

Feasibility Report and
Integrated Environmental Assessment

Pool 5 Dredged Material Management Plan

Upper Mississippi River
Wabasha and Winona Counties, Minnesota
Buffalo County, Wisconsin



**US Army Corps
of Engineers**
St. Paul District

November 2019

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ACRONYMS

CEQ – Council of Environmental Quality
CFS – Cubic Feet per Second
CMMP – Channel Maintenance Management Plan
CWA – Clean Water Act
CY – Cubic Yards
DMMP – Dredged Material Management Plan
DNR – Department of Natural Resources
EA – Environmental Assessment
EIS – Environmental Impact Statement
END – Endangered
ER – Engineer Regulation
FY – Fiscal Year
GHG – Greenhouse Gas
GIS – Geographic Information System
GREAT – Great River Environmental Action Team
HTRW – Hazardous, Toxic, and Radioactive Waste
Hyd – Hydraulic
IPaC – Information for Planning Conservation
IWW – Illinois Waterway
L/D – Lock and Dam
LG – Local Group
Mech – Mechanical
MNHIS – Minnesota Natural Heritage Information System
MPCA – Minnesota Pollution Control Agency
MOU – Memorandum of Understanding
NAAQS – National Ambient Air Quality Standards
NEPA – National Environmental Policy Act
NRCS – Natural Resources Conservation Service
NRHP – National Register of Historic Places
PA – Programmatic Agreement
PAH – Polyaromatic Hydrocarbon
PCB – Polychlorinated Biphenyl
RM – River Miles
SC – Special Concern
SDS – Solid Waste Disposal Site
SHPO – State Historic Preservation Office
SRV – Soil Reference Value
SQT – Sediment Quality Target
THR – Threatened
TNC – The Nature Conservancy
T&E – Threatened and Endangered
UMR – Upper Mississippi River
USACE – U.S. Army Corps of Engineers
USEPA – U.S. Environmental Protection Agency
USFWS – U.S. Fish and Wildlife Service
USGS – U.S. Geological Survey

Executive Summary

The purpose of this Dredged Material Management Plan (DMMP) is to prepare a coordinated, long-term plan for managing material dredged in Pool 5 of the Upper Mississippi River (UMR) for the purposes of continued operation and maintenance of the 9-foot Navigation Channel Project. This plan was initiated due to a change in the availability of dredged material placement sites in Pool 5. There are nine active dredge cuts in Pool 5 where maintenance dredging has occurred since 1970, with around 4.7 million cubic yards (CY) of material dredged between 1981 and 2018.

The U.S. Army Corps of Engineers, St. Paul District evaluated the management of material dredged from the nine dredge cuts at a number of existing (historic) and potential dredged material placement sites in the vicinity of Pool 5 on the UMR. Placement sites were evaluated using factors such as cost effectiveness, environmental acceptability, and operational feasibility. The Corps assessed current local land uses and contacted land owners to develop a list of sites potentially suitable for permanent placement of dredged material. Once identified, sites were evaluated based on aspects of environmental acceptability, operational feasibility and estimated costs.

Finally, alternative plans were developed that would meet the study objectives. Historically, a limited amount of beneficial use of dredged material in Pool 5 has been part of management plans. Beneficial use of dredged material employs environmentally and economically responsible methods to use dredged material to benefit local communities and improve eroded shorelines through marsh restoration, beach nourishment, and other beneficial uses when possible (i.e. make material available to the public). The study team decided to formulate alternatives that incorporated permanent upland placement as the long-term goal for most of the material, but to include sites that could provide for some beneficial use. Between 1981 and 2018 the average amount of material dredged per year in Pool 5 was approximately 117,000 CY; however, with the addition of a new dredge cut and an increase in sedimentation, the resulting 40 year target capacity is approximately 4.7 million CY for the Pool 5 DMMP.

The Recommended Plan (RP) for the Pool 5 DMMP has been identified due to it being operationally and economically feasible and environmentally acceptable for dredged material placement. The DMMP study includes the use of the existing West Newton Chute site as a transfer site prior to hauling the material to the selected Rolling Prairie Site. The combined sites are capable of accepting material placed hydraulically and mechanically from Pool 5 for more than 40 years. Additionally, several other property locations have been identified for future dredged material placement opportunities within Pool 5.

Three island sites used in the past for temporary placement are retained in the Recommended Plan. Above West Newton, Fisher Island, and Lost Island would remain available in the future if the permanent placement sites are at capacity, become unavailable for some unforeseen reason, or if it's operationally more feasible to use the island sites.

