E

BIOLOGICAL OPINION

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Ecological Services
Minnesota-Wisconsin Field Office
4101 American Boulevard East
Bloomington, Minnesota 55425-1665
Phone: (952) 858-0793 Fax: (952) 646-2873

November 29, 2024

In Reply Refer To:
IPaC Project Code: 2024-0040384

Jonathan Sobiech
Deputy Chief, Regional Planning and Environment Division North
U.S. Army Corps of Engineers, St. Paul District
332 Minnesota Street, Suite E1500
St. Paul, MN 55101-1323

Subject: Biological Opinion for a Mooring Cell at Lock and Dam 10, Mississippi River Pool 10, Clayton County, Iowa

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) and is based on our review of the proposed Mooring Cell Project (Project) on the Mississippi River in Clayton County, Iowa, with potential effects to Higgins' eye pearlymussel (*Lampsilis higginsii*). A Biological Assessment and email requesting formal consultation were received in our office on August 14, 2024.

This biological opinion is based on the best available scientific and commercial data including meetings, electronic mail, and telephone correspondence with the Corps and consultants as well as from Service files, pertinent scientific literature, discussions with recognized species authorities, and other scientific sources. A complete administrative record is on file at the Minnesota-Wisconsin Ecological Services Field Office.

The enclosed BO addresses effects of the project on the federally endangered Higgins eye. After reviewing the status and environmental baseline of the species and conducting an analysis of the potential effects of the proposed project to the species, the Service concludes that project activities are not likely to jeopardize the continued existence of Higgins eye. This BO provides a statement of anticipated incidental take resulting from the project along with avoidance and minimization measures.

Please contact the Service if the project changes or if new information reveals effects of the

proposed action to proposed or listed species to an extent not covered in your biological assessment or analyzed in this BO. If you have any questions or comments on this BO, please contact Nick Utrup, Fish and Wildlife Biologist, at (612) 600-6122, or via email at *nick_utrup@fws.gov*.

Sincerely,

Robert W. Tawes
Field Supervisor

Encl

BIOLOGICAL OPINION

Effects to Higgins eye from the Placement and Construction of a Mooring Cell Located in Pool 10 of the Mississippi River, Clayton County, Iowa

IPaC Project Code: 2024-0040384

Prepared by:
U.S. Fish and Wildlife Service
Minnesota-Wisconsin Field Office

November 29, 2024

Table of Contents

INTRODUCTION

This Biological Opinion (BO) was issued to the U.S. Army Corps of Engineers (Corps) by the U.S. Fish and Wildlife Service (Service) and analyzed the effects to federally listed species described by the Biological Assessment (BA) for the construction of a 40ft mooring cell above Lock and Dam 10 in the Mississippi River, a proposed project located in Clayton County, Iowa. The BA was received at the Service's Minnesota-Wisconsin Ecological Services Field Office on August 14, 2024 with a letter requesting us to initiate formal consultation on potential adverse effects to the federally endangered Higgins eye pearlymussel (*Lampsilis higginsii*). This site-specific consultation under Section 7of the Endangered Species Act was used to address the proposed project and analyze the direct, indirect, and cumulative impacts from the project on Higgins eye. The Service concluded that the effects of the proposed Project are not likely to jeopardize the continued existence of Higgins eye. No critical habitat is designated for the species.

This biological opinion was prepared in accordance with Section 7(a)(2) of the Endangered Species Actof 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) and is the culmination of formal Section 7 consultation under the Act. The purpose of formal Section 7 consultation is to ensure that any action authorized, funded, or carried out by the Federal government is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any officially designated critical habitat of such species. This biological opinion satisfies the Section 7(a)(2) consultation requirement for Federal agencies. A complete administrative record is available at the Minnesota-Wisconsin Field Office.

CONSULTATION HISTORY

Per Section 7 of the ESA, the Corps and the Service entered into a programmatic consultation on the systematic impacts of implementing the recommended plan described in the Integrated Feasibility Report and Programmatic Environmental Impact Statement (EIS) for the Upper Mississippi River-Illinois Waterway System Navigation Feasibility Study (USACE, 2004). This consultation utilized a tiered consultation framework with the consultation resulting in a Tier I Biological Opinion that evaluated the effects to listed species at the program or ecosystem level. Subsequent site-specific projects require Tier II consultations with Tier II biological opinions issued as appropriate (i.e., whenever the proposed project will result in unavoidable adverse effects to threatened and endangered species). This is a Tier II Biological Opinion for the site-specific construction of a 40ft mooring cell above Lock and Dam 10 in the Mississippi River under the NESP Tier I Programmatic Biological Opinion.

Per the Terms and Conditions in the Tier I Biological Opinion from 2004, the Corps has implemented all Reasonable and Prudent Measures (RPM) to minimize take of Higgins eye as outlined in the Tier I BO within their Tier II Biological Assessment. The RPMs include review of suitability of aquatic habitat for Higgins eye within the project area, as well as conducting site specific mussel surveys which are described Section 3.1.8 of the BA. The Corps has also incorporated general conservation measures outlined in Section 2.5 as well as Higgins eye specific conservation measures which are described in Section 4.1.1 of the BA. Attachment D of the BA includes the specific language of the 2004 Biological Opinion Terms and Conditions for Higgins eye along with the Corps description of how the Terms and Conditions have been met. Table 1 includes the consultation history specific to this BO.

Table 1. Consultation history

DATE	MEETING/SUBMITTAL
AUGUST, 2004	NESP Programmatic Tier I Biological Opinion
OCTOBER, 2023	Mussel survey
MAY 21, 2024	Initial draft of the proposed project and draft biological assessment
JUNE 26, 2024	USFWS comments submitted on draft biological assessment
JUNE 26, 2024	Call regarding draft Biological Assessment and project modifications
AUGUST 14, 2024	Biological Assessment received by USFWS

BIOLOGICAL OPINION

PROPOSED ACTION

Section 7(a)(2) of the Endangered Species Act requires that Federal agencies shall insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any threatened or endangered species, or result in the destruction or adverse modification of critical habitat. When the actions of a Federal agency may adversely affect a protected species, that agency (i.e., the action agency) is required to consult with either the National Marine Fisheries Service (NMFS) or the Service, depending upon the protected species that may be affected.

The Federal action evaluated in this Biological Opinion (BO) is a Federal permit issued by the Corps for the proposed construction of a 40ft mooring cell above Lock and Dam 10 in the Mississippi River (Project), between River Miles 615.4 and 615.5, for downbound tows awaiting passage through the lock, which is located in Clayton County, Iowa.

The Service is issuing this BO pursuant to Section 7 of the Endangered Species Act of 1973. Direct and indirect effects of Federal actions and their interrelated or interdependent activities are analyzed to ensure they are not likely to jeopardize the continued existence of federally listed or proposed endangered or threatened species. Indirect effects of the Federal actions include, "…effects that are caused by or result from the action, are later in time but are reasonably certain to occur…" Interdependent actions have no independent utility apart from the proposed action, and interrelated actions are part of a larger action and depend on the larger action for their justification (50 CFR §402.02).

Project Description

Lock and Dam 10 in Clayton County Iowa sees a large volume of navigation traffic each year during the navigation season (early spring to late fall), consisting primarily of barge traffic and some recreation.

The purpose of the proposed mooring cell project is to improve navigation efficiency on the upper side of Lock and Dam 10 between River Miles 615.4 and 615.5 for downbound tows awaiting passage through the lock (Figure 1 and Figure 2). Under present conditions, towboats must move in close to shore and ground their barges and/or maintain engine power within the area to hold position. With a mooring cell at the proposed location, towboats could tie off to the structure and minimize sediment re-suspension and river substrate disturbance by allowing their engines to run at idling speed or off. Access or maintenance dredging are not required or proposed as part of this project.

This project is part of a larger effort to improve navigation efficiencies throughout the Upper Mississippi River from pools 7 to 22. The effort includes eight mooring cell locations at various locks and dams but this is the only location with potential for adverse effects on endangered species. Given the likelihood of the federally endangered Higgins eye (*Lampsilis higginsii*) occurring in the Action Area of the proposed mooring cell above Lock and Dam 10 and the potential to be impacted from the Project, the Corps contracted for a mussel survey during October 2023 (see Attachment C of the BA). The results show a mussel community containing Higgins eye along the Navigation Channel border. It's likely Higgins eye occurs within the mooring cell footprint and would be impacted by the installation of the structure.

Figure 1. Project Location

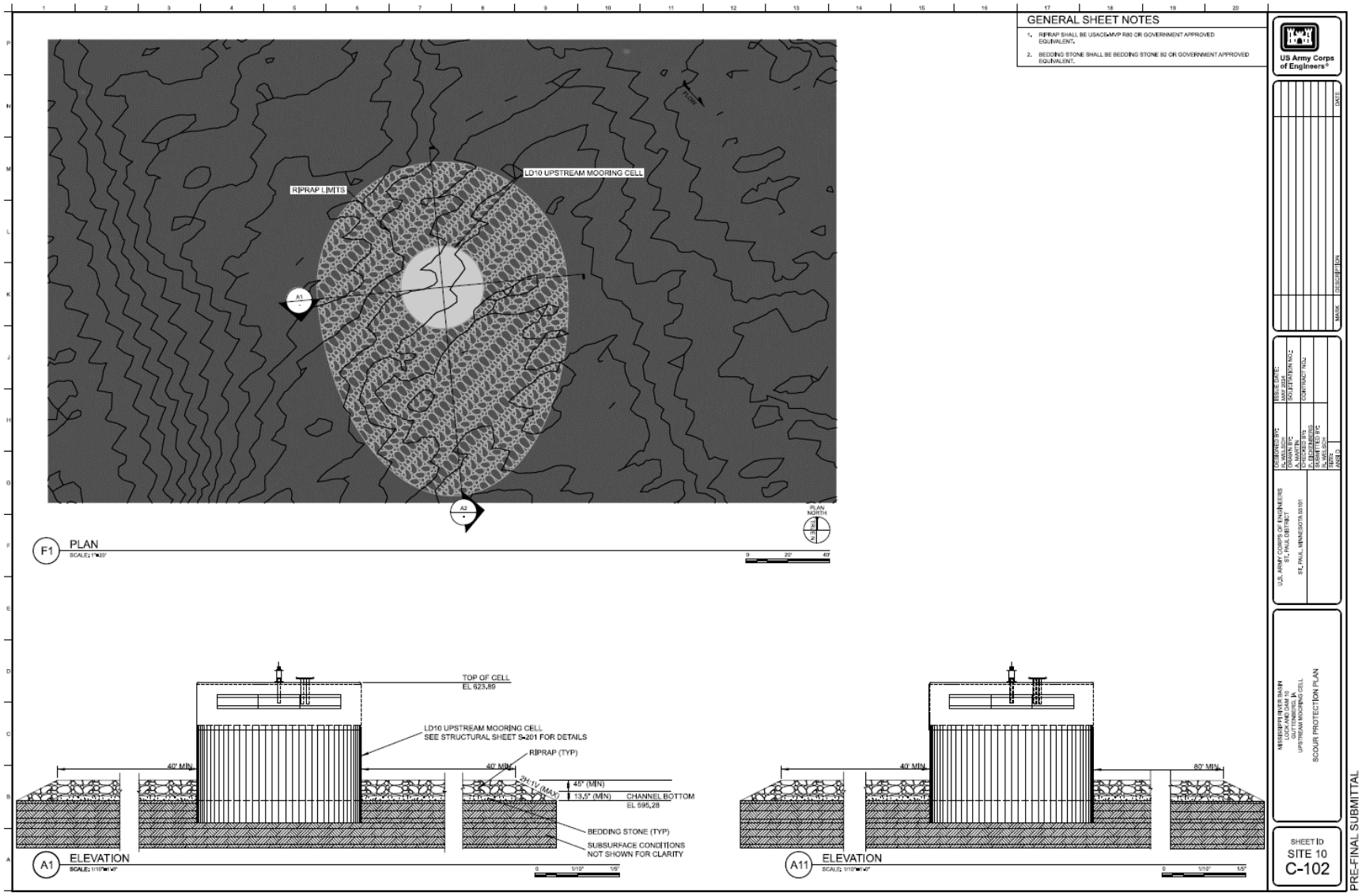


Figure 2. Schematic of the proposed mooring cell at river mile 615.5

Action Area

The action area includes the in-water footprint of the cell, the assumed locations of where work barges will operate, and the approach and departure routes of barges that will ultimately use the cell for mooring while waiting to lock through Lock and Dam 10 (Figure 3). The mooring cell is proposed to be placed approximately 500 meters (0.3 miles) directly above Lock and Dam 10 and along the right descending bank. The area in which construction would occur and where barges would approach and depart as well as be moored after construction is within depths required for the 9-ft Navigation Channel and undergoes periodic channel maintenance to maintain those depths. The aquatic area identified to evaluate project impacts to native mussels including Higgins eye are within the main navigation channel of UMR Pool 10.

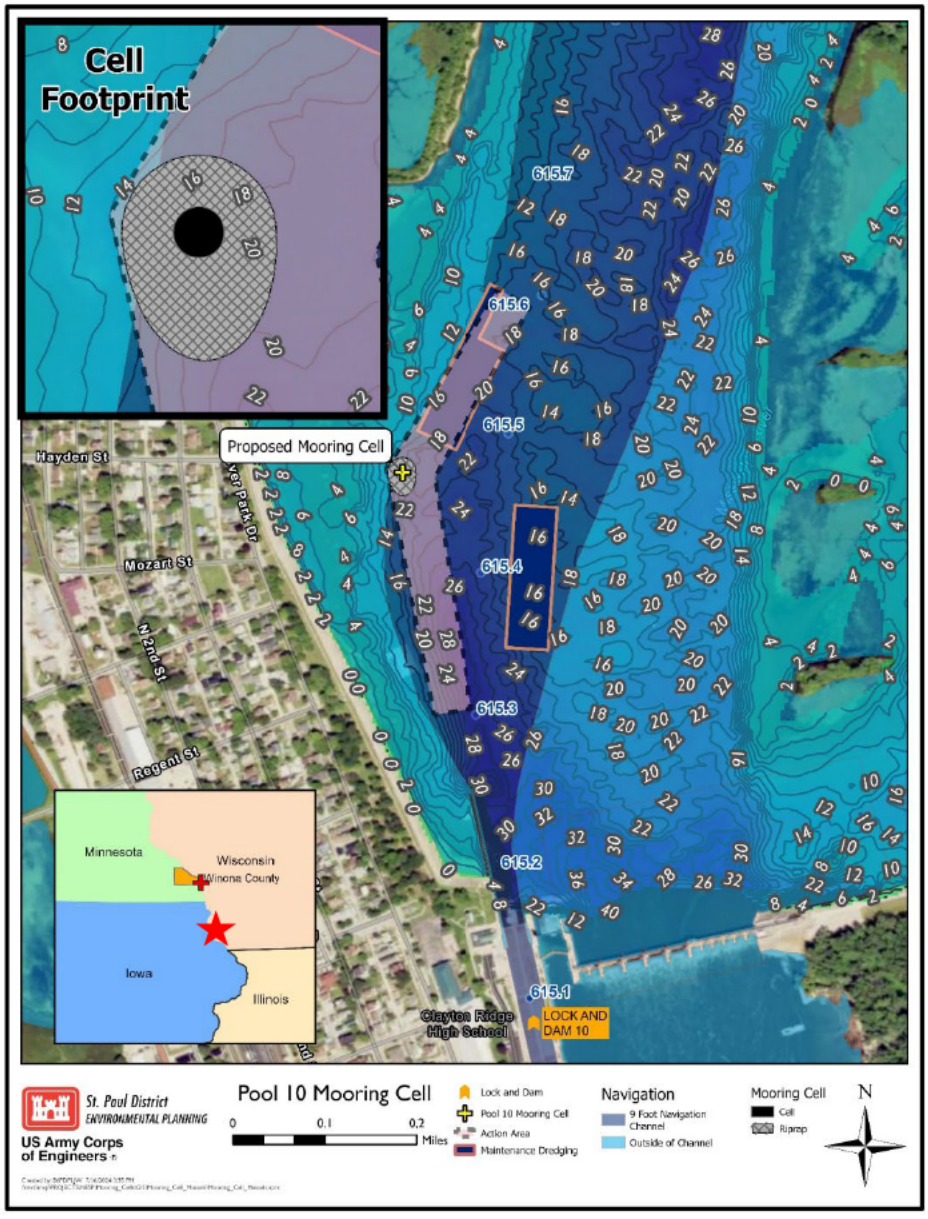


Figure 3. Action Area Map

Current Operations and Maintenance Practices

The Action Area is within a navigable area with depths required for the maintained 9-ft navigation channel project. The area is periodically dredged for navigation, the most recent of which was done in 2018 immediately upstream from the proposed mooring cell placement. Currently barges and tows occasionally ground to shore while awaiting passage through the lock causing sediment resuspension and damage to benthic habitats. While resuspension is not a direct cause for maintenance, maintenance dredging is conducted within the maintained navigation channel to keep a depth that allows for navigation traffic (Figure 2).