CHAPTER 1. Introduction

1.1 Authority

The U.S. Army Corps of Engineers is authorized to maintain a navigable channel on the Mississippi River. Authority for continued operation and maintenance of the Mississippi River 9-Foot Channel project is provided in the Rivers and Harbors Acts of 1930 and 1932. Original authority for the Corps of Engineers to work on the Mississippi River was provided in the Rivers and Harbors Act of 1878. In addition, pursuant to Section 1103(i) of the Water Resources Development Act of 1986 (33 U.S.C. § 652(i)), Congress authorized the Corps to dispose of dredged material from the system pursuant to the recommendations of the Great River Environmental Action Team (GREAT) I study, which were implemented, in part, in the Channel Maintenance Management Plan (CMMP). The proposed project is authorized by the referenced legislation and its purpose is compatible with the annual Operations and Maintenance appropriation.

1.2 Scope of Study

The study addresses dredged material management for the navigation channel on the Mississippi River between Lock and Dam (L/D) 4 and L/D 5 between river miles (RM) 752.8 and 738.1 (Figure 1). This project addresses dredge cuts in Pool 5 that currently includes: Upper Zumbro, Mule Bend, West Newton Chute, Below West Newton, Above Fisher Island, Lower Zumbro, Minneiska, Above Mt. Vernon Light, and Below Mt. Vernon Light. Communities located in the project area include Buffalo City, Cochrane, and Alma in Wisconsin, and Kellogg, Minneiska, and Weaver in Minnesota. Most of the floodplain in the study area is located within the Upper Mississippi River National Wildlife and Fish Refuge. The study area includes both the plan reach in river miles defined by the dredge cut areas and the locations of the placement sites that are outside of the reach in order to support projected dredging activities for at least the next 40 years.

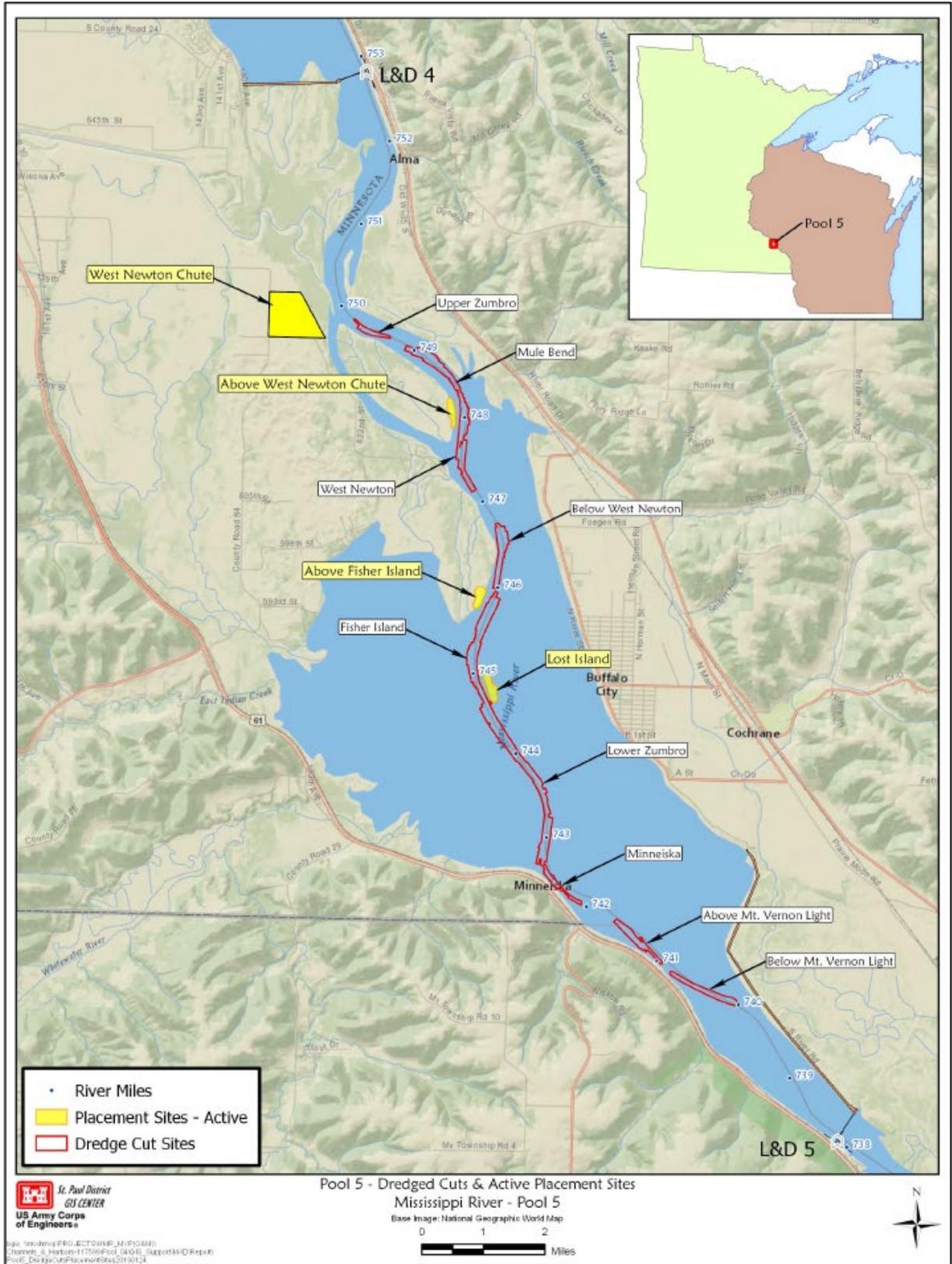


Figure 1. Pool 5 DMMP Study Area and Dredge Cut Locations.