Proposed Action

The purpose of the project is to improve navigation efficiencies for downbound tows waiting lockage. The plan is to construct an approximately 40ft wide diameter concrete mooring cell to allow for barges to tie off while awaiting passage through Lock and Dam 10 as well as place rock around the base of the structure to protect the foundation from potential scour. The in-water footprint of the constructed features (mooring cell and rock base armor) would have an area of 1,616.4m2 (Mooring cell, 114.2m2 and scour protection, 1,502.2m2) or 0.40 acres. Other locations for the cell were considered by the Corps during the initial planning of the project through research of where tows are stationary for a long period within the pool. This location was selected through that study and examining the practicability and usability of a cell by the navigation industry. This location provides the best location for a mooring cell as downbound tows will be able to wait for upbound tows to lock through out of the way of upcoming traffic while still being able to quickly get to the lock once the upbound tow has passed.

Construction

All construction would occur within areas and depths authorized for the navigation channel. The construction area work limits will consist of the mooring cell footprint and the footprint of scour protection. Barges will be used for transporting and as a platform for heavy equipment to work from and to stage materials. The proposed mooring cell would be constructed out of steel sheet piling, rock aggregate and concrete. Approximately 2ft of soil and rock would be excavated within the proposed mooring cell footprint and 5ft beyond. Sheet pile, with armor steel attached to the top, would be driven approximately 5ft into the riverbed. The sheet pile and armoring would be filled with aggregate and concrete. Check posts and kevels would be installed on the top of the proposed mooring cell as well as a navigation light located at the center of the cell. Just below the top of the cell, and in the area where the check posts and kevels are located, arch-type fenders would be installed. Riprap (ILDOT RR3 or government approved equivalent) would be placed around the base to protect the foundation from potential scour. Duration of construction is likely to occur over one or two construction seasons (generally April to November).

Conservation Measures

The following conservation measures (CM) were described in the BA and would be implemented by the Corps to avoid and minimize impacts to *Higgins eye.*

CM-1: The construction work limits will be the minimal area necessary to complete the Proposed Project and will be specified in the construction plans. Prior to construction, exclusion zones will be established and monitored within the Action Area to delineate avoidance areas for the contractor. Construction limits will be clearly marked with high visible markers or barriers. Construction personnel will strictly limit their activities, vehicles, equipment, and construction materials to

within the confines of the designated construction limits.

CM-2: Best management practices associated with Corps Nationwide Permit 25 and the State of Iowa's Section 401 water quality certification will be required of the contractor to minimize in-water stream bed disturbance when constructing the stream bank protection feature.

CM-3: Prior to construction activities, the Corps designated project biologist will conduct pre-construction environmental briefing for all construction crew members. The briefing will focus on required avoidance/minimization measures and conditions of regulatory agency permits and approvals. The briefing will also include a summary of sensitive species and habitats potentially present within and adjacent to the Action Area.

CM-4: Invasive species prevention. Invasive species, , particularly zebra mussels, have had documented adverse effects to mussels, including Higgins eye. Prior to transportation along roads into or out of the worksite, or between water bodies within the project area, all equipment must be free of any aquatic plants, water, and prohibited invasive species including zebra mussels.

- The Contractor shall clean each previously used piece of construction equipment and watercraft prior to bringing it onto the project site and prior to removing it from the site to prevent the spread of invasive species.
- The Contractor shall ensure that the equipment and watercraft is free from soil residuals, egg deposits from plant pests, noxious weeds, plant seeds, aquatic plants and animals (including zebra mussels), and residual water.
- Cleaning of equipment and watercraft shall be in accordance with the Environmental Protection Plan submitted by the Contractor and approved by the Corps.
- If construction equipment or watercraft brought to the project site is found to be contaminated with invasive species, despite implementation of Best Management Practices, the Contractor shall not use the construction equipment or watercraft in its present state.
- Any contaminated construction equipment or watercraft in water shall immediately be placed on dry land.
- The Contractor shall follow decontamination protocols as identified in the environmental protection plan.
- Contaminated equipment shall be decontaminated on site if there is an area that meets decontamination protocols.
- If this is not possible, the equipment shall be quarantined on site until a decontamination plan is approved by the Contracting Officer.
- Such equipment shall not be used on site until all invasives have been removed and documentation verifying the results of the cleaning is provided.

CM-5: All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances will occur in designated non-sensitive upland areas. These areas will implement best management practices to prevent runoff carrying toxic substances from entering the Mississippi River and associated drainages. If a spill occurs outside of a designated area, the cleanup will be immediate and documented.

CM-6: Contractor access to the site will only be allowed via the authorized 9-ft Channel designated navigation channel limits. No access dredging or staging will be allowed outside of the designated navigation channel.

CM-7: Mussels, including Higgins eye, will be removed out of the construction work limits and placed

within favorable habitat containing an existing mussel bed, within the area adjacent to adjacent to the action area along the Iowa side of the navigation channel, away from any future navigation related disturbances. The relocation would be conducted as close to the construction timeline as possible (≤ 60 days) to avoid mussels recolonizing areas prior to construction.

Federally Listed Species in the Action Area

An official species list was requested from the Information for Planning and Consultation (IPaC) web portal on August 9, 2024. The IPaC results list four endangered species, two threatened species, two proposed endangered species and one candidate species and no critical habitat as potentially occurring within the Action Area (Table 2). However, only one of the species, Higgin eye (*Lampsilis higginsii*), currently occupies the Action Area and has the potential to be adversely affected by the proposed action. Effects determinations for the remaining species are briefly discussed below but are not considered further in this BO.

Table 2. Federally listed species and habitats within the Action Area, as identified using IPaC. Gray highlighted cells indicate those species and habitats covered by this Biological Assessment.

Species Common Name (Scientific Name)	Status	Likelihood in Action Area	Effect Determination
Northern long-eared bat (*Myotis septentrionalis)*	Endangered	Medium	No Effect
Tricolored bat (*Perimyotis subflavus*)	Proposed Endangered	Medium	No Jeopardy (No Effect)
Higgins eye (*Lampsilis higginsii*)	Endangered	Present	May affect, likely to adversely effect
Sheepnose mussel (*Plethobasus cyphyus*)	Endangered	Low	No Effect
Spectaclecase (*Cumberlandia monodonta*)	Endangered	Low	No Effect
Salamander mussel *(Simpsonaias ambigua)*	Proposed Endangered	Low	No Jeopardy (No Effect)
Monarch butterfly (*Danaus plexippus*)	Candidate	Low	No Effect
Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)	Threatened	Low	No Effect
Northern Wild Monkshood *(Aconitum noveboracense)*	Threatened	Low	No Effect

Effect Determinations for Species Not Addressed in this BO

Sheepnose

Suitable habitat for sheepnose (*Plethobasus cyphyus*) is typically found in shallow areas of large rivers and streams that contain moderate to swift currents with substrate containing coarse sand and gravel. The only confirmed fish host for this species is the sauger (*Sander canadensis*). Sheepnose are found rarely within Pool 10 of the Upper Mississippi River (UMR) and have not been found within lower Pool 10 for many decades (Kelner 2024). During 2023 mussel surveys, sheepnose mussels were not found within the Project area or project footprint (EnviroScience 2024).

Spectaclecase

Suitable habitat for spectaclecase (*Cumberlandia monodonta*) is typically within large rivers in areas where they are sheltered from the main force of the river currents. Typically, this species is clustered in firm mud and sheltered areas such as rock, riprap, rock slabs or between boulders. The fish hosts for this species are mooneye (*Hiodon tergisus*) and goldeye (*H. alosoides*). Spectaclecase are found rarely within Pool 10 of the UMR and have not been found within lower Pool 10 for many decades (Kelner 2024). During 2023 mussel surveys, spectaclecase mussels were not found within the Project area or project footprint (EnviroScience 2024).

Salamander mussel

Salamander mussels are small, thin-shelled mussels that inhabit swift-flowing rivers where they shelter under rocks or in crevices. Similar to other freshwater mussels, the salamander mussel relies on a host for reproduction. The mudpuppy (*Necturus maculosus*), the only host for salamander mussel, is a fully aquatic salamander species that is present within the same habitat preferred by the salamander mussel during the summer and fall when female mudpuppies are guarding their nests under large flat rocks. The salamander mussel's larvae (called glochidia) develop on the gills of the mudpuppy before falling off into the stream substrate. Salamander mussels have not been found within lower Pool 10 for many decades, and during 2023 mussel surveys were not found within the Project area or project footprint (EnviroScience 2024).

The Project would have no effect[1] on spectaclecase, sheepnose, or salamander mussel and will not jeopardize the salamander mussel as these species have not been found in lower Pool 10 in several decades and were not found during the 2023 mussel survey (Kelner 2024, EnviroScience 2024).

Northern long-eared bat

The Northern long-eared bat (NLEB) is a medium-sized bat that hibernates in caves and mines in the winter and in the summer roosts singly or in colonies under the bark or in cracks and crevices of trees. NLEB is relatively widespread, and USFWS lists NLEB as a threatened species because a fungal pathogen causing white-nose syndrome is sharply reducing populations. The Corps initiated informal consultation with USFWS via the Northern Long-eared Bat Rangewide Determination Key (DKey) on January 24, 2024, concluding that the project would have no effect the NLEB (Attachment B). Pursuant to the established consultation procedures for NLEB, USFWS had 15 days to verify this determination, after which concurrence can be presumed.

Tricolored bat

The tricolored bat is one of the smallest bats native to North America. During the winter, tricolored bats are found in caves and mines. During the spring, summer and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves. Female tricolored bats exhibit high site fidelity, returning year after year to the same summer roosting locations. Female tricolored bats form maternity colonies and switch roost trees regularly whereas, males roost singly. The proposed action will have no effect on and will not jeopardize[2] the tricolored bat.

Monarch

[1] No jeopardy determination for the salamander mussel is due to species only being proposed for listing vs. No effects determination which is for listed species. However, the Corps determined there would be no effect on salamander mussel if it were listed.

[2] No jeopardy determination is due to species only being proposed for listing vs. No effects determination which is for listed species. However, the Corps has determined the proposed action would have no effect on the species if it were listed.

Monarch butterflies are large and conspicuous, with bright orange wings surrounded by a black border and covered with black veins. The bright coloring of a monarch serves as a warning to predators that eating them can be toxic. During the breeding season, monarchs lay their eggs on their obligate milkweed (*Asclepias spp.*) host plant, and larvae emerge after two to five days. Larvae develop over a period of nine to 18 days, feeding on milkweed and sequestering toxic chemicals as a defense against predators. The larva then pupates into a chrysalis before emerging 6 to 14 days later as an adult butterfly. There are multiple generations of monarchs produced during the breeding season, with most adult butterflies living approximately two to five weeks. Monarch butterflies live mainly in prairies, meadows, grasslands and along roadsides. It is the Corps determination that the project would have no effect on monarch butterflies as the action area does not contain suitable habitat for feeding and reproduction.

Eastern prairie fringed orchid

Eastern prairie fringed orchid is 1 of 200 North American orchid species. Standing at 8 to 40 inches high, this species occurs in a wide variety of habitat, from mesic prairies, sedge meadows, marshes and even bogs. Current decline of this species is linked to habitat degradation. This listed species requires habitat with robust vegetative diversity. The Corps has determined that the Project would have no effect on the eastern prairie fringed orchid as the action area does not contain suitable habitat as described above.

Northern wild monkshood

Northern wild monkshood is a member of the buttercup family that inhabits shaded to partially shaded cliffs, algific talus slopes or cool, streamside sites. Northern monkshood is known for its distinctive, blue hood-shaped flowers. It is a perennial species which reproduces from both seed and small tubers. Flowers bloom between June and September, depending on location within the range, and are pollinated when bumblebees pry open the blossom to collect nectar and pollen. The Project would have no effect on northern wild monkshood as the action area does not contain suitable habitat for the species as described above.

STATUS OF THE SPECIES

This section presents the biological or ecological information relevant to formulating this Biological Opinion. The purpose is to provide the appropriate information on the species' life history, its habitat and distribution, and other data on factors necessary to its survival are included to provide background for analysis in later sections. This analysis documents the effects of past human and natural activities or events that have led to the current range-wide status of the species.

Higgins Eye Pearlymussel (*Lampsilis higginsii*)

Higgins eye was listed as an endangered species by the U.S. Fish and Wildlife Service (Service) on June 14, 1976 (Federal Register, 41 FR 24064). The major reasons for the listing of Higgins eye were the decrease in both the abundance and range of the species. As stated in the original and the 2004 revision to the recovery plan (USFWS 1983 and 2004), Higgins eye was never abundant and Coker (1919) indicated it was becoming increasingly rare around the turn of the century. The fact that there were few records of live specimens from the early 1900s until the enactment of the Endangered Species Act in 1973 was a major factor in its listing in 1976 (USFWS 2004). A variety of factors have been listed as affecting Higgins eye over time including commercial harvest, impoundment, channel maintenance dredging and disposal activities, changes in water quality from municipal, industrial, and agricultural sources, unavailability of appropriate glochidial hosts, exotic species, and disease (USFWS 1983).

Life History

Higgins eye occurs most frequently in medium to large rivers with current velocities of 0.49 to 1.51 feet per second and in depths of 2 to 20 feet. The species is significantly correlated with a firm, coarse sand substrate (Hornbach et al. 1995). Higgins eye are usually found in large, stable mussel beds with relatively high species and age diversity. The reproductive cycle of Higgins eye is typical of the family Unionidae. Males discharge sperm to the surrounding water; females obtain the sperm as they siphon water for food and respiration. Eggs are fertilized in gill sacs (marsupia) in the female; fertilized eggs are retained in the marsupia until they mature into glochidia and are released. The mantle edge near Higgins eye posterior end resembles a small swimming fish that attracts predator fish. Gill tissue containing glochidia protrudes between the mantle flaps. When the gill tissue is attacked by a fish, glochidia are released, thus enhancing the probability that glochidia will come into contact with a host fish. Released glochidia attach themselves to the gills of host fish. Successfully attached glochidia mature and excyst from hosts' gills as juvenile mussels; they settle to the substrate and become sedentary in the substrate, if it is suitable. The species is bradytictic (i.e., a long-term brooder) retaining developing glochidia throughout the year, except for the period following glochidia release. Baker (1928) and Holland-Bartels and Waller (1988) indicate glochidia are carried in the gill marsupia through winter and released the following spring or summer.

Holland-Bartels and Waller (1988) tested 15 species of UMR fish and reported walleye (Sander vitreus) and largemouth bass (*Micropterus salmoides*) as the most successful glochidia host fish for Higgins eye, as determined by glochidial persistence and maturation to juvenile stage in the fish. Subsequent studies have found Sauger (Sander canadensis), smallmouth bass (*Micropterus dolomieui*), and black crappie (*Pomoxis nigromaculatus*) have also been identified as effective hosts (Gordon 2001; Hove and Kapuscinski 2002).

Historical and Present Distribution

The historical distribution of Higgins eye is not known with certainty. Although nowhere abundant, it is believed to have been widely distributed, inhabiting the Upper Mississippi River (UMR) from just north of St. Louis, Missouri, to the Twin Cities, Minnesota (Coker 1919). It was found along the mainstem of the UMR and several of its major tributaries including the Ohio, Illinois, Sangamon, Iowa, Cedar, Wapsipinicon, Rock, Wisconsin, Black, Minnesota, and St. Croix rivers (USFWS 1983). The range of Higgins eye has been reduced significantly from its historic distribution but propagation and reintroduction efforts from 2000 to 2018 has resulted in the species expanding its present range back into areas previous extirpated from (Kelner pers. comm. and 2024) and is now found in the UMR upstream of Lock and Dam 17 near Muscatine, Iowa to Lock and Dam 2 in the Twin Cities, Minnesota; the St. Croix River between Wisconsin and Minnesota; the Wisconsin River and Chippewa River, Wisconsin; the Iowa River and Wapsipinicon River, Iowa; and in the lower Rock River, Illinois (USFWS 2020, Kelner 2024). The recent propagation and reintroduction efforts of the species currently being monitored appears successful in expanding the species range in areas the species had become extirpated into the Iowa River, Wapsipinicon River, Chippewa River, and the UMR in Pools 2-4 from the Twin Cities to Red Wing, Minnesota (Kelner 2024).