1.3 Purpose and Need

The purpose of this Dredged Material Management Plan (DMMP) is to prepare a coordinated, long-term plan for managing material dredged in Pool 5 of the Upper Mississippi River (UMR) for the purposes of continued operation and maintenance of the 9-Foot Navigation Channel Project. This plan was initiated because permanent dredged material placement sites are nearing capacity and the increased cost associated with managing dredged material over the past 15-20 years. Dredged material placed at temporary island transfer sites will need to be offloaded to a permanent site. Therefore, additional permanent sites are needed to accommodate the Corps' dredging needs in Pool 5 over the next 40 years. The selected plan must comply with Corps policy for managing dredged material pursuant to the Federal Standard. The Federal Standard (33 CFR Part 335.7) for dredged material placement sites is defined as "the dredged material disposal alternative or alternatives identified by the Corps which represent the least costly alternatives consistent with sound engineering practices and meeting the environmental standards established by the 404(b)(1) evaluation process or ocean dumping criteria." The study product is a routine Operations and Maintenance document in the form of an integrated feasibility report and National Environmental Policy Act (NEPA) document in accordance with the Corps' Planning Guidance Notebook, Engineer Regulation (ER) 1105-2-100.

1.4 Related Studies and Reports

Numerous studies and reports are available for the UMR that include Pool 5. The following studies and projects addressing channel maintenance, resource management, land use, and recreational planning in Pool 5 have the most relevance to this study.

1.4.1 9-FOOT NAVIGATION CHANNEL PROJECT ENVIRONMENTAL IMPACT STATEMENT

This document, completed in 1974, assesses the environmental effects of the operation and maintenance of the 9-Foot Navigation Channel project within the St. Paul District.

1.4.2 GREAT RIVER ENVIRONMENTAL ACTION TEAM STUDY (GREAT I)

This nine-volume report (completed in 1980) documents the results of the 5-year GREAT I study for the St. Paul District reach of the Mississippi River (including the head of navigation in Minneapolis, Minnesota, downstream to Guttenberg, Iowa). The report contained numerous recommendations for improved management of the river, the most important of which was a 40 year plan for dredged material placement for all of the historic dredging locations in the St. Paul District. Many of the study's recommendations have been implemented. Most of the dredged material sites the Corps currently uses in Pool 5 were identified in the GREAT I study.

1.4.3 CHANNEL MAINTENANCE MANAGEMENT PLAN (CMMP) AND ENVIRONMENTAL IMPACT STATEMENT (EIS)

This butle CMMP and accompanying environmental impact statement is the St. Paul District's plan for management of channel maintenance (USACE 1997). Much of the plan is devoted to

the designation and design of dredged material placement sites as recommended in the GREAT I study. Included in this report is a discussion of the District's program for channel management. The Pool 5 DMMP is part of that program.

1.4.4 DREDGED MATERIAL MANAGEMENT: LOST ISLAND-WEST NEWTON TRANSFER, UPPER MISSISSIPPI RIVER POOL 5, WABASHA COUNTY MINNESOTA, BUFFALO COUNTY, WISCONSIN ENVIRONMENTAL ASSESSMENT

This 2016 document assesses the environmental effects of offloading the stored dredged material from the Lost Island Temporary Placement Site in Pool 5 to the West Newton Chute Placement Site for permanent placement and beneficial use (USACE 2016a). The project involves transferring up to 1,300,000 CY of material from 2016 to 2019. The project provides future capacity at the Lost Island Temporary Placement Site for dredged material to ensure the continued availability of the 9-foot navigation channel for commercial navigation for the 9-Foot Navigation Channel project within the St. Paul District.

CHAPTER 2.

Affected Environment

A description of components of the nearby environment is discussed here to provide a measure of the current state of the project location. The goal of this chapter is to provide an understanding and context of the resources that may be affected by the alternative actions under consideration. A discussion of the effects of the alternatives under consideration can be found in Chapter 7.

2.1 Socioeconomic Conditions

The cities or communities of Buffalo City and Alma, Wisconsin, and Kellogg, Minneiska and Weaver, Minnesota are located within the study area. Buffalo City is located on the Wisconsin mainland off the main channel at river mile 744, while Alma is located at the upstream end of the study area near river mile 752 at L/D 4. Minneiska is located on the Minnesota mainland at river mile 742 and Kellogg is located approximately 3.5 miles east of river mile 751, south of the Old Zumbro River. There is considerable residential development along the Wisconsin shorelines in Pool 5.

State Hwy 35 parallels the floodplain on the Wisconsin side of the river. The major highway on the Minnesota side, U.S. Hwy 61, is set back from the river a few miles from L/D 4 to Weaver, Minnesota where it parallels the river shoreline southward to L/D 5. Networks of secondary, county, and township roads connect with the primary roads to service the areas adjacent to the pools and to provide access from outlying areas.

Railroads are located along both sides of the valley. On the Wisconsin side, the Burlington Northern railroad tracks lie riverward of State Hwy 35. On the Minnesota side, the Canadian Pacific railroad tracks lie riverward of U.S. Hwy 61 and are set back from the river between L/D 4 and Weaver, MN. South of Weaver, the railroad tracks parallel the Pool 5 shoreline.

The John P. Madgett Station is a coal fired electrical power station located on the river near Alma, Wisconsin in Buffalo County, near river mile 751. The plant burns blended coal that arrives by barge, train and truck from Wyoming and Utah. The barge coal moves by train to St. Louis and then up the Mississippi River about 575 miles to Alma.

There are no interstate bridge crossings in Pool 5. The closest upstream crossing is the Wabasha-Nelson Bridge in Pool 4. It spans the navigation channel between Minnesota and Wisconsin at approximate river mile 760.2 and carries vehicular traffic on two lanes of Minnesota State Hwy 60/Wisconsin State Hwy 25.

The closest crossing downstream of Pool 5 is the Minnesota State Hwy 43/Wisconsin State Hwy 54 bridge at Winona, Minnesota at approximate river mile 725.9.

Alma, Buffalo City and Cochrane, Wisconsin have populations of 781, 1,023, and 450, respectively. Minneiska and Kellogg, Minnesota have populations of approximately 456 and 110, respectively. All populations were derived from the 2010 census.

2.2 Commercial Navigation

Pool 5 is a portion of the Upper Mississippi River–Illinois Waterway (UMR-IWW), which is an important component of the U.S. inland navigation system. The navigation channel in Pool 5 serves as a link for commercial barge traffic moving between ports upstream as far as the St. Paul, Minnesota metropolitan area, downstream as far as New Orleans, Louisiana, and to points east and west on the Ohio and Missouri Rivers. Major types of commercial cargo shipped on the UMR include grain (downstream), fertilizer (upstream), coal (both upstream and downstream), and petroleum products. Between 1997 and 2016, annual barge freight through L/D 5 ranged from 5.7 to 12.7 million tons per year, and averaged 9.2 million tons per year during that period. In 2018 just over 9 million tons of commodities were transported in up-bound and down-bound tows through L/D 5.

Waterway transportation keeps our nation's commerce on the move in the safest, most fuel-efficient, and environmentally sound way. One barge can hold 1,750 tons, 58,333 bushels, or 1,555,000 gallons; whereas one rail car can only handle up to 110 tons, 4,000 bushels, and 33,870 gallons and one large semi can transport up to 25 tons, 910 bushels, and 7,865 gallons. One 15-barge tow carries the equivalent of 6 locomotives and 216 rail cars or 1,050 large semi-trucks. On average, farmers save \$0.97/bushel of corn and \$1.01/bushel of soybeans using barges to transport crops (USACE 2016b).

2.3 Environmental Justice

The U.S. Environmental Protection Agency (USEPA) on-line EJScreen mapping tool (Version 2019) was used to characterize existing conditions for minority and low-income groups. The project broadly occurs across multiple block groups identified through the tool, and includes areas on both sides of the Mississippi River (Wabasha, Co. Minnesota and Buffalo Co. Wisconsin). A block group is a geographical unit used by the United States Census Bureau. It is the smallest geographical unit for which the bureau publishes sample data. The percent minority population within these block groups ranged between 1 and 13%. The percent low income within these block groups ranged from 15 to 41%.

2.4 Recreation

The natural character of this portion of the river and the relatively good water quality in Pool 5 contribute to its recreational and aesthetic desirability. Recreation activities include fishing, recreational boating, hunting, trapping, camping, bird watching, canoeing, island beach use, and sightseeing. There are fourteen public boat landings in Pool 5, with six in Wisconsin and eight in Minnesota (Table 1). The islands and sloughs throughout the pool are popular with recreational boaters.

The Upper Mississippi River National Wildlife and Fish Refuge provides high quality wildlife habitat in this reach. The backwater areas of Pool 5 provide good waterfowl hunting. Backwater and channel habitats provide for a variety of fishing opportunities. Weaver Bottoms is a popular location for watching waterfowl during the migration season.

Table 1. Recreation Areas Located in Pool 5.