Essential Habitat Areas

There are currently 14 Higgins eye Essential Habitat Areas (EHA), ten within the UMR proper and four within two major tributaries. The Higgins eye Recovery Team in 1983 designated seven EHAs (USFWS 1983) and added three and four more in 2004 and 2008, respectively (USFWS 2004 and 2008). The EHAs were believed to contain viable reproducing Higgins eye populations at the time of their designation and critical for the species recovery. Most EHAs are substantial in size ranging from 4 to 937 acres with an average size of 231 acres. The three largest EHAs are within UMR Pool 10; Harpers Slough

(492 acres), Prairie du Chien (937 acres), and McMillan Island (440 acres). The 14 EHAs are listed below:

(1) St. Croix River Interstate Park near Taylors Falls, Minnesota (approx. River Mile 50.0)
(2) St. Croix River at Hudson, Wisconsin (River Mile 16.2 - 17.6)
(3) St. Croix River at Prescott, Wisconsin (River Mile 0 – 0.2)
(4) Wisconsin River near Muscoda, Wisconsin (Orion)
(5) UMR near Lansing, Iowa, Pool 9 (River Miles 660.0 - 661.0)
(6) UMR at Whiskey Rock, at Ferryville, Wisconsin, Pool 9 (River Mile 655.8 - 658.4)
(7) UMR at Harpers Slough, Pool 10 (River Mile 639.0 - 641.4)
(8) UMR Main and East Channel at Prairie du Chien, Wisconsin, and Marquette, Iowa, Pool 10 (River Mile 633.4 - 637)
(9) UMR at McMillan Island, Pool 10 (River Mile 616.4 - 619.1)
(10) UMR at Cassville, Wisconsin, Pool 11 (River Mile 606.0 – 611.5)
(11) UMR near Comanche, Iowa, Pool 14 (River Miles 509.1 – 510.1)
(12) UMR at Cordova, Illinois, Pool 14 (River Mile 503.0 - 505.5)
(13) UMR at Sylvan Slough, Quad Cities, Illinois, Pool 15 (River Mile 485.5 - 486.0)
(14) UMR near Buffalo, Iowa, Pool 16 (River Miles 470.0 - 471.0)

The Recovery Team determined that delisting or recovery of the species requires that populations of Higgins eye in at least five EHAs are reproducing, self-sustaining, not threatened by zebra mussels, and are sufficiently secure to assure long-term viability of the species. These five EHAs must meet the below criteria and must include the Prairie du Chien EHA and at least one EHA each in the St. Croix River and in Mississippi River Pool 14:

1. Higgins eye constitute at least 0.25% of the mussel community and the mussel habitat appears to be stable and supports a dense and diverse mussel community; or,

2. Higgins eye are found, but constitute <0.25% of the community, the mussel habitat appears to be stable and supports a dense and diverse mussel community, and zebra mussel (*Dreissena polymorpha*) densities are $<0.5/m^2$.

For each definition, “dense and diverse” mussel communities are those that:

- include a total mussel density of $>10/m^2$ (Mississippi River) or $> 2/m^2$ (other rivers); and,
- contain at least 15 other mussel species, each at densities greater than 0.01 individual/m^2.

The Service’s most recent five-year review of the current status of Higgins eye determined that downlisting or delisting of the species was not warranted at this time (USFWS 2020). Only three populations; Interstate, Hudson, and Orion fully meet EHA criteria and are currently not affected by zebra mussels (<0.5/m2) (USFWS 2020). The populations at the Pool 10 EHA at UMR Pool 10 Prairie du Chien and at the Pool 14 EHA at Cordova also met the population health criteria but are currently impacted by zebra mussels with densities >0.5/m2. Detailed descriptions for determining if the identified populations within EHAs have fully met the criteria that they are reproducing, self-sustaining, and are sufficiently secure to assure long-term viability can be found in the latest 5-year review of the species (USFWS 2020).

Status in UMR Pool 10

UMR Pool 10 supports a relatively healthy *Higgins eye* population compared to other areas throughout the species present range. There are three *Higgins eye* EHAs within UMR Pool 10; Harpers Slough in the upper portion of the pool, Prairie du Chien mid pool, and McMillan Island in the lower portion of the pool, approximately one mile upstream of the Action Area. Long term monitoring of the EHAs is ongoing and has been conducted since the early 2000s for the Harpers Slough and McMillan Island EHAs, and since the mid-1980s at the Prairie du Chien EHA. Zebra mussel infestations have had a substantial adverse impact to native mussels including Higgins eye with high mortality observed in the early 2000s within UMR Pool 10. However, zebra mussel infestations have had annual fluctuations and have generally moderated in the past two decades. As a result, Pool 10 Higgins eye densities since 2005 have equaled or exceeded densities and exceeded relative abundances from pre-zebra mussel infestation in 1993-94.

Specifically, the Higgins eye population within the Action Area, which occurs approximately one mile downstream of the McMillan EHA, zebra mussel impacts have had similar adverse impacts to the species in the early 2000s, but the species has equaled densities and relative abundances from pre-zebra mussel infestations.

Higgins eye in the Action Area

Summary of Past and Present Impacts to Higgins eye within the Action Area

The major direct effects to *Higgins eye* from the establishment and maintenance the 9-ft Channel and preceding navigation projects including within Pool 10 and the Action Area occurred nearly a century ago. Since 2000, no known effects to Higgins eye have occurred as a result of the direct impacts from continued operation and maintenance of the 9-Foot Navigation Channel and have no effects to mussel including Higgins eye. However, tow traffic impacts to Higgins eye within the Action area, although minor in nature, groundings and near channel border disturbance likely have effects to mussels including Higgins eye within the Pool 10 Mooring Cell Action Area.

Recreational boat traffic throughout the Action Area likely has had a minimal adverse impact to mussels. Harvesting of mussels, which is legal in the UMR in Iowa waters with a fishing license, may have resulted in minimal adverse impacts to Higgins eye given the species can be misidentified as a common species. Adverse impacts could occur to the species into the future as long as harvest for personal use is allowed. The greatest adverse impact to mussels including Higgins eye within the Action Area has been from zebra mussels which are likely to persist within the Action Area and impact native mussels into the future due to habitat availability and continued transport of the species by various vectors present within the river system.

Current Status of Higgins eye in the Action Area

A mussel survey was conducted during October 2023 to characterize habitat and the mussel community potentially impacted from the Project (Figures 4 and 5) (EnviroScience 2024). Details regarding survey methods can be found in Attachment C of the BA. A total of seven live Higgins eye were collected within the Action Area. Six of the seven individuals were collected outside of the designated navigation channel whereas one was collected a few meters from the channel border within the navigation channel.
The survey area supports a dense and diverse mussel community that also includes an Iowa endangered species, yellow sandshell (*Lampsilis teres*). A total of 2,111 live mussels of 24 species were collected and overall average density was 26.3/m2. Mussels were present throughout much of the survey area but were

concentrated upstream of the proposed mooring cell location and outside of the navigation channel. Of the 2,111 live mussels collected, 26% and 74% of the mussels were collected from within and outside of the navigation channel, respectively. The survey area meets most of the Higgins eye EHA criteria. Higgins eye relative abundance was 0.3% across all sampling methods, stable substrate was present (Figure 5), and the community supports a diverse mussel community with 24 live species present (EnviroScience 2024).

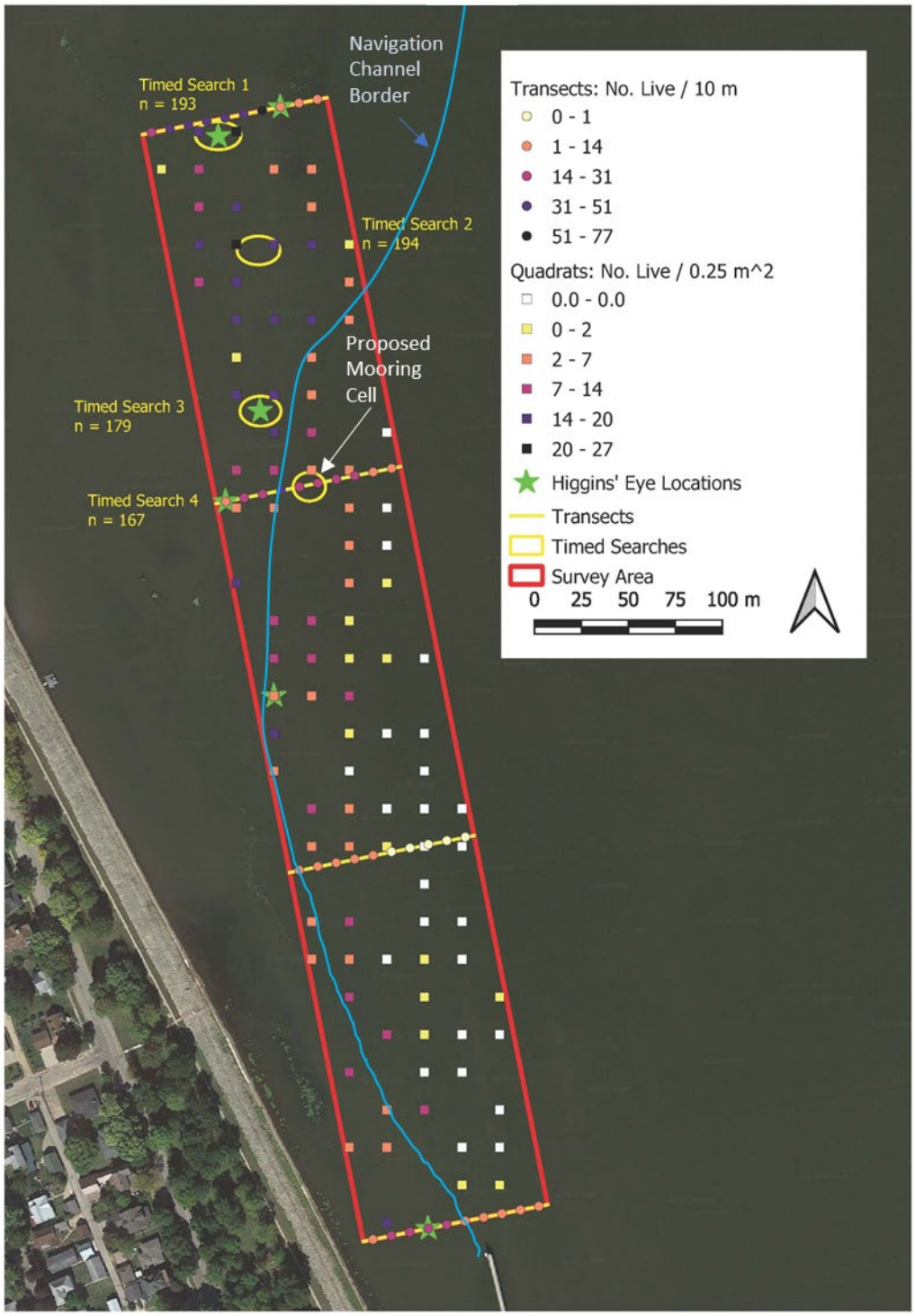


Figure 4. Overview of mussel sampling areas and Higgins eye locations for October 2023 survey.

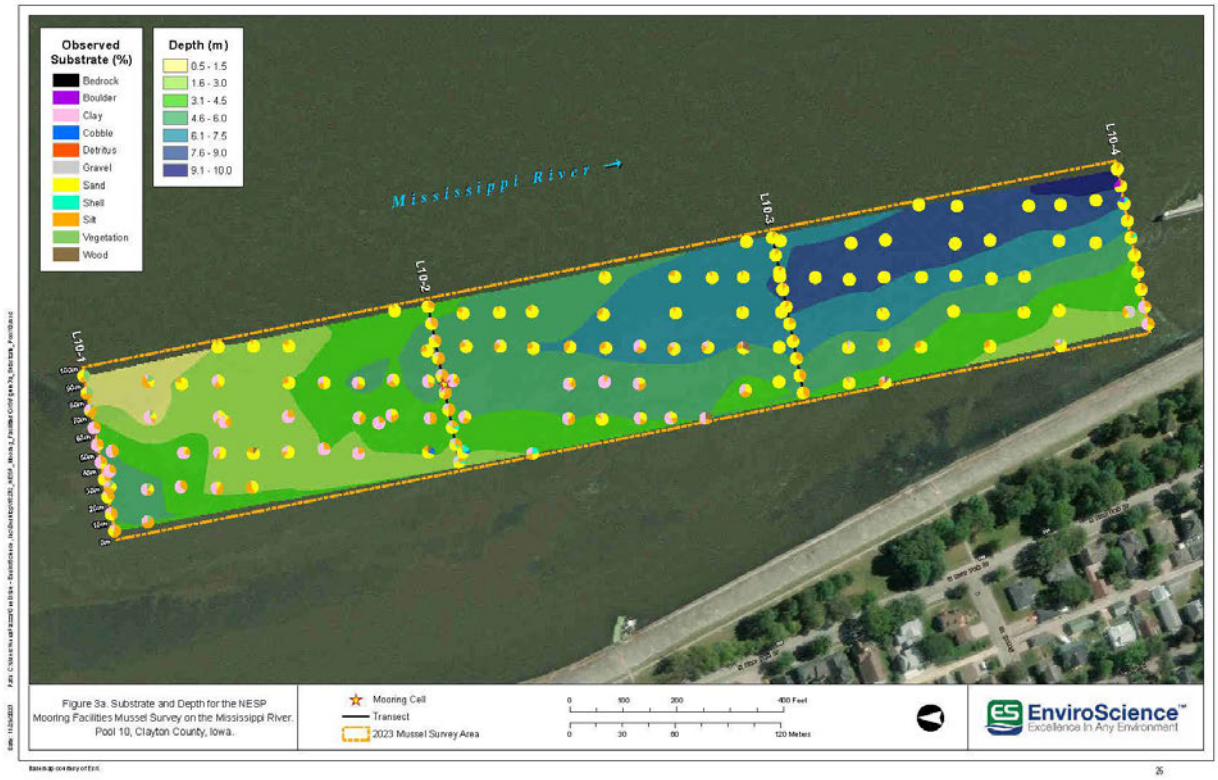


Figure 5. Substrate type and depths observed during survey conducted October 2023.

Estimated overall Higgins eye density within the 60,000m2 (14.8 acres) mussel survey study area (which encompasses the Action Area) was 0.04/m2 which results in approximately 2,400 Higgins eye occurring in the survey area. Using the overall average density of Higgins eye and applying that to the proposed mooring cell footprint of 1616.4m2, it is estimated that 65 Higgins eye occur within the mooring cell footprint. This however is a general estimate as it applies across the entire survey area which includes multiple different habitat types. No Higgins eye were discovered within the mooring cell footprint or in areas that are more representative habitat type in which the cell will be placed. All L. higginsi discovered during the dive survey were in within areas that are shallower than where the cell will be placed. We expect the true number of L. higginsi within the cell footprint will be fewer than 65 individuals.

ENVIRONMENTAL BASELINE

The commercial harvest of mussels in the UMR peaked during the pearl button period of the 1920s and later during the cultured pearl era in the late-1980s and early 1990s (Thiel and Fritz 1993). However, commercial harvest has dramatically declined in the UMR in the past two decades due to dramatic decline in demand and dropping prices for shell material. Commercial clamming is not prohibited in Iowa, where the Action Area resides, and if demand increases in the future, commercial harvest either legally or illegally, could pose a threat.

The five UMR states (Iowa, Illinois, Minnesota, Missouri, and Wisconsin) have regulated mussel harvest since the latter portion of the pearl button era in the late 1930s (Waters 1980) and are continuing to revise the regulations to strive for uniformity among the states and to reflect present-day biological data and concerns (Table 3). Commercial harvest of mussels for sale is presently only allowed in Illinois. Holders of sport fishing licenses in Iowa may take mussels throughout the year in the Mississippi River and connected backwaters including within the Action Area. The possession limit in Iowa is 24 whole mussels of non-state listed species, and the sale of mussels or shells is prohibited. A common species, Hickory-nut (*Obovaria olivaria*) is similar in appearance to Higgins eye, whereas the other species that may be taken with a fishing license taken in Iowa are noticeably different in appearance. The misidentification of Higgins eye as hickorynut could result in adverse impact to Higgins eye in Iowa waters including within the Pool 10 Mooring Cell Action Area.

Table 3. Commercial harvesting by state.

State	State Status	Commercial Harvest	EHA Commercial Harvest Restrictions	Citations
Illinois	Endangered	Not prohibited but commercial license needed.	Some location restrictions. Harvest is not allowed within Sylvan Slough in UMR Pool 15.	IL Admin Code 2019 ILDNR 2019 IL ESPB 2015
Iowa	Endangered	Prohibited but allowed with recreational fishing license. No state listed species permitted.	No EHA restrictions. Harvest is allowed for personal use and not for sale with a fishing license in the Mississippi River and connected backwaters.	IA DNR 2014 IAC 2009
Minnesota	Endangered	Prohibited.	NA	MNDNR 2020
Missouri	Endangered	Prohibited.	NA	www.mdc.mo.gov/fishing/seasons/mussels-clams
Wisconsin	Endangered	Prohibited	NA	WIDNR 2020

Channel Maintenance

The major direct effects to Higgins eye from the 9-Foot Channel and preceding navigation projects occurred nearly a century ago, but continued channel maintenance activities (dredging, disposal, clearing and snagging, channel structures/revetment) may affect individuals or populations of Higgins eye at a local scale. The Corps has and will continue to consult with the Service on future operation and maintenance projects that may affect Higgins eye. Through the Section 7 process and Tier II assessments, impacts to Higgins eye are being avoided and minimized. Since 2000, no known effects to Higgins eye

have occurred as a result of the direct impacts from continued operation and maintenance of the 9-Foot Navigation Channel Project.

The thousands of channel structures built for the 4½- and 6 Foot Navigation Channel Projects may have contributed to the historic decline of Higgins eye. However, these impacts are largely unknown, and most occurred nearly a century ago. Modification or placement of new channel structures may affect Higgins eye. As with channel maintenance activities, channel structure work is routinely coordinated with interagency groups to avoid/minimize project impacts to fish and wildlife resources, including freshwater mussels. The Corps and Service are continuing to conduct individual Section 7 consultation and Tier 2 Assessments on all channel structure projects likely to affect Higgins eye. However, there are no channel structures within the Pool 10 Mooring Cell Action Area and impacts to Higgins eye from channel maintenance are not expected.

Commercial Navigation

The effects of past and on-going commercial navigation have been discussed in the 2000 Biological Opinion for the Continued O&M of the 9-Foot Channel Project (USFWS 2000) and is summarized below in Sections 3.1.7.3.1 to 3.1.7.3.3 and incorporated by reference. The actions included in this summary included tow traffic, fleeting and port facilities.

Tow Traffic

Laboratory and field studies conducted at UMR mussel beds from 1988 to 1994 monitored and analyzed the biological and physical effects of movement of commercial navigation traffic along the main navigation channel border (Miller et al. 1996). The studies found that periods of increased velocity, flow reversal, and elevated levels of suspended solids do not directly affect mussels, but indirect effects could occur to mussels from prolonged vessel movements and increased sedimentation from bank erosion along the main navigation channel borders. Impacts to mussels through grounding of vessels could occur. Most commercial navigation occurs in the main navigation channel and has been ongoing since construction of the 9-Foot Channel Project. Any major changes that affected the species occurred in the years following construction of the project. Impacts to *L higginsii* resulting from individual vessels are minor in nature, mostly in the form of harassment along the main channel borders (USFWS 2000). Although minor in nature, groundings and near channel border disturbance likely could have effects to mussels including Higgins eye within the Pool 10 Mooring Cell Action Area given the site lies along the channel border.

Fleeting

Continued use of existing barge fleeting areas, or development of new fleeting areas may adversely affect freshwater mussels including Higgins eye. Future expansion of fleeting areas or terminals will be subject to regulation and environmental review including Section 7 consultation with the Service. Through the Section 7 process, impacts to Higgins eye will be avoided and minimized. There are no existing fleeting areas within the Pool 10 Mooring Cell Action Area.

Port Facilities

There are approximately 120 commercial port facilities in the range of Higgins eye (UMR upstream of lock and dam 19; Minnesota River; Black River; and St. Croix River). Port facilities likely impacted native mussels through habitat loss during construction or subsequent maintenance of facilities. Future expansion of fleeting areas or terminals will be subject to regulation and environmental review including

Section 7 consultation with the Service. Through the Section 7 process, impacts to Higgins eye will be avoided and minimized. There are no existing port facilities or fleeting areas or effects to mussels within the Pool 10 Mooring Cell Action Area.

Toxic Chemical Spills

Toxic chemical spills have killed both fish and mussels, particularly in the Mississippi River where several have been documented. For example, approximately 295 Higgins eye were estimated to be lost as a direct result of the 2008 Guttenberg train wreck oil spill in Pool 11 several river miles downstream of the Pool 10 Mooring Cell Action Area. Chemical spills likely will continue to occur and have the potential to eliminate Higgins eye populations completely from river reaches and, possibly, entire rivers. No one spill is likely to eliminate the entire range; however, one spill could affect multiple EHAs in succession. The extent of any spill is dependent on several variables (e.g., type and amount of chemical, timing of the spill response) (USFWS 2020). Any future spill that would occur within the area potentially affecting mussels in the Action Area would be subject to Section 7 consultation with the Service and likely need to be compensated for under the Natural Resources Damages Assessment (NRDA) as administered by the Service and the US Environmental Protection Administration (EPA).

Recreation

Some recreational facilities likely degraded habitat for freshwater mussels. Construction activities, such as sand fill for beach or swimming areas, placement of fill or dredging to create marinas/harbors, or riprap for shoreline protection likely covered or otherwise permanently changed mussel habitat. Large vessel traffic could impact mussels through abortion, direct mortality, or other disturbance factors. Miller et al. (1996) indicated the velocity changes created by tow passage did not impact benthic organisms or their habitat, therefore it is unlikely large recreational craft within the navigation channel would impact similar habitat either. However, recreational craft are more capable of navigating shallower water, so have a higher potential to impact more habitat. Recreational vessels are also likely to contribute to the transport of zebra mussels, which the Service has found to be a major concern to the survival of the species. Swimmers have been observed collecting mussels at some beach sites where indiscriminate collections may have included Higgins eye at some locations.

There are minimal adverse impacts to mussels within the Action Area from recreational boat traffic. Although recreational boaters use the main navigation channel and channel border area near the Action Area, impacts to mussel are likely minimal given mussels are at water depths >9ft deep in the navigation channel and >6ft deep in the off-channel border area and likely not impacted from recreational boat wakes.

Nonindigenous Species

The nonindigenous species that poses the most significant stressor to Higgins eye is the zebra mussel, although the Asian clam (*Corbicula fluminea*), non-native carp, and round goby (*Neogobius melanostomus*) all continue to impact Higgins eye and other freshwater mussels by outcompeting Higgins eye for resources (e.g., food, space) and prevent them from normal behavior (e.g., movement, burrowing, siphoning). Recently black carp (*Mylopharyngodon piceus*), which are known molluscivores, have expanded their distribution within the range of Higgins eye; however, the extent to which they prey on Higgins eye is not known (USFWS 2020). Of these, currently only zebra mussels pose a threat to Higgins eye within the Action Area and it's uncertain if the others could pose a threat in the future within the Action Area.

The zebra mussel is a recent addition to the aquatic fauna of the UMR System. Currently zebra and quagga mussels primarily occur throughout the Great Lakes, Mississippi River, Red River of the North, and Ohio River watersheds (Figure 6). The first zebra mussel was collected from the UMR on September 12, 1991, just south of La Crosse, Wisconsin in Pool 8. Zebra mussels were discovered shortly after in Pool 10 where they currently are present including within the Pool 10 Mooring Cell Action Area.

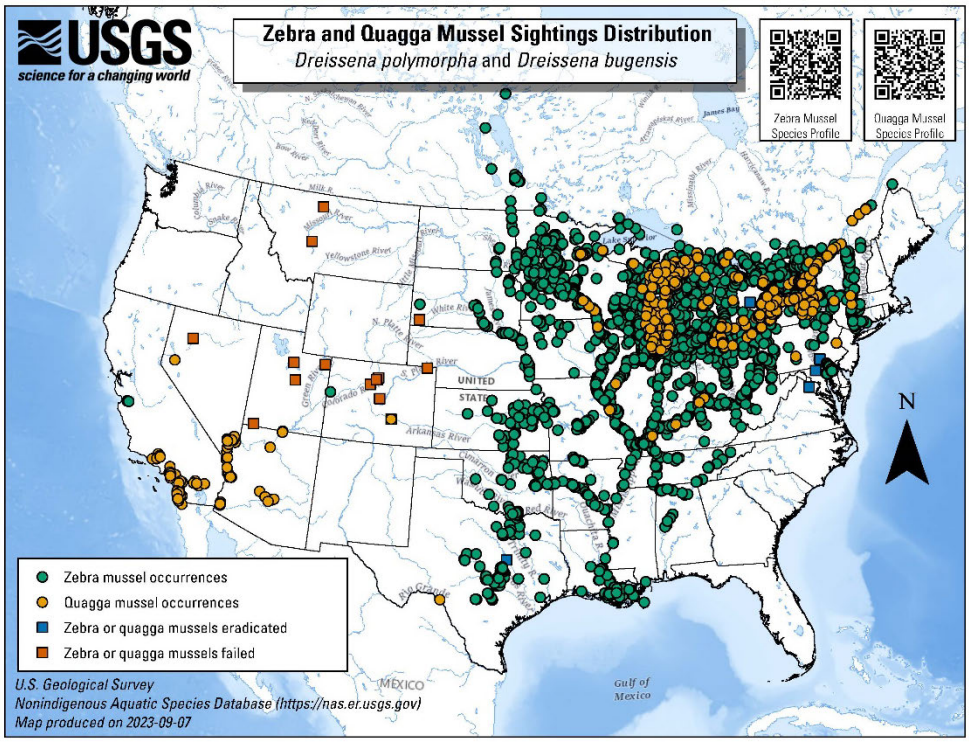


Figure 6. Zebra and quagga mussel current distribution in North America, 2023.

Impacts of zebra mussels on native mussels including Higgins eye

Zebra mussels pose a threat to native mussels through both direct and indirect impacts. High-density infestations of zebra mussels (>1000/m2) can interfere with the ability of native mussels to feed and reproduce and have caused substantial mortality (Ricciardi et al. 1998). Their attachment to the shells of the native species impacts feeding and filtering functions, prevents valve closure, and causes shell deformation. Native mussel locomotion can be impacted by zebra mussel attachment to individuals. Zebra mussels can prevent colonization of native mussels in formerly suitable habitats and prevent their burrowing into substrate by forming a layer preventing their penetration. Indirect impacts of zebra mussels include competition for food resources, possible unionid glochidia consumption by zebra mussels, and changes in the water chemistry, especially dissolved oxygen levels.

Spread and distribution of zebra mussels in the UMR

The zebra mussel is mainly dioecious, releasing gametes into the water for external fertilization. Spawning is usually synchronized throughout a population to ensure maximum fertilization. The resulting larvae, known as veligers, are free floating for 10-14 days and are capable of only vertical movements in the water column. They are unable to swim horizontally and therefore can only colonize new areas passively via water currents. Upstream colonization of zebra mussels in the UMR, as well as other rivers,

is therefore dependent upon a vector (e.g., boat, barge, or waterfowl) or upstream currents. Zebra mussels will attach to nearly all available hard substrates, including rocks, native mussels, glass bottles, tin cans, woody debris, and lock and dams. However, they may also extensively colonize soft substrates such as aquatic vegetation or soft mud (Whitney et al. 1995, Garton and Haag 1993).

Zebra mussel populations have been established within Pool 10 and throughout the UMR including within the Action Area and negative effects on native mussels have been observed (Miller and Payne, 2000). Native mussels have been monitored nearly annually since the mid-1980s including zebra mussels since their arrival in the mid-1990s to present day at the Higgins eye EHA at Prairie du Chien, Wisconsin (Figures 7 and 8). Native mussel densities within the EHA exceeded 100/m2 in the mid-1980s and >60/m2 into the1990s before zebra mussels were introduced in 1995.

Zebra mussel densities increased in the late 1990s and peaked from 2000-02 with densities approaching 10,000/m2. High mortality of native mussels from zebra mussel impacts was observed and there was a significant decline in native mussel densities from 1998-2003. Since about 2005 zebra mussel densities have mostly remained low to moderate and native mussel densities have increased, albeit not to pre-zebra mussel densities, but appear to have stabilized presently to about 40/m2. Given the higher zebra mussel densities observed in 2021-22 it remains unknown as to how native mussels will be impacted into the near future. It seems likely populations of zebra mussels will persist due to habitat availability and continued transport of the species by various vectors present within the river system. Similar zebra mussel trends and current infestation levels with associated mortality within the Action Area appear similar to those trends and infestation levels within Pool 10.

Zebra mussel infestation of native mussels within the Pool 10 Mooring Cell mussel survey during 2023 were at similar levels to infestation as observed from mussel monitoring in the pool during 2023 at the Prairie du Chien EHA and McMillan Island EHA. Zebra mussels are likely to persist within the Action Area and impact native mussels into the future due to habitat availability and continued transport of the species by various vectors present within the river system.

UMRR and NESP Projects

The Corps, often in partnership with the Service, undertakes habitat rehabilitation and enhancement projects as well as ecosystem restoration and cultural resources management/mitigation projects within the UMR under the UMRR-HREP and NESP programs. The Corps consults on each project when the project may affect listed species including Higgins eye. In lower Pool 10, the Corps consulted on its “may affect, not likely to adversely affect” determination for Higgins eye for the Lower Pool 10 HREP, where effects are wholly discountable or beneficial. Several miles upstream in Pool 10, outside the Action Area for the proposed action, the Corps is currently consulting for impacts to Higgins eye for the Sny Magill project under NESP. Though both the present proposed action and the Sny Magill project are located in Pool 10 and are implemented under NESP, their impacts to Higgins eye are not being evaluated jointly as they are individual and separate projects with separate action areas.

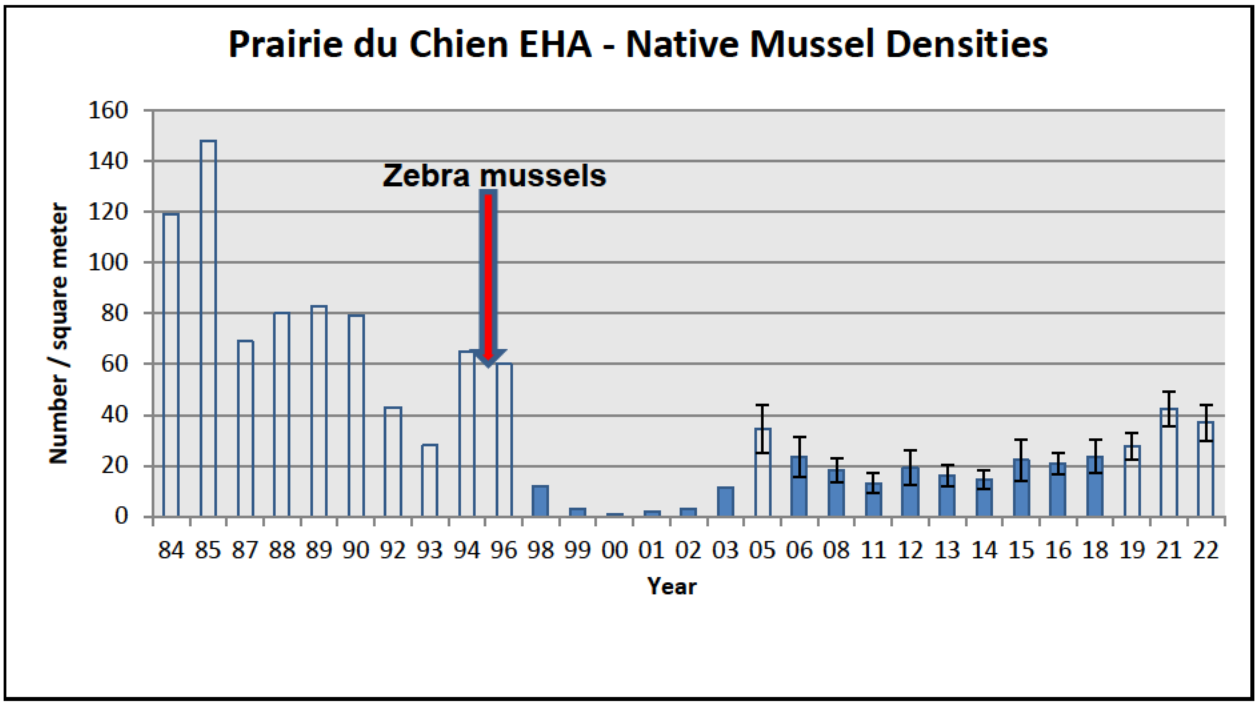


Figure 7. Native mussel densities and the arrival of zebra mussels at the Higgins eye EHA at Prairie du Chien, Wisconsin.