Pool 5 Recreation Areas							
River Mile	Name	Manager	State	Ramp	Camping	Toilets	Tables
752.8 R	Lock 4 Dike Walk-In	COE	MN	No	No	No	No
752.7 R	Pioneer Landing	MN	MN	Yes	No	No	No
751.6 L	Alma Landing	LG/WI	WI	Yes	No	Yes	No
749.8 R	Upper West Newton Landing	COE/MN	MN	Yes	No	Yes	No
748.0 L	Great River Harbor	PVT	WI	Yes	Yes	Yes	Yes
747.5 R	Halfmoon Landing	FWS	MN	Yes	No	Yes	Yes
747.3 R	Halfmoon Canoe Landing	FWS	MN	No	No	Yes	Yes
746.9 L	Belvidere Slough Landing	WI	WI	Yes	No	No	No
746.8 R	Goose Lake Landing	MN	MN	Yes	No	Yes	No
744.6 R	Weaver Landing	FWS	MN	Yes	No	Yes	No
744.3 L	Buffalo City Landing	LG	WI	Yes	No	No	No
742.4 L	Upper Spring Lake Landing	LG	WI	Yes	No	No	No
741.8 R	Minneiska Public Access	MN	MN	Yes	No	Yes	No
741.2 L	Lower Spring Lake Landing	FWS	WI	Yes	No	No	No

2.5 Natural Resources

2.5.1 PHYSICAL SETTING

Pool 5 is part of the Upper Mississippi River system. It was created in 1936 by the completion of L/D 5 and the filling of the pool. The entire pool is about 14.6 miles long, extending from river mile 738.2 to river mile 752.8. The target pool elevation is 660.0 ft above mean sea level.

The river valley varies in width from about one mile at L/D 4 to about 3.5 miles in the Weaver Bottoms area. The bluffs are steep on both sides and highly dissected, with a maximum relief of around 700-ft. The navigation channel parallels the Wisconsin shoreline at L/D 4 and Alma, and it parallels the Minnesota shoreline at West Newton Chute, Minneiska, and at L/D 5. The navigation channel otherwise follows a sinuous route through the center of Pool 5.

Sediment and Substrate. Sediment quality is generally good in Pool 5. Main channel sediments are primarily medium to coarse sands with only trace amounts (generally less than 3% by weight) of silts and clays. Sand, silt, and clay sediments are found within defined sloughs, while finer silt, clay, and organic substrate materials are found in marshy backwater areas.

Historic sediment test data going back to the 1970s in Pool 5 have shown that levels of pesticides and other chlorinated hydrocarbons are generally below detection limits in all main channel sediments and detected at low levels in backwaters. Since 2013, 18 samples have been collected throughout the main channel of Pool 5 at USACE dredge cuts. At all sites, samples were obtained using a 9-inch Ponar dredge, which represents approximately the top 10 centimeters of sediment. Each sample was collected from a single location or was a composite sample from two to three sub-samples. The sampling was accomplished by Corps' St. Paul District staff or through a sampling contract. Samples were immediately put on ice after collection and shipped overnight to ARDL, Inc., Mt. Vernon, IL for testing. Each sample was analyzed for metals, PCBs, pesticides, polycyclic aromatic hydrocarbons (PAHs) and grain size.

To characterize the sediment quality in Pool 5 dredge cuts, results of sediment samples collected since 2013 (Appendix B) were compared to the Minnesota Pollution Control Agency's (MPCA) soil reference values (SRVs) and sediment quality targets (SQTs). The MPCA's SRVs are limits on pollutant concentrations for material being placed at two types of upland sites, either recreational/residential or commercial/industrial. In 2016, the MPCA proposed updated values for SRVs. The proposed updated values are not yet finalized, but are being used for analysis in this report. The SQTs (level I and level II) are guidelines used to identify contaminant concentrations that cause harmful effects on sediment-dwelling organisms. Level I SQTs are the concentrations that will provide a high level of protection for benthic invertebrates. Level II SQTs are the concentrations that will provide a moderate level of protection for benthic invertebrates. As shown in Appendix B, there were no exceedances of MPCA's SRVs or SQTs in samples collected since 2013.

Hydrology. The drainage area of Pool 5 totals 58,845 square miles in Minnesota and Wisconsin. At project pool elevation of 660.0 ft (1912 adjustment), the pool has a total surface area of 12,580-acres. Except for several small creeks, the only major tributary that flows into Pool 5 is the Zumbro River, with a total drainage area of 1,380 square miles and typical summer discharge of 5,500 cubic ft per second (cfs). The Zumbro River enters the pool from the Minnesota side of the Mississippi River about three miles below L/D 4. Approximately two-thirds of the watershed is agricultural use; the rest is primarily forested lands and urban areas. Annual precipitation in the area is about 32 inches per year. The Whitewater River is a 16.6-mile-long tributary of the Mississippi River that enters the lower end of Pool 5 at Weaver Bottoms. Typical summer discharges are variable and dependent on precipitation but are generally around 250 cfs.