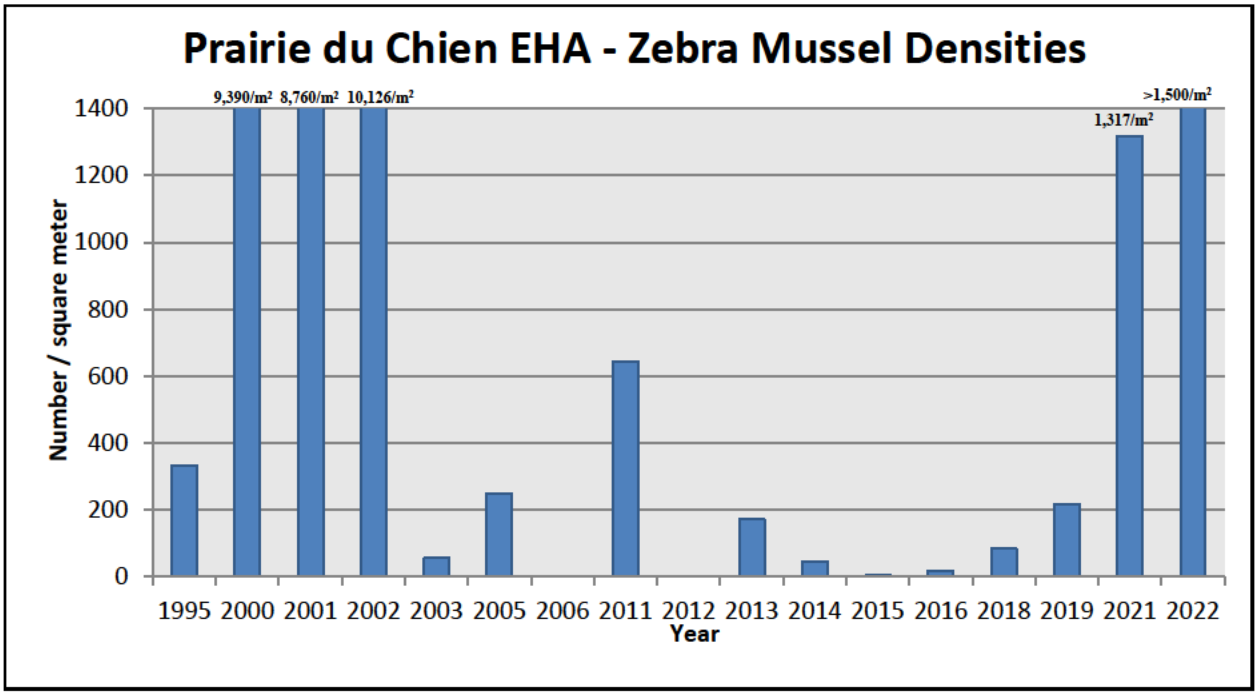


Figure 8. Zebra mussel densities at the Higgins eye EHA at Prairie du Chien, Wisconsin.

EFFECTS OF THE ACTION

In accordance with 50 CFR 402.02, effects of the action are "all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action." (See §402.17).

Mooring cell construction would be anticipated to have direct impacts to Higgins eye. Mussels living within the proposed in-water mooring cell footprint would be killed by burying, crushing, or physical removal in excavated material. The only federally listed mussel species potentially impacted by the Project is Higgins eye, therefore no direct or indirect positive or adverse effects are expected to other federally listed mussel species.

Measures to Avoid and Minimize Impacts

The proposed plan has the smallest in-water footprint practicable for a mooring cell. Typical cell design requires scour protection that is twice the width of the cell itself in order to prevent catastrophic failure in the event of a collision. Using hydrologic and impact modeling it was deemed that the cell could be smaller than typical design in order to reduce impacts to benthic habitats. The location of the mooring cell was coordinated with the navigation industry and is positioned for maximum use by the navigation industry while not interfering with passing navigation traffic. Alternatives that avoided all adverse effect to and take of the species were not available because placement farther offshore would interfere with navigation, conflicting with the nine foot navigation channel project and conflicting with the purpose of the proposed action. The mooring cell location lies within depths required for the navigation channel and avoids the channel border and shallower water areas which contain more of a diverse mussel community. Earlier in the design process, the Corps considered a mooring cell with a smaller footprint. The smaller mooring cell footprint, with less protective rock, was not feasible or practicable because the scour protection was inadequate by current cell design standards. The current proposed footprint has been minimized to the maximum extent.

Conservation Measures (as proposed in the BA and described in this BO) will be used to avoid and minimize effects to Higgins eye and will be incorporated into the project.

Direct and Indirect Effects – Construction

There will be a direct effect to Higgins eye living within the proposed in-water footprint of the mooring cell, including rock base, resulting in an incidental take of 65 individuals. It is anticipated 80% of individuals of Higgins eye will be moved from the impacted areas to the mussel bed adjacent to the site. It's anticipated approximately 5% of the Higgins eye relocated (3) will die as a result of indirect effects associated with handling and relocation. It is anticipated that approximately 20% of individuals within the in-water footprint would be missed during the collection resulting in an incidental lethal take of 13 individuals. Individuals within the in-water footprint of the proposed mooring cell would be killed by burying, crushing, or removal of material in order to construct the mooring cell. In total, we therefore estimate 16 Higgins eye would be killed from construction of the mooring cell and mussel relocation. No indirect effects are expected as all work would be conducted within depths greater than 15 feet, and commercial navigation will continue to use the navigation channel after construction within the Action Area as previously. The one-time removal of Higgins eye from the mooring cell footprint should result in no long term detrimental or beneficial impacts to the species within the Action Area or UMR Pool 10.

The estimated mortality of 16 individuals represent a very small percentage (0.7%) of the Higgins eye population of 2400 within the Action Area. The removal of such a small number of individuals should have no long-term appreciable impacts to Higgins eye populations within the Action Area or Pool 10. There would be no direct or indirect effects to mussels near the Action Area in deeper water where construction barges may pass because the depths should be adequate to avoid disturbance. Mussels located in shallow water near the Action Area are also not expected to have direct or indirect effects as all work will be conducted over deeper water as shallow water areas will not be permitted to be used for access and designated as exclusion zones as outlined in the Conservation Measures. Once in place, the mooring cell structure would not appreciably alter hydrology or mussel habitat conditions and would have no direct or indirect effects on mussels including Higgins eye within or near the Action Area.

Direct & Indirect Effects – Operation and Maintenance

There should be no routine maintenance from operation of the mooring cell required once the mooring cell is constructed, beyond what is already conducted for operation and maintenance of the 9-ft Channel Project. These effects are described in in the 2000 Biological Opinion for the Continued O&M of the 9-Foot Channel Project (USFWS 2000). In the event a repair to the structure would be needed, such as after a damage-causing event, the Corps would reinitiate Section 7 ESA consultation if appropriate. There are no expected direct or indirect effects from the operation of the structure due to the cell being located in depths greater than 15 feet which is likely deep enough to avoid disturbance of any mussels. There are no expected direct or indirect effect of barge use of the cell, either from ingress or egress as barges will be on the channel ward side and engines will be powered down eliminating continuous prop wash.

Secondary Effects

There are expected to be no secondary adverse impacts to Higgins eye from construction, use, or operation and maintenance. The project may result in improvements to the quality of mussel habitat compared to no action, under which barges while waiting to lock through, would continue to push onto shallower areas and otherwise disturb sediments from grounding and with propeller wash from running engines along the channel border, which can result in crushing mussels and increasing sediment resuspension further impacting mussels, respectively. Following construction of the proposed mooring cell, tows would no longer be anticipated to ground in shallow areas while awaiting passage through the lock chamber as they will be moored to the cell. With usage of the mooring cell, transit time to the lock for downbound tows will be reduced, speeding up lockages and reducing wait times. Usage of the mooring cell will also allow tows to reduce engine power, minimizing sediment resuspension and prop wash. Long term secondary effects of mooring cell usage may be beneficial to Higgins eye due to the cell being located in depths greater than 15 ft which is likely deep enough to avoid disturbance.

Commercial navigation occurs within the navigation channel within the Action Area and has been ongoing since construction of the 9-Foot Channel Project, and the project will not alter commercial navigation traffic or 9-Foot Channel Project O&M. Any major changes that affected the species occurred in the years following construction of the navigation project. Commercial Navigation and any associated impacts to Higgins eye within the Action Area would remain with or without the proposed mooring cell. More recently, the construction and operation and maintenance of the 9-Foot Channel Project has led to the introduction in the mid-1990s and spread of zebra mussels system wide including into the Action Area. Zebra mussel infestation peaked in the early 2000s with high mortality of native mussels observed in many places within the UMR including Pool 10. Zebra mussel populations have declined since their peak but appear to be annually cyclic, and it remains uncertain if population levels will increase to levels previously. Zebra mussels are an established non-native invasive species in the UMR and the construction and use of the proposed mooring cell at this location would have no direct or indirect impact

on zebra mussel populations in Pool 10 and would not provide any new vectors for their spread across the system.

Recreational boating will likely remain the same within the area and will not have secondary adverse effects.

Cumulative Effects

The ESA defines a cumulative effect as those effects of future State or private activities not involving Federal activities, that are reasonably certain to occur within the Action Area of the Federal action subject to consultation (50 CFR 402.2). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Given the location of the Action Area within waters of the U.S. and the USACE 9-Foot Navigation Project, future actions are generally expected to be subject to consultation due to Federal involvement in permitting processes (Section 404 permits under the Clean Water Act, Section 408 permissions), other than ongoing non-federal activities already described such as recreational boat traffic and mussel harvest for personal use. No future non-federal actions with effects beyond those already described are reasonably certain to occur in the Action Area.

The impacts of toxic spills or zebra and quagga mussels on Higgins eye remain unknown at this time. Recent toxic spills via derailments have occurred near the Action Area, an active railroad exists immediately adjacent to the site. However, toxic spills are not reasonably certain to occur in the future. As discussed above, it remains uncertain if zebra mussel population levels increase to levels previously observed in UMR Pool 10 in the early 2000s when high native mussel mortality was observed. However, any increase in zebra mussel populations would occur regardless of if the Project was constructed.
The effects of climate change could have an adverse effect on Higgins eye within the Action Area in the future from increasing temperatures and higher flows. Average annual discharge has increased over the past couple decades and is expected to continue increasing within the Action Area. Based on a combination of climate and hydrologic modeling and analysis, water quality of the project area is expected to decrease in the future as the result of increased loading of total suspended sediment; total phosphorus; and total nitrogen, all shown to have adverse impacts to native mussels. The proposed project would not contribute to decreases in water quality.

Because no designated critical habitat is within the action area, no destruction or adverse modification of critical habitat is expected to occur.

JEOPARDY ANALYSIS

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

Jeopardy Analysis Framework

"Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, (2) Environmental Baseline, (3) Effects of the Action, and (4) Cumulative Effects. The jeopardy analysis in this Opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the Action Area in providing for those needs. It is within this context that we evaluate the significance of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Analysis of Jeopardy

After reviewing the current status of Higgins eye, the environmental baseline for the action area, the effects of the proposed project, and the potential for cumulative effects, it is the Service's biological opinion that the Project, as proposed, is not likely to jeopardize the continued existence of Higgins eye. Because no designated critical habitat is within the action area, no destruction or adverse modification of critical habitat is expected to occur.

CONCLUSION

Impacts from construction and operation and maintenance of the Pool 10 Mooring Cell on endangered or threatened species other than Higgins eye are summarized in Table 2. It's the Corps' determination that the proposed Project may affect and is likely to adversely affect Higgins eye. Furthermore, the Corps has determined that the proposed project would likely result in the incidental take of 65 individuals of this species, of which approximately 75% (49 individuals) would be non-lethal take associated with relocation as they would be successfully moved from impact areas and survive. Separately and cumulatively, the adverse effects of the Project would be short term and would not cause long-term negative impacts to Higgins eye populations. We determine that there will be no appreciable long term adverse impacts to Higgins eye populations in the Action Area or UMR Pool 10 as a result of the potential one time mostly non-lethal impact to 65 Higgins eye from the Project. There may be long term beneficial effects to Higgins eye as a result of the project by reducing shallow water groundings and sedimentation within the Action area.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulation pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any suchconduct. Harm is further defined by the Service to include significant habitat modification or degradationthat results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the Service as intentionalor negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, orsheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibitedtaking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the Corps, or applicant sothat they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in Section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered bythis incidental take statement. If the Corps: (1) fails to assume and implement the terms and conditions or fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of incidental take, the Corps must report the progress ofthe action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

Because incidental take is defined as take that is incidental to, and not the purpose of, the carrying out ofan otherwise lawful activity, this Incidental Take Statement is valid only upon receipt by the Corps of allappropriate authorizations and permits from federal, state, and local permitting authorities.

Amount or Extent of Take

Formal consultation as defined in the Endangered Species Act of 1973, as amended (ESA), Sub- part B, 50 CFR 402.14(i)(1)(i) states that surrogates may be used to express the amount or extent of anticipated take provided that the Biological Opinion or incidental take statement: (1) describes the causal link between the surrogate and take of the listed species; (2) describes why it is not practical to express the amount of anticipated take or to monitor take-related impacts in terms of individuals of the listed species; and (3) sets a clear standard for determining when the amount or extent of the taking has been exceeded.

Estimating take of mussels in terms of number of individuals may not be practical due to limited search efficiency (50%) and uncertainty in extrapolating estimates over the entire Project area since some species may occur in the Project area but have not been encountered in survey or salvage efforts to date. Because mussel density and distribution are strongly associated with habitat conditions, using habitat as a surrogate for take of listed species may be a reasonable alternative. While the number of listed individuals in the Project area cannot be accurately estimated, the quantity of habitat lost can be readily measured and provides a clear standard for determining when take has been exceeded.

Determining the exact number of individuals that may be taken because of the Project is not realistic due to limited search efficiency and uncertainty in applying relative abundance/density data to the entire Project area. Search efficiency for the mussel salvage effort is limited by mussel size and the tendency of mussels to be below the water/substrate interface at any given time; small individuals and individuals buried in the substrate are less likely to be detected.

Limited search efficiency, as well as the need to extrapolate mussel relative abundance over the entire Project area, introduces uncertainty in determining the number of mussels potentially occurring within the Project area, as well as those potentially present in the proposed relocation area that might be affected by translocation of salvaged mussels. Take estimates for the Project area are necessarily calculated based on the number of individuals encountered, but number of individuals encountered does not necessarily accurately reflect the species' actual abundance. As a result, predicting the precise number of individuals that will be taken is not possible. Additionally, it is not practical to monitor take-related impacts in terms of individual mussels because annual losses may be masked by annual fluctuations in the species' abundances.

Take Estimate

The capture, handling, temporary holding, and transport of mussels during surveys, salvage, and relocation have the potential to cause increased physiological stress, resulting in disruption of spawning and fertilization, growth, and feeding. While stress associated with relocation is reduced by proper handling, there is increased physiological stress during relocation. Any mussels relocated may suffer harm in the form of impairment of essential behavior patterns. Of the freshwater mussels relocated, a small number may be harmed as a result of salvage and relocation activities due to direct mortality as a result of unknown or uncontrollable factors.

Additionally, during relocation efforts not all mussels are detected (e.g., juveniles, small-bodied mussels, deeply burrowed individuals). The goal of detection is 80%, therefore 20% of mussels that are not detected during relocation efforts in the action area will be harmed. Estimated overall Higgins eye density within the 60,000m^2 (14.8 acres) mussel survey study area (which encompasses the Action Area) was 0.04/m^2 which results in approximately 2,400 Higgins eye occurring in the survey area. Using the overall average density of Higgins eye and applying that to the proposed mooring cell footprint of 1616.4m^2, it is estimated that 65 Higgins eye occur within the mooring cell footprint. Assuming an 80% detection rate and 5% post relocation mortality, the mortality estimate for the unavoidable take of the remaining 25% of Higgins eye in the action area may be up to 16 individuals. Amount and type of anticipated take of Higgins eye is summarized in Table 4.

Harm within the action area will result due to direct mortality from crushing, injury, smothering due to fill or desiccation from exposure in unwetted areas. Undetected mussels within the indirect impact areas (buffered areas upstream and downstream of action areas) may suffer from disruption of normal respiration, feeding, growth, and reproduction resulting from increases in turbidity and changes in hydrology. These effects are likely to be most severe in the buffered areas directly adjacent to areas of direct impact, resulting in harm.

Table 4. Amount and type of anticipated incidental take.

Common Name	Overall Estimated Take	Highest Estimated Mortality (As a portion of estimated take)
Higgins Eye (*Lampsilis higginsii*)	65	16

Effects of the Take

The Service has determined that based on the proposed Project and the conservation measures described, these levels of anticipated take are not likely to result in jeopardy to Higgins eye. No critical habitat has been defined for Higgins eye. Avoidance and minimization measures (AMMs) have been developed specific to the project that are intended to minimize direct, delayed, and cumulative impacts to the project area and are described above in this BO and in the BA.

Reasonable and Prudent Measures

These reasonable and prudent measures, with implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these reasonable and prudent measures, the Service believes that no more than 65 Higgins eye will be incidentally taken. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Corps must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Corps is committed to following Conservation Measures (as proposed in the BA and described in this BO). The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of Higgins eye:

1. Minimize Construction Impacts
    - Follow all Conservation Measures proposed in the BA and discussed in this BO.

2. Mussel Relocation
    - Prior to construction, relocate all mussels from the impact area based on the relocation plan described in the BA and discussed in this BO.