Pool 5 is approximately 14.6 river miles long with a surface area covering approximately 12,580-acres, 7,565-acres of which are Corps-owned. The U.S. Fish and Wildlife Service manages 7,192-acres, most of it Corps-owned land.

Early summer (June) discharges at L/D 5 generally range from 48,000 to 64,000 cfs. By late summer, discharges usually decrease to 18,000 to 32,000 cfs. Winter low flows are generally in the range of 13,000 to 22,000 cfs.

Pool 5 is regulated in a manner typical for navigation pools in the St. Paul District. When river discharges are greater than 116,000 cfs, the gates are removed from the water at L/D 5 and the pool is unregulated. When discharges are between 28,000 and 116,000 cfs, the pool is in “secondary control”; i.e., a pool elevation of 659.5 ft is maintained at the dam. The pool upstream of the dam rises and falls with river discharge. Due to the slope on the pool, the range of fluctuation under secondary control is greater the farther upstream from the dam one progresses.

At a discharge of 28,000 cfs, regulation of the pool shifts to “primary control” whereby a water surface elevation of 660.0 ft is maintained at the primary control point at river mile 749.4. As discharges decline below 28,000 cfs, the water surface elevation at L/D 5 rises from 659.5 toward 660.0. If river discharges were to decline to zero, the pool water surface would (in theory) be flat at elevation 660.0.

Weaver Bottoms. The Weaver Bottoms area is a 5,500-acre habitat complex within Pool 5 dominated by open water, but also includes flowing channels, backwater lakes, isolated wetlands, and forested islands.

Water Quality. This section of the river has relatively high water quality because Lake Pepin is a sink for sediment and contaminants from the Minnesota River and the Twin Cities Metropolitan Area. This section of the river does not appear on Minnesota’s impaired waters list, which identifies pollutants, stressors or indicators (such as turbidity, polychlorinated biphenyls (PCBs), fecal coliform) that would affect aquatic life and/or recreation. Except for isolated sloughs and backwater lakes, the dissolved oxygen content of the water remains above levels required to sustain a quality fishery. However, for phosphorus and mercury levels, Pool 5 of the Mississippi River is listed as an 303d impaired water in the state of Wisconsin with contaminated fish tissue impairment for mercury and PCBs.

2.5.2 BIOLOGICAL RESOURCES – AQUATIC HABITAT

Pool 5 has good, diverse habitat for both fish and wildlife. The most prevalent aquatic habitats include the main channel, channel border, and the river lakes. The important characteristics of these habitat types, relative to fish and wildlife uses are described below.

Main Channel. The main channel usually conveys the majority of the river discharge and in most reaches includes the navigation channel. It has a minimum depth of 9-ft and a minimum width of 300-ft. A current always exists, varying in velocity with water stages. The bottom type

is mostly a function of current. The upper pool section usually has a sand bottom, changing to silt over sand in the lower section. Patches of gravel are present in a few areas. No rooted vegetation is present.

Main Channel Borders. Main channel borders are the areas between the navigation channel and the riverbank. Channel borders contain the channel training structures (wing dams, closing dams, revetted banks) and thus a diversity of depths, substrates, and velocities can be found in this habitat type. The bottom is sandy in the upper section of the pool and siltier in the lower. Definable plant beds are frequently absent, but single species clusters of submersed plant vegetation are sparsely scattered in areas of reduced current.

Secondary Channels. Secondary channels are large channels that carry less flow than the main channel. Undercut or eroded banks are common where secondary channels depart from the main channel. The bottom type usually varies from sand in the upper reaches to silt in the lower. In areas with swifter current there is no root vegetation, but vegetation is common in the shallower areas having silty bottoms and moderate to slight current.

River Lakes and Ponds. River lakes are distinct lakes formed by fluvial processes or are artificial (excavated or impounded). They may or may not have a slight current, depending on their location. Most of the bottoms are mud or silt, often consisting of a layer two or more feet thick. Aquatic vegetation in these bodies of water can be highly variable. Emergent vegetation is generally restricted to the perimeter of these water bodies.

Fish. The continuum of aquatic habitats in Pool 5 ranges from fast flowing main channel to lentic backwaters which provides for a great diversity and abundance of fish. Common sport fish include walleye (*Sander vitreus*), sauger (*Sander canadensis*), yellow perch (*Perca flavescens*), white bass (*Morone chrysops*), bluegill (*Lepomis macrochirus*), black crappie (*Pomoxis nigromaculatus*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), northern pike (*Esox Lucius*), and channel catfish (*Ictalurus punctatus*). The most common rough fish include common carp (*Cyprinus carpio*), shorthead redhorse (*Moxostoma macrolepidotum*), spotted sucker (*Minytrema melanops*) and freshwater drum (*Aplodinotus grunniens*). The most common forage fish include gizzard shad (*Dorosoma cepedianum*) and spottail shiner (*Notropis hudsonius*).