Terms and Conditions

To be exempt from the prohibitions of Section 9 of the ESA, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and along with any required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Minimize Construction Impacts
    - CM-1: The construction work limits will be the minimal area necessary to complete the Proposed Project and will be specified in the construction plans. Prior to construction, exclusion zones will be established and monitored within the Action Area to delineate avoidance areas for the contractor. Construction limits will be clearly marked with high visible markers or barriers. Construction personnel will strictly limit their activities, vehicles, equipment, and construction materials to within the confines of the designated construction limits.
    - CM-2: Best management practices associated with Corps Nationwide Permit 25 and the State of Iowa's Section 401 water quality certification will be required of the contractor to minimize in-water stream bed disturbance when constructing the stream bank protection feature.
    - CM-3: Prior to construction activities, the Corps designated project biologist will conduct pre-construction environmental briefing for all construction crew members. The briefing will focus on required avoidance/minimization measures and conditions of regulatory agency permits and approvals. The briefing will also include a summary of sensitive species and habitats potentially present within and adjacent to the Action Area.
    - CM-4: Invasive species prevention.Prior to transportation along roads into or out of the worksite, or between water bodies within the project area, all equipment must be free of any aquatic plants, water, and prohibited invasive species including zebra mussels.
        - The Contractor shall clean each previously used piece of construction equipment and watercraft prior to bringing it onto the project site and prior to removing it from the site to prevent the spread of invasive species.
        - The Contractor shall ensure that the equipment and watercraft is free from soil residuals, egg deposits from plant pests, noxious weeds, plant seeds, aquatic plants and animals (including zebra mussels), and residual water.
        - Cleaning of equipment and watercraft shall be in accordance with the Environmental Protection Plan submitted by the Contractor and approved by the Corps.
        - If construction equipment or watercraft brought to the project site is found to be contaminated with invasive species, despite implementation of Best Management Practices, the Contractor shall not use the construction equipment or watercraft in its present state.
        - Any contaminated construction equipment or watercraft in water shall immediately be placed on dry land.
        - The Contractor shall follow decontamination protocols as identified in the environmental protection plan.
        - Contaminated equipment shall be decontaminated on site if there is an area that meets decontamination protocols.
        - If this is not possible, the equipment shall be quarantined on site until a decontamination plan is approved by the Contracting Officer.
        - Such equipment shall not be used on site until all invasives have been removed and documentation verifying the results of the cleaning is provided.
    - CM-5: All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other toxic substances will occur in designated non-sensitive upland areas. These areas will implement best management practices to prevent runoff carrying toxic substances from entering the Mississippi River and associated drainages. If a spill occurs outside of a designated area, the cleanup will be immediate and documented.
    - CM-6: Contractor access to the site will only be allowed via the authorized 9-ft Channel

designated navigation channel limits. No access dredging or staging will be allowed outside of the designated navigation channel.

2. Mussel Relocation
   - CM-7: Mussels, including Higgins eye, will be removed out of the construction work limits and placed within favorable habitat containing an existing mussel bed, within the area adjacent to adjacent to the action area along the Iowa side of the navigation channel, away from any future navigation related disturbances. The relocation would be conducted as close to the construction timeline as possible (≤ 60 days) to avoid mussels recolonizing areas prior to construction.
     - Mussels including federally listed species will be removed out of any impact areas and placed within favorable habitat based on parameters proposed in the BA and described in this BO.
     - Mussel relocation effort will be conducted within the Project's impact area as proposed in the BA and described in this BO.
     - Relocation of endangered mussels from the zone of impact shall be collected by hand, under the supervision of a qualified malacologist permitted to handle federally endangered mussels.
     - Collection may not be done when air temperatures are at or below 32°F, nor when water temperatures are at or below 40°F; collection may not be done when air temperatures are at or above 95°F.
     - Mussel relocation activities will be thoroughly coordinated with the construction contractor to ensure that the impact areas are properly identified and cleared of mussels. The Service will be notified prior to conducting the mussel salvage and relocation.
     - All federally listed mussel specimens will be uniquely marked on their shells (or tagged), measured, photographed, aged, sexed, and noted as to their condition and extent of zebra mussel coverage. They will be cleaned of all visible zebra mussels, transported to the release site, and hand-placed in the substrate in a position appropriate for respiration of the animal. Locations will be recorded using Global Positioning System technology or another equally precise method.

Reporting Requirements

Federal agencies have a continuing duty to monitor the impacts of incidental take resulting from their activities [50 CFR 402.14(i)(3)]. In doing so, the Federal agency must report the progress of the action and its impact on the species to the Service as specified below.

1. The Corps or their representative shall notify the project designated Minnesota-Wisconsin Field Office biologist Nick Utrup (nick_utrup@fws.gov) when project construction is initiated and completed within the Action Area.

2. A report will be provided to the Service within 60 days following the relocation effort indicating the numbers and species of mussels that were relocated. For federally listed mussels, report their original locations, where they were relocated to, their sizes, ages, sex, condition, and state of zebra mussel coverage. Habitat conditions at the relocation area must also be documented.

3. The Corps shall notify the Service of any unauthorized activities (regardless of who conducted said activities) or emergencies, or if circumstances result in conservation measures not being implemented, resulting in any adverse impacts not described in the BA and addressed in this Opinion. This notification shall be made within 48 hours or sooner, if possible.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this Opinion or our shared responsibilities under the ESA, pleasecontact Nick Utrup at (612) 600-6122 or nick_utrup@fws.gov.

LITERATUTURE CITED

Baker, F.C. 1928. The freshwater Mollusca of Wisconsin. Part II. Pelecypoda. Bulletin of the Wisconsin Geological and Natural History Survey, No. 70. 495 p.

Coker, R. E. 1919. Fresh-water mussels and mussel industries of the United States. U.S. Department of the Interior, Washington, DC, Bureau of Fisheries, Doc. No. 805, Appx. VIII, 28 pp.

EnviroScience. 2024. Final report: Mussel surveys for proposed Navigation and Ecosystem Sustainability Program (NESP) mooring facilities, Mississippi River pools 10, 14, and 16. Prepared for U.S. Army Corps of Engineers – St. Paul District. St. Paul, MN. 31 pp.

Garton, D. W., and W. R. Haag. 1993. Seasonal reproductive cycles and settlement patterns of *Dreissena polymorpha* in Western Lake Erie. Pages 111-128 in T. F. Nalepa and D. W. Schloesser, eds. Zebra Mussels: Biology, impacts and control. Lewis Publisher. 810 pp.

Gordon, R. 2001. *Lampsilis higginsii* recovery project; Genoa National Fish Hatchery; 2001. Unpublished Report, Genoa National Fish Hatchery, U.S. Fish and Wildlife Service, Genoa, WI. 10 p.

Holland-Bartels, L. E., and D. L. Waller. 1988. Fish hosts for glochidia of the endangered freshwater mussel *Lampsilis higginsi* Lea (Bivalvia: Unionidae). Malacological Review 21: 119-122.

Hornbach, D. J., P. Baker, and T. Deneka. 1995. Abundance and distribution of the endangered mussel, *Lampsilis higginsi* in the lower St. Croix River, Minnesota and Wisconsin. Final Report to the U.S. Fish and Wildlife Service, Contract # 14-48-000394-1009.

Hove, M.C. and A.R. Kapuscinski. 2002. Recovery information needed to prevent extinction of the federally endangered winged mapleleaf: Early life history of endangered Upper Mississippi River mussels. Department of Fisheries, Wildlife, and Conservation Biology, University of Minnesota, St. Paul, Minnesota. 11 pp.

Illinois Admin. Code. 2019. Title 17: Conservation. Chapter I: Department of Natural Resources. Subchapter b: Fish and Wildlife. Part 830 Commercial fishing and musseling in certain waters of the state. February 27. Available online at https://www.dnr.illinois.gov/adrules/documents/17-830.pdf.

Illinois Department of Natural Resources. 2019. 2019 Illinois Fishing Information. Effective: April 1, 2019 through March 31, 2020. 80pp. Available online at fhttps://www.ifishillinois.org/regulations/2019FishingGuide.pdf.

Illinois Endangered Species Protection Board.2015. Checklist of Illinois endangered and threatened animals and plants. 2015. 10pp. Available online at https://www.dnr.illinois.gov/ESPB/Documents/2015_ChecklistFINAL_for_webpage_051915.pdf

IAC. 2009. Chapter 77. 571-77.2 Endangered, threatened, and special concern animals. https://www.legis.iowa.gov/docs/ACO/rule/571.77.2.pdf.

Iowa Department of Natural Resources (IA DNR). 2014. Iowa Commercial Fishing Laws. Des Moines, Iowa.

Kelner, D.E. 2024. Distribution and Relative Abundance of Upper Mississippi and Illinois River Mussels. U.S. Army Corps of Engineers, St. Paul, Minnesota.

Miller, A. C., and B. S. Payne. 2001. Effects of zebra mussels (*Dreissena polymorpha*) at Essential Habitats for *Lampsilis higginsi* in the upper Mississippi River System, 2000. Report for St. Paul District, U.S. Army Corps of Engineers. 31 p.

Miller, A. C., et al. 1996. Effects of increased commercial traffic on freshwater mussels in the Upper Mississippi River: 1994 studies.

Minnesota Department of Natural Resources (MNDNR) 2020. Threats to Mussels Website Accessed January 6, 2020. Available online at https://www.dnr.state.mn.us/mussels/threats.html.

Minnesota Statues. 2019. Chapter 97C Fishing. 43pp. Available online at https://www.revisor.mn.gov/statutes/cite/97C/pdf.

Ricciardi, A., R. J. Neves, and J. B. Rasmussen. 1998. Impending extinctions of North American freshwater mussels (Unionoida) following the zebra mussel (*Dreissena polymorpha*) invasion. Journal of

Animal Ecology 67:613-619.

Thiel, P.A. and A.W. Fritz. 1993. Mussel harvest and regulations in the Upper Mississippi River System. Pages 11-18 in: Conservation and Management of Freshwater Mussels, Proceedings of a Symposium Organized by the Upper Mississippi River Conservation Committee. K.S. Cummings, A.C. Buchanan and L.M. Koch (Editors). Rock Island, IL.

U.S. Army Corps of Engineers (USACE). 2004. Draft Upper Mississippi River-Illinois Waterway Navigation Feasibility Study with Draft Environmental Impact Statement. Rock Island District, St. Louis District, St. Paul District, and New Orleans District.

U.S. Fish and Wildlife Service (USFWS). 1983. Higgins Eye mussel recovery plan. Ft. Snelling, Minnesota. 98 pp.

U.S. Fish and Wildlife Service. 2000. Biological Opinion for the Operation and Maintenance of the 9-Foot Navigation Channel on the Upper Mississippi River System, May 15, 2000, 243 pages.

U.S. Fish and Wildlife Service (USFWS). 2004. Higgins' Eye Pearlymussel (*Lampsilis higginsii*). Final Recovery Plan: First Revision. Ft. Snelling, Minnesota. 126pp.

U.S. Fish and Wildlife Service (USFWS). 2008. Higgins eye Essential Habitat Areas Update. Report by P. Delphey, Ft. Snelling, Minnesota. 98 pp.

U.S. Fish and Wildlife Service (USFWS). 2020. Higgins eye (Pearlymussel) (*Lampsilis higginsii*) 5-Year Review: Summary and Evaluation. Minnesota-Wisconsin Field Office, Bloomington, Minnesota. 28pp.

Waters, S. J. 1980. The evolution of mussel harvest regulations on the Upper Mississippi River. In: Rasmussen, J.L., editor. Proceedings of the UMRCC Symposium on Upper Mississippi River bivalve mollusks. Upper Mississippi River Conservation Committee, Rock Island, Illinois. p. 191-202.

Whitney, S.D., K.D. Blodgett, and R.E. Sparks. 1995. Update of zebra mussels and native unionids in the Illinois River. Report released by the Illinois Natural History Survey, Havana, IL. January 3, 1995

Wisconsin Department of Natural Resources (WIDNR). 2020. Clamming (mussels) Regulations. Website accessed January 6, 2020. Available online at https://dnr.wi.gov/topic/fishing/regulations/musselregs.html.

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

UPPER MISSISSIPPI RIVER
MOORING FACILITIES

POOL 10
CLAYTON COUNTY, IOWA

APPENDIX F

STATE OF IOWA STATE LISTED SPECIES

IOWA DEPARTMENT OF NATURAL RESOURCES NATURAL AREAS INVENTORY

N

Listed Species In a County

<< Back To Query Page

CLAYTON County, IA N

ummary by p i s Report

Total Unique Listed Species In This County: 117

County	Common me	i ntifi me	Cl ss N	t t t tus	F d r l t tus	Link To p i s Profil
CLAYTON	Mudpuppy N	ecturus maculosus	AMPHIBIA S N	T N		PDF
CLAYTON	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
CLAYTON	Barn Owl	Tyto alba	BIRDS	E		PDF
CLAYTON	Henslow's Sparrow	Ammodramus henslowii	BIRDS	T		PDF
CLAYTON	Red-shouldered Hawk	Buteo lineatus	BIRDS N	E		PDF
CLAYTON	American Brook Lamprey	Lampetra appendix	FISH	T N		PDF
CLAYTON	Black Redhorse	Moxostoma duquesnei N	FISH	T N		PDF
CLAYTON	Bluntnose Darter	Etheostoma chlorosoma N	FISH N	E		PDF
CLAYTON	Burbot N	Lota lota	FISH	T N		PDF
CLAYTON	Chestnut Lamprey	Ichthyomyzon castaneus	FISH	T		PDF
CLAYTON	Grass Pickerel	Esox americanus	FISH	T		PDF
CLAYTON	Lake Sturgeon	Acipenser fulvescens	FISH N	E		PDF
CLAYTON	Least Darter	Etheostoma microperca	FISH	E N		PDF
CLAYTON	Pugnose Minnow	Opsopoeodus emiliae	FISH	S		PDF
CLAYTON	Weed Shiner N	otropis texanus N	FISH	E		PDF
CLAYTON	Western Sand Darter	Ammocrypta clara	FISH N	T N		PDF
CLAYTON	Butterfly N	Ellipsaria lineolata	FRESHWATER MUSSELS	T N		
CLAYTON	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		
CLAYTON	Higgin's-eye Pearly Mussel	Lampsilis higginsii	FRESHWATER N MUSSELS	E	E N	
CLAYTON	Pistolgrip	Tritogonia verrucosa	FRESHWATER MUSSELS	E		
CLAYTON	Purple Wartyback	Cyclonaias tuberculata	FRESHWATER MUSSELS	T		
CLAYTON	Round Pigtoe	Pleurobema sintoxia	FRESHWATER N MUSSELS	E		
CLAYTON	Sheepnose	Plethobasus cyphyus	FRESHWATER MUSSELS	E N	E	
CLAYTON	Yellow Sandshell	Lampsilis teres	FRESHWATER N MUSSELS	E		
CLAYTON	Columbine Dusky Wing	Erynnis lucilius N	I SECTS N	S		
CLAYTON	Striped Hairstreak	Satyrium liparops	I SECTS N	S		
CLAYTON	Wild Indigo Dusky Wing	Erynnis baptisiae	I SECTS	S		
CLAYTON	Southern Flying Squirrel	Glaucomys volans	MAMMALS	S		PDF
CLAYTON	Spotted Skunk	Spilogale putorius	MAMMALS N	E N		PDF N