Aquatic Invertebrates. There is a large assemblage of invertebrate species within the pool. The varied invertebrate fauna is due to the wide variety of habitats in the area. Lake forms of invertebrates find suitable habitat in the lentic portions of the pools. Organisms that require running water find a wide range of water velocities in the main channel, along the wing dams, and in side channels. Rocks associated with wing dams and shoreline protection provide a suitable habitat for specialized invertebrates.

Mussels. Zebra mussels first arrived in in Pool 5 in 1991 and after initial period of dramatic increases in the 1990's, densities have leveled and become more cyclic in nature with annual die offs followed by subsequent recruitment events. Historically, 35 native mussel species have occurred within Pool 5 with 30 species extant (Kelner 2018). According to the U.S. Fish and Wildlife Service (USFWS), the Higgins' eye pearl mussel (*Lampsilis higginsii*), spectacle case

(*Cumberlandia monodonta*), and sheepnose (*Plethobasus cyphus*) are Federally-listed endangered mussel species that may be present in Pool 5.

Insects. Burrowing mayflies are abundant along much of the Mississippi River. They are efficient detritivores and an important food organism for many species of fish. Two species listed for federal protection occur within the UMR Pool 5 vicinity, the rusty patched bumble bee (*Bombus affinis*) was listed as endangered on January 10, 2017 and the Karner blue butterfly (*Lycaeides melissa samuelis*) is listed as endangered.

Wildlife. The numerous backwaters interspersed with forested islands provide good habitat for a variety of wildlife species. Relatively abundant species include white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), river otters (*Lontra Canadensis*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), mink (*Neovision vision*), and cottontail rabbit (*Lepus sylvaticus*). Shrews, moles, bats, rabbits, and squirrels and numerous varieties of mice are common in the area. The Upper Mississippi River National Wildlife and Fish Refuge provides high quality wildlife habitat in this reach.

Backwater areas and lake-type habitats provide important habitats for bald eagles and significant numbers of waterfowl each year. They are important waterfowl breeding areas for the wood duck (*Aix sponsa*), blue-winged teal (*Anas discors*), mallard (*Anas platyrhynchos*), hooded merganser (*Lophodytes cucullatus*), and Canada goose (*Branta canadensis*).

The great variety of bird species that use the Pool 5 area can be attributed to its location within the Mississippi flyway. At least 300 species of birds, about 60% of the total number of species in the conterminous United States, are known to use the UMR. The UMR valley is a major bird migration corridor for the mid-continental United States through which an estimated 40% of the continent's waterfowl migrate. The Mississippi Flyway also provides migration habitat for songbirds, colonial nesting birds, secretive marsh birds, and raptors. Notable species include the bald eagle (*Haliaeetus leucocephalus*), red-shouldered hawks (*Buteo lineatus*), prothonotary warblers (*Protonotaria citrea*), black terns (*Chlidonias niger*), great blue heron (*Ardea Herodias*), egret (*Ardea alba*), osprey (*Pandion haliaetus*), double-crested cormorant (*Phalacrocorax auritus*), and pileated woodpecker (*Hylatomus pileatus*).

The floodplain of Pool 5 provides habitat for a wide variety of amphibians and reptiles. Species found in the floodplain and adjacent sand prairies include the snapping turtle (*Chelydra serpentina*), map turtle (*Graptemys geographica*), false map turtle (*Graptemys pseudogeographica*), Blanding's turtle (*Emydoidea blandingii*), painted turtle (*Chrysemys picta*), smooth softshell (*Apalone mutica*), spiny softshell (*Apalone spinifera*), northern water snake (*Nerodia sipedon*), eastern garter snake (*Thamnophis sirtalis*), bullsnake (*Pituophis catenifer sayi*), fox snake (*Pantherophis gloydi*), eastern tiger salamander (*Ambystoma tigrinum*), American toad (*Anaxyrus americanus*), gray tree frog (*Hyla versicolor*), western chorus frog (*Pseudacris triseriata*), green frog (*Rana clamitans*), and leopard frog (*Lithobates sp.*).

2.5.3 TERRESTRIAL HABITAT

Terrestrial habitats within the floodplain include areas of forest, brush and shrub areas, wet and upland meadows, areas disturbed by commercial, agricultural, and residential development and areas previously disturbed by past dredged material placement. Each of these areas can support a diversity of species and are important parts of the overall ecosystem.

The 900-acre Kellogg-Weaver Dunes Minnesota State Natural Area located in Wabasha County is a significant sand prairie grassland ecosystem. Also within the area is the 3,129 acre McCarthy Lake Wildlife Management Area. Many of the surrounding bluffs and valleys in Minnesota are part of the Richard J. Dorer Memorial State Forest, which covers 43,000 acres in Wabasha County.