CLAYTON	Al l Bucktho n	Rh mnus lni oli	LANTS (DICOTS					a P
CLAYTON	Blu Gi nt Hyssop	Ag st ch o niculum	PLANTS (DICOTS					
CLAYTON	Bog B st w	G lium l b o icum	PLANTS (DICOTS					
CLAYTON	Bog Bi ch	B tul pumil	LANTS (DICOTS					
CLAYTON	Bog Willow	S lix p ic ll is	PLANTS (DICOTS			PDF		
CLAYTON	Bunchb y)	Co nus c n nsis	PLANTS (DICOTS			PDF		
CLAYTON	C n Plum	P unus nig	LANTS (DICOTS					
CLAYTON	E l Foxglov	omanth u icul t	PLANTS (DICOTS	e T				
CLAYTON	F ls Me mai - w e	Flo k p os pin coi s	PLANTS (DICOTS			PDF		
CLAYTON	Fl t Top Whit Ast	Ast pub ntio	LANTS (DICOTS					
CLAYTON	F ost G r p	itis vulpin	LANTS (DICOTS					
CLAYTON	Gol n S xi g	h ysospl nium iow ens	PLANTS (DICOTSe C			PDF		
CLAYTON	G p -st mme Cl matis	Cl matis occi nt lis)	PLANTS (DICOTS					
CLAYTON	G n Viol t)	Hyb nthus concolo	LANTS (DICOTSP					
CLAYTON	H g N ttl)	t chys sp)	LANTS (DICOTS					
CLAYTON	J w el Shooting St	Do c th on methystinum)	PLANTS (DICOTS			PDF		
CLAYTON	Ki n y-l Whit Viol t	Viol ni oli)	LANTS (DICOTS			PDF		
CLAYTON	Low Bin w e	lyst gi spith ma	PLANTS (DICOTS					d C
CLAYTON	Low Sw e t) Blu b y	V ccinium) ngusti olium	PLANTS (DICOTS			PDF		
CLAYTON	Mount in M apl	c spic tum	PLANTS (DICOTS		e A			
CLAYTON	Musk oot	A ox mosch t llin	LANTSR(DICOTS					
CLAYTON	No th n Bl ck Cu nt	Rib s hu soni num	PLANTS (DICOTS					
CLAYTON	No th n Lungwo t	M t nsi p nicul t	LANTS (DICOTS					
CLAYTON	No th n Monkshoo	Aconitum nov bo c ns	PLANTS (DICOTS	T)		PDF		
CLAYTON	P ly Ev l sting	An ph lis ma g it c	PLANTS (DICOTS					
CLAYTON	Pin s p	Monot op hypopithys	PLANTS (DICOTS					
CLAYTON	P ickly Ros)	os cicul is	PLANTS (DICOTS					
CLAYTON	Rough B st w	G lium sp llum)	PLANTS (DICOTS					
CLAYTON	S g Willow	S lix c n i	LANTS (DICOTS					
CLAYTON	S sk toon S vic -b y	Amel nchi lni oli	PLANTS (DICOTS					
CLAYTON	Sh bush	Amel nchi s nguin	PLANTS (DICOTS					
CLAYTON	Snowb y	Sympho ic pos lbus	PLANTS (DICOTS					
CLAYTON	Spu g	upho bi commut t	PLANTS (DICOTS					
CLAYTON	Summe G r p	itis stiv lis	PLANTS (DICOTS					e V
CLAYTON	Sw e t In i n Pl nt in	C c li su v ol ns	PLANTS (DICOTS					
CLAYTON	Twin low e	inn bo lis	PLANTS (DICOTS					
CLAYTON	Twinl	soni iphyll	LANTS (DICOTS	a P				
CLAYTON	Upl n Bon s t	Eup to ium s ssili olium	PLANTS (DICOTS					
CLAYTON	V l i n	V l i n ulis)	PLANTS (DICOTS					
CLAYTON	V lv t L Blu b y	V ccinium my tilloi s	PLANTS (DICOTS					
CLAYTON	B ls m Fi)	bi s b ls me	LANTS (GYMNOSPERMS	S		PDF		

CLAYTON	B B e rass	P a pa di ena c	PLANTS (MONOCOTS)	S		PDF	
CLAYTON	Carey Sed e c	Carex areyana	PLANTS (MONOCOTS)	S			
CLAYTON	Dr pin B e rass c	P a an ida c	PLANTS (MONOCOTS)	S			
CLAYTON	Grass Pink c	Ca p n c t ber s s	PLANTS (MONOCOTS)	S		PDF	
CLAYTON	Hidden Sed e	Carex mbe ata	PLANTS (MONOCOTS)	S			
CLAYTON	H ker's Or hid	P atanthera h keri	PLANTS (MONOCOTS)	T			
CLAYTON	Intermediate Sed e	Carex media	PLANTS (MONOCOTS)	S			
CLAYTON	Mead w B e rass	P a w ofii	PLANTS (MONOCOTS)	S			
CLAYTON	M ntain Ri e rass	Oryz psis asperif ia	PLANTS (MONOCOTS)	S			
CLAYTON	N ddin Oni n c	A i m ern mc	PLANTS (MONOCOTS)	T			
CLAYTON	N rthern Pani - rass	Di hanthe i m b rea e	PLANTS (MONOCOTS)	E			
CLAYTON	Ovate Spiker sh	E e haris vata	PLANTS (MONOCOTS)	S			
CLAYTON	Ri hards n Sed e	Carex ri hards nii	PLANTS (MONOCOTS)	S			
CLAYTON	R sy Twisted Sta k	Strept p s r se s	PLANTS (MONOCOTS)	T			
CLAYTON	Sed e	Carex epha antha	PLANTS (MONOCOTS)	S c			
CLAYTON	Sh wy Lady's S ipper	Cypripedi m re inae	PLANTS (MONOCOTS)	T			
CLAYTON	S ender M o ntain- ri e rass	Oryz psis p n ens	PLANTS (MONOCOTS)	E			
CLAYTON	S mon's Sea	y nat m p bes ens	PLANTS (MONOCOTS)	S			P
CLAYTON	Sp tted C ra r t	C ra rhiza ma ata	PLANTS (MONOCOTS)	T			
CLAYTON	Steri e Sed e	Carex steri is	PLANTS (MONOCOTS)	S			
CLAYTON	Ta C tt n Grass	Eri ph r m an stif i m	PLANTS (MONOCOTS)	S			
CLAYTON	Western Prairie Frin ed Or hid	P atanthera c prae ara	PLANTS (MONOCOTS)	T	T c	PDF	
CLAYTON	Ye w Tr t- i y	Erythr ni m ameri an m	PLANTS (MONOCOTS)	T			
CLAYTON	Cinnamon Fern	Osmunda innamomea c	PLANTS (PTERIODOPHYTES)	E			
CLAYTON	Cr wf t C bmoss	Ly p di mc di itat m	PLANTS (PTERIODOPHYTES)	S			
CLAYTON	Dwarf S rin - r sh	Eq iset m s irp ides	PLANTS c (PTERIODOPHYTES)	S c			
CLAYTON	G and ar Wo d Fern	Dry pteris intermedia	PLANTS (PTERIODOPHYTES)	T			
CLAYTON	Leathery Grape Fern	B try hi m mu tifid m	PLANTS (PTERIODOPHYTES)	T			
CLAYTON	Led e Spikemoss	Se a ine a r pestris	PLANTS (PTERIODOPHYTES)	S c			
CLAYTON	Limest ne Oak Fern c	Gymn arpi m r bertian mc	PLANTS (PTERIODOPHYTES)	S		PDF	
CLAYTON	N rthern Adder's- t n c e	Ophi ss m p si mc	PLANTS (PTERIODOPHYTES)	S			
CLAYTON	Oak Fern	Gymn arpi mc dry pteris	PLANTS (PTERIODOPHYTES)	T			
CLAYTON	P rp e C iff-brake Fern	Pe aea atr p rp rea	PLANTS c (PTERIODOPHYTES)	E c			
CLAYTON	R k C bmoss	Ly p di m p r phi m	PLANTS (PTERIODOPHYTES)	T			
CLAYTON	Tree C bmoss	Ly p di m dendr ide m	PLANTS (PTERIODOPHYTES)	T			
CLAYTON	B andin 's T rt e	Emyd idea b andin ii	REPTILES	T		PDF	
CLAYTON	B snake	Pit phis atenifer sayi	REPTILES	S c		PDF	
CLAYTON	C mmon M usk T rt e	Stern ther s d rat s	REPTILES	T		PDF	
CLAYTON	Ornate B x T rt e	Terrapene rnata	REPTILES c	T c		PDF	c

CLAYTON	B ertigo V		ertigo meramecensis		SNAILS		E	
CLAYTON	Briarton P eistoscene ertigo		ertigo brierensis		SNAILS	H	E	
CLAYTON	Frigid Ambersnai		atine a ge ida	l S	SNAILS		E	
CLAYTON	bricht's ertigo V		ertigo h brichti		SNAILS		T	
CLAYTON	Iowa P eistocene Snai		Disc s macc intocki		SNAILS	H	E H	E
CLAYTON	Iowa P eistocene H ertigo		ertigo iowaensis		SNAILS	H	E H	
CLAYTON	Midwest P eistocene	ertigo h brichti	ertigo h brichti		SNAILS		T	
CLAYTON	ariab e P eistocene	ertigo variabi is	ertigo h brichti		SNAILS	H	T	

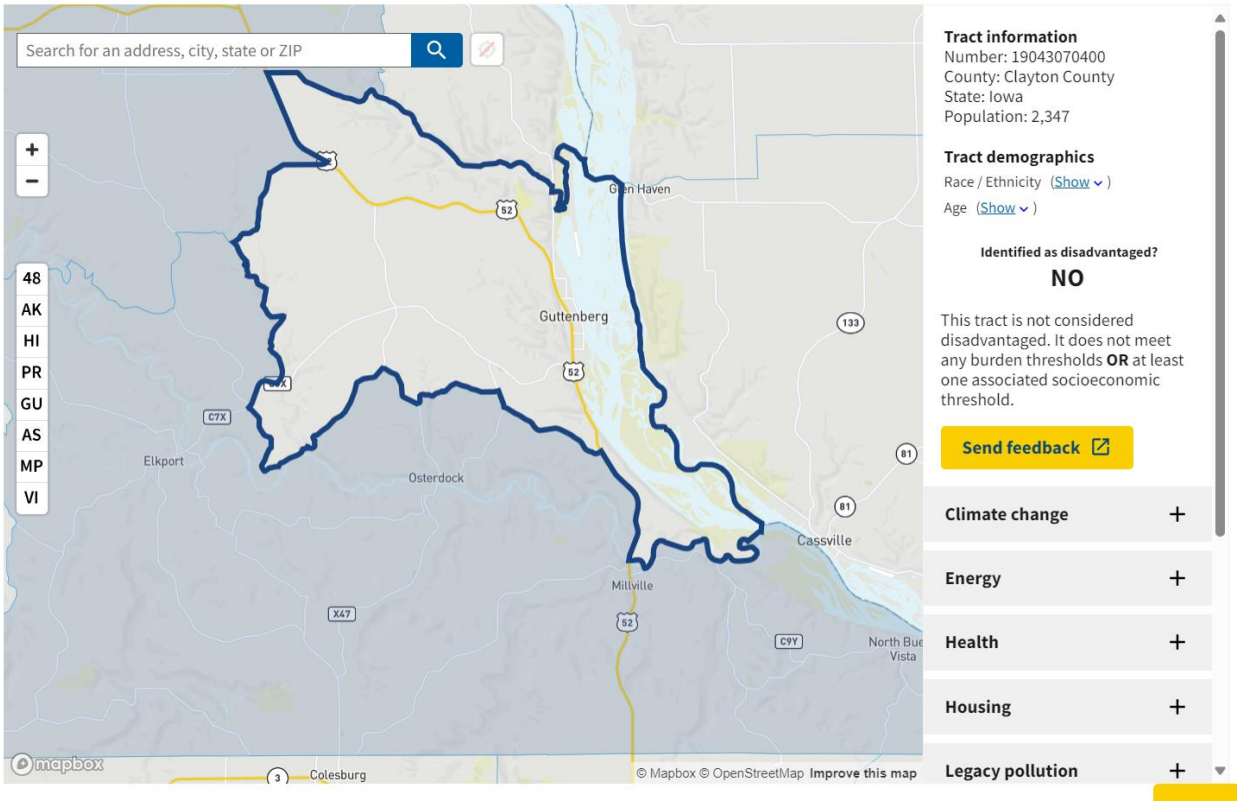
NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

UPPER MISSISSIPPI RIVER
MOORING FACILITIES

POOL 10
CLAYTON COUNTY, IOWA

APPENDIX G

ENVIRONMENTAL JUSTICE

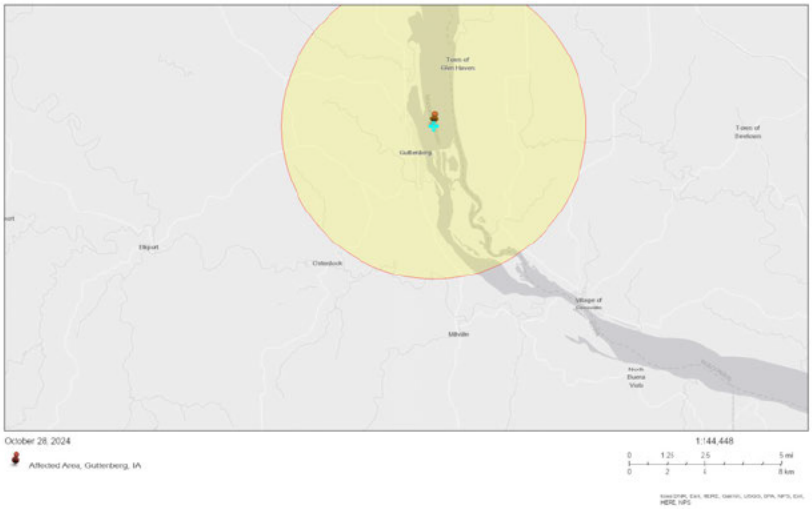

Search for an address, city, state or ZIP
48
AK
HI
PR
GU
AS
MP
VI
Guttenberg
Elkport
Osterdock
Millville
Cassville
Colesburg
C7X
X47
C9Y
52
81
133
mapbox
© Mapbox © OpenStreetMap Improve this map
Tract information
Number: 19043070400
County: Clayton County
State: Iowa
Population: 2,347
Tract demographics
Race / Ethnicity (Show)
Age (Show)
Identified as disadvantaged?
NO
This tract is not considered disadvantaged. It does not meet any burden thresholds OR at least one associated socioeconomic threshold.
Send feedback
Climate change
Energy
Health
Housing
Legacy pollution

EJScreen Communit Re ort

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes. M

Affected Area, Guttenberg, IA M

5 miles Ring Centered at 42.797927,-91.089996
Population: 2,499
Area in square miles: 78.53



LANGUAGES S EN A OME M

LANGUAGE	PERCENT
English	98%
Spanish	1%
German or other West Germanic	1%
Total Non-English	2%

CO UNITY INFOR TIO N

Low income: 30 percent
People of color: 3 percent
Less than high school education: 7 percent
Limited English households: 0 percent
Unemployment: 2 percent
Persons with disabilities: 18 percent
Male: 44 percent
Female: 56 percent
79 years
Average life expectancy
$36,646
Per capita income
Number of households: 1,196
Owner occupied: 80 percent

REAKM OW Y RA E

White: 97%
Black: 0%
American Indian: 0%
Asian: 0%
Hawaiian/Pacific Islander: 0%
Other race: 0%
Two or more races: 1%
Hispanic: 2%

REAKDOWN BY AGE

From Ages 1 to 4	4%
From Ages 1 to 18	17%
From Ages 18 and up	83%
From Ages 65 and up	28%

LI M TED ENGLISH SPEAKI G REAK OWN M

Speak Spanish	59%
Speak Other Indo-European Languages	41%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. M
Source: U.S. Census Bureau, American Community Survey (ACS) 2018-2022. Life expectancy data comes from the Centers for Disease Control.

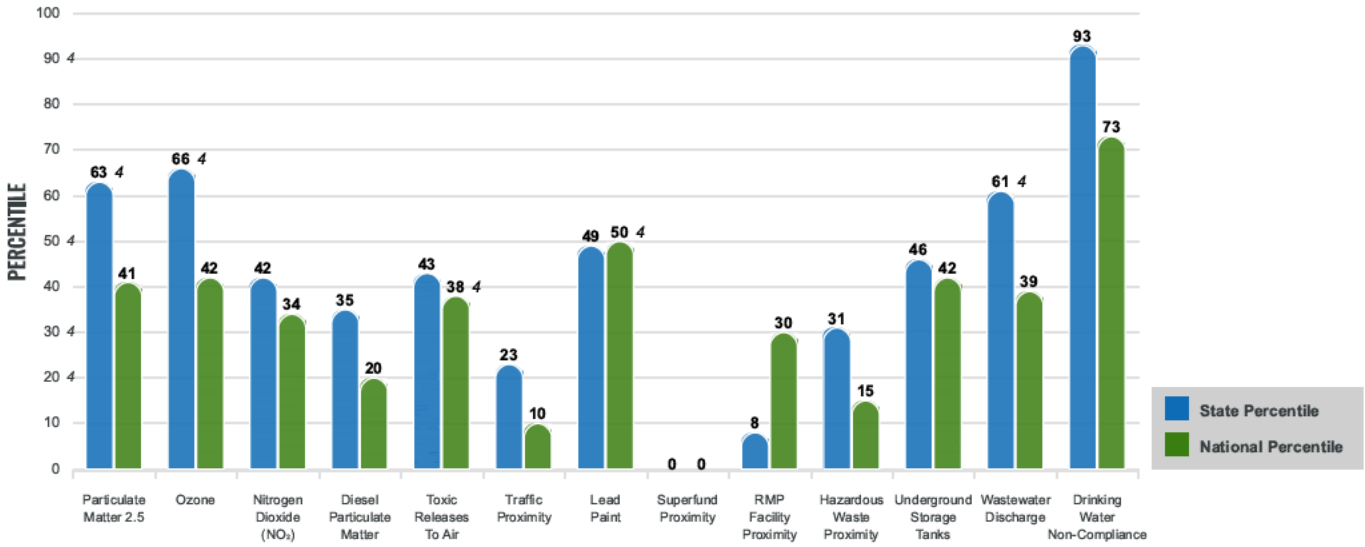
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES *4*

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

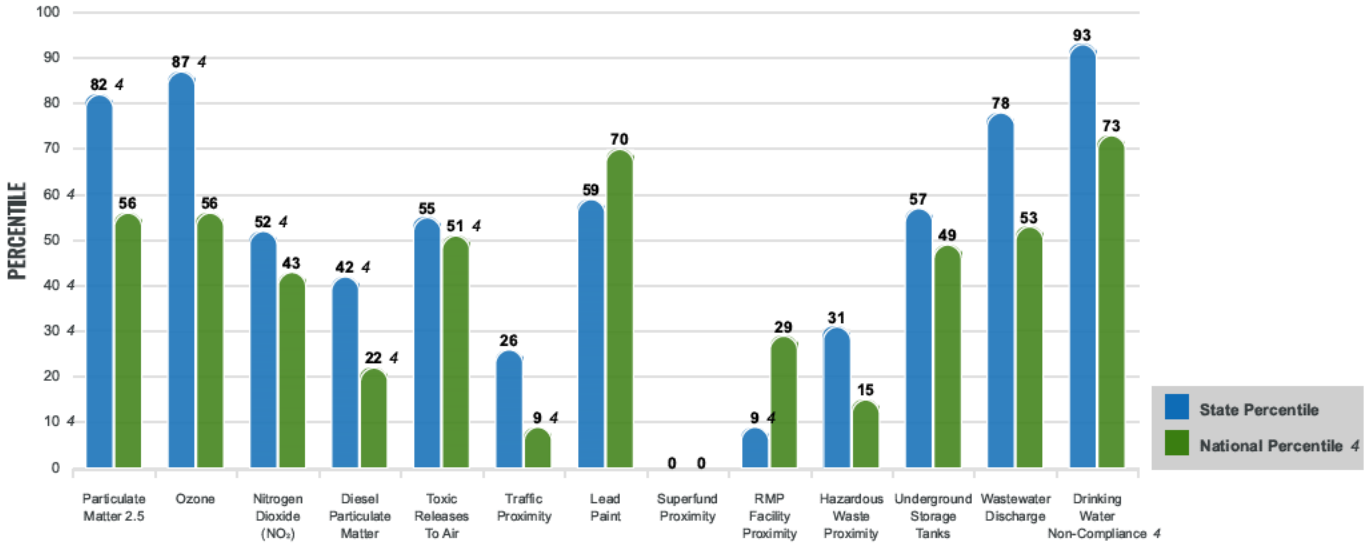
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES *4*

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low income, percent persons with disabilities, percent less than high school education, percent limited English speaking, and percent low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



Report for 5 miles Ring Centered at 2.797927,-91.089996

Report produced October 28, 202 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
ENVIRONMENTAL BURDEN INDICATORS					
Particulate Matter 2.5 ($\mu g/m^3$)	8.12	7.66	72	8.45	48
Ozone (ppb)	59.7	57.9	80	61.8	46
Nitrogen Dioxide (NO_2) (ppbv)	6	7	37	7.8	33
Diesel Particulate Matter ($\mu g/m^3$)	0.075	0.113	27	0.191	18
Toxic Releases to Air (toxicity-weighted concentration)	390	2,800	39	4,600	42
Traffic Proximity (daily traffic count/distance to road)	29,000	1,400,000	18	1,700,000	9
Lead Paint (% Pre-1960 Housing)	0.41	0.45	43	0.3	67
Superfund Proximity (site count/km distance)	0	0.16	0	0.39	0
RMP Facility Proximity (facility count/km distance)	0.055	0.89	6	0.57	28
Hazardous Waste Proximity (facility count/km distance)	0.013	0.62	31	3.5	15
Underground Storage Tanks (count/km^2)	0.4	1.9	45	3.6	42
Wastewater Discharge (toxicity-weighted concentration/m distance)	30	1100	65	700000	45
Drinking Water Non-Compliance (points)	0.17	0.16	94	2.2	74
SOCIOECONOMIC INDICATORS					
Demographic Index USA	0.76	N/A	N/A	1.34	29
Supplemental Demographic Index USA	1.68	N/A	N/A	1.64	58
Demographic Index State	0.95	1.31	41	N/A	N/A
Supplemental Demographic Index State	1.71	1.46	71	N/A	N/A
People of Color	3%	15%	19	40%	8
Low Income	30%	29%	59	30%	56
Unemployment Rate	2%	4%	50	6%	38
Limited English Speaking Households	0%	2%	70	5%	56
Less Than High School Education	7%	8%	62	11%	48
Under Age 5	4%	6%	35	5%	43
Over Age 64	28%	19%	85	18%	84

*Diesel particulate matter index is from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensi e e aluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here pro ide broad estimates of health risks o er geographic areas of the country, not definitive risks to specific indi iduals or locations. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	3
Air Pollution	3
Brownfields	0
Toxic Release Inventory	0

Other community features within defined area:

Schools	3
Hospitals	4
Places of Worship	5

Other environmental data:

Air Non-attainment	No
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	Yes
Selected location contains an EPA IRA disadvantaged community	Yes

Report for 5 miles Ring Centered at 42.797927,-91.089996

Report produced October 28, 2024 using EJScreen Version 2.3 v

HEALTH INDICATORS					
INDICATOR	**VALUE**	**STATE AVERAGE**	**STATE PERCENTILE**	**US AVERAGE**	**US PERCENTILE**
Low Life Expectancy	21%	19%	73	20%	64
Heart Disease	7.9	5.9	93	5.8	87
Asthma	9.1	9.6	27	10.3	19
Cancer	9.6	7.3	96	6.4	96
Persons with Disabilities	17.6%	12.8%	86	13.7%	76

CLIMATE INDICATORS					
INDICATOR	**VALUE**	**STATE AVERAGE**	**STATE PERCENTILE**	**US AVERAGE**	**US PERCENTILE**
Flood Risk	22%	11%	92	12%	87
Wildfire Risk	0%	2%	0	14%	0

CRITICAL SERVICE GAPS					
INDICATOR	**VALUE**	**STATE AVERAGE**	**STATE PERCENTILE**	**US AVERAGE**	**US PERCENTILE**
Broadband Internet	15%	14%	58	13%	66
Lack of Health Insurance	4%	5%	54	9%	32
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access Burden	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

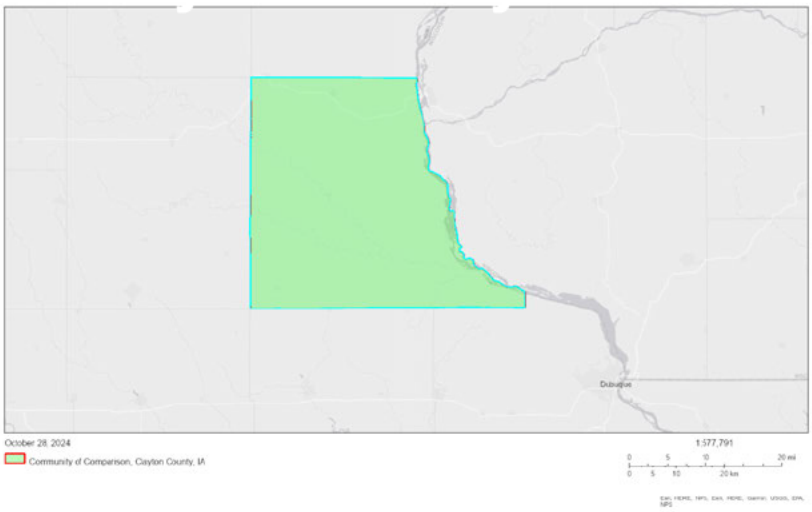
Report for e R ng Centered at 42.797927,-91.089996
RepOO produced tober 28, 2024 u ng EJScreen Ver on 2.3

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes. O

Community of Comparison,

County: Clayton
Population: 17,123
Area in square miles: 792.63



C MMNITY INF MATI N

Low income: 29 percent	People of color: 5 percent	Less than high school education: 9 percent	Limited English households: 1 percent
Unemployment: 3 percent	Persons with disabilities: 15 percent	Male: 51 percent	Female: 49 percent
80 years Average life expectancy	$34,394 Per capita income	Number of households: 7,286	Owner occupied: 75 percent

B EA D WBY ACE

White: 95%	Black: 0%	American Indian: 0%	Asian: 0%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 2%	Hispanic: 2%

LANGUAGES S O EN A O O

LANGUAGE	PERCENT
English	93%
Spanish	3%
German or other West Germanic	3%
Total Non-English	7%

BRE AKDOWN BY AGE

From Ages 1 to 4	6%
From Ages 1 to 18	21%
From Ages 18 and up	79%
From Ages 65 and up	24%

LIMITED ENGLISH SPEAK NG B EA D WN

Speak Spanish	71%
Speak Other Indo-European Languages	22%
Speak Asian-Pacific Island Languages	7%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2018-2022. Life expectancy data comes from the Centers for Disease Control.

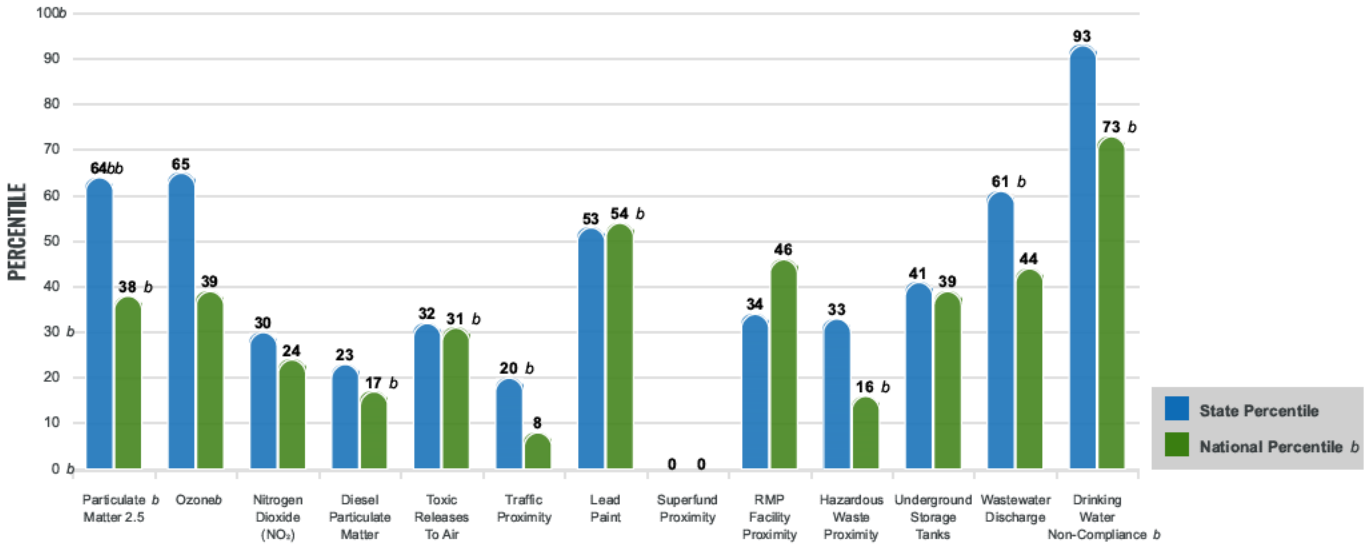
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES *b*

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

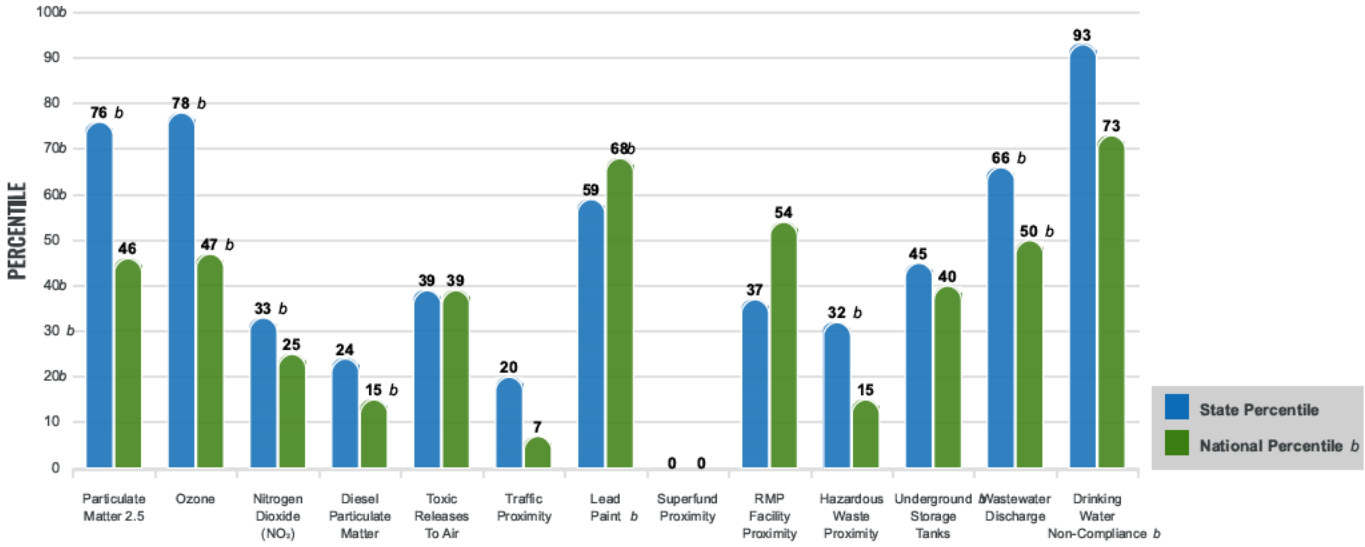
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low income, percent persons with disabilities, percent less than high school education, percent limited English speaking, and percent low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



Report for County: Clayton

Report produced Octo er 28, 2024 using EJScreen Version 2.3

E Screen Environmental and Socioeconomic Indicators Data v

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
ENVIRONMENTAL BURDEN INDICATORS					
Particulate Matter 2.5 ($\mu g/m^3$)	7.97	7.66	69	8.45	43
Ozone (ppb)	59.1	57.9	68	61.8	43
Nitrogen Dioxide (NO_2) (ppbv)	4.8	7	23	7.8	21
Diesel Particulate Matter ($\mu g/m^3$)	0.0681	0.113	17	0.191	15
Toxic Releases to Air (toxicity-weighted concentration)	260	2,800	29	4,600	36
Traffic Proximity (daily traffic count/distance to road)	30,000	1,400,000	18	1,700,000	9
Lead Paint (% Pre-1960 Housing)	0.49	0.45	52	0.3	73
Superfund Proximity (site count/km distance)	0	0.16	0	0.39	0
RMP Facility Proximity (facility count/km distance)	0.36	0.89	31	0.57	56
Hazardous Waste Proximity (facility count/km distance)	0.056	0.62	32	3.5	15
Underground Storage Tanks (count/km^2)	0.25	1.9	40	3.6	38
Wastewater Discharge (toxicity-weighted concentration/m distance)	9300	1100	96	700000	88
Drinking Water Non-Compliance (points)	0.47	0.16	94	2.2	75
SOCIOECONOMIC INDICATORS					
Demographic Index USA	0.75	N/A	N/A	1.34	29
Supplemental Demographic Index USA	1.49	N/A	N/A	1.64	46
Demographic Index State	0.98	1.31	43	N/A	N/A
Supplemental Demographic Index State	1.52	1.46	60	N/A	N/A
People of Color	5%	15%	28	40%	11
Low Income	29%	29%	57	30%	54
Unemployment Rate	3%	4%	52	6%	40
Limited English Speaking Households	1%	2%	72	5%	57
Less Than High School Education	9%	8%	72	11%	56
Under Age 5	6%	6%	55	5%	59
Over Age 64	24%	19%	75	18%	77

*Diesel particulate matter index is from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensi e e aluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here pro ide broad estimates of health risks o er geographic areas of the country, not definitive risks to specific indi iduals or locations. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	20
Air Pollution	33
Brownfields	8
Toxic Release Inventory	4

Other community features within defined area:

Schools	11
Hospitals	24
Places of Worship	51

Other environmental data:

Air Non-attainment	No
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	Yes
Selected location contains an EPA IRA disadvantaged community	Yes

Report for County: Clayton

Report produced October 28, 2024 using EJScreen Version 2.3 v

HEALTH INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low LIfe Expectancy	18%	19%	37	20%	34
Heart DIsease	7.6	5.9	91	5.8	84
Asthma	9.5	9.6	62	10.3	30
Cancer	8.5	7.3	81	6.4	90
Persons wIth DIsabIlItIes	15.3%	12.8%	74	13.7%	65

CLIMATE INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood RIsk	17%	11%	81	12%	82
WIldfire RIsk	0%	2%	0	14%	0

CRITICAL SERVICE GAPS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	19%	14%	72	13%	75
Lack of Health Insurance	7%	5%	78	9%	52
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access Burden	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for o t la to
Report prod ced October 28, 2024 si g EJScree Versio 2 3 .