2.5.4 WETLANDS

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas, and are frequently found within the floodplain of the Mississippi River. However, wetlands occur less frequently in the main channel and main channel border habitats because high flows, elevated suspended sediment concentrations, and deeper water often preclude vegetative growth.

2.5.5 THREATENED AND ENDANGERED SPECIES

Federally-Threatened and Endangered Species. Federally-listed endangered species are known to occur in Buffalo County, Wisconsin and in Wabasha and Winona Counties, Minnesota. The USFWS Information for Planning and Conservation (IPaC) website was used to identify Federally-listed threatened or endangered species known to occur in the study area (on-line search conducted February 8, 2019). They include the following freshwater mussels: the Higgins' eye pearl mussel, spectaclecase, and sheepsnose. Two insect species, the rusty patched bumble bee (*B. affinis*) was listed as endangered on January 10, 2017 and the Karner blue butterfly (*L. m. samuelis*) is listed as endangered. Two species, the northern long-eared bat (*Myotis septentrionalis*) and the eastern massasauga rattlesnake (*Sistrurus catenatus*) are Federally-listed as threatened. These species and their Federal listing status as of February 2019 are listed in Table 2.

Suitable habitat for the Higgins' eye pearl mussel includes areas of various stable substrates in large streams and rivers (USFWS 2004). Higgins' eye are most commonly associated with high-density and diverse mussel beds.

Suitable habitat for the sheepsnose is similar to that for the Higgins' eye (Ohio River Valley Ecosystem Team 2002). The spectaclecase is typically found in large rivers in a variety of substrates, but particularly within microhabitats sheltered from strong currents (Butler 2002).

As described by USFWS (IPaC February 2019): “Rusty patched bumble bees once occupied grasslands and tallgrass prairies of the Upper Midwest and Northeast, but most grasslands and prairies have been lost, degraded, or fragmented by conversion to other uses. Bumble bees need areas that provide nectar and pollen from flowers, nesting sites (underground and abandoned rodent cavities or clumps of grasses), and overwintering sites for hibernating queens (undisturbed soil).”

Suitable habitat for the northern long-eared bat is variable depending on the season and the life stage of the individual. In the summer, these bats often roost under the bark of tree species such as maples and ashes within diverse mixed-age and mixed-species tree stands, commonly close to wetlands. They are also known to occupy areas under bridges during the roost season. In the winter, the northern long-eared bat hibernates in caves and abandoned mines. During periods of migration and foraging, these bats tend to use the ‘edge habitat’ where a transition between two types of vegetation occurs (Wisconsin DNR 2013b).

The eastern massasauga rattlesnake is Federally-listed as threatened. It is typically found in open-canopy and forested wetlands, and adjacent uplands. They are particularly associated with emergent wetlands, shrub wetlands, and lowland hardwood habitats, and tend to avoid disturbed areas (Wisconsin DNR 2013a).

While the bald eagle (*Haliaeetus leucocephalus*) is no longer Federally-listed as Threatened or Endangered, it remains protected under the Bald and Golden Eagle Protection Act and is known to occur in Pool 5, especially during the winter. The open water area maintained at the confluence of the Chippewa River with the Mississippi River attracts large numbers of bald eagles during the winter.

Table 2. Federally Protected Species Identified in the Pool 5 Study Area.

Common Name	Scientific Name	Federal Status
Higgins Eye Pearly Mussel	<i>Lampsilis higginsii</i>	END
Sheepnose Mussel	<i>Plethobasus cyphus</i>	END
Spectaclecase Mussel	<i>Cumberlandia monodonta</i>	END
Rusty Patched Bumble Bee	<i>Bombus affinis</i>	END
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	THR
Eastern Massasauga Rattlesnake	<i>Sistrurus catenatus</i>	THR

(END = Endangered; THR = Threatened)

State-listed Rare Species. A number of species that are listed by the states of Minnesota and Wisconsin as endangered or threatened have been historically documented in the vicinity of Pool 5. These species include plants, freshwater mussels, fish, reptiles, and amphibians. To adequately evaluate effects to state listed species, a resource search of the Minnesota Natural Heritage Information System (MNHIS) was conducted January 2019 within a one mile radius of all of the potential alternative placement site locations. The entirety of Pool 5 was not evaluated because of the much greater number of state-recognized species of significance as compared to Federally-listed species and the site location being in Minnesota.

2.5.6 AIR QUALITY

The U.S. Environmental Protection Agency (USEPA) is required by the Clean Air Act to establish air quality standards that primarily protect human health. These National Ambient Air Quality Standards (NAAQS) regulate six major air contaminants across the United States. When an area meets criteria for each of the six contaminants, it is called an ‘attainment area’ for that contaminant; those areas that do not meet the criteria are called ‘nonattainment areas.’ Wabasha, Winona, and Buffalo Counties are classified as attainment areas for each of the six contaminants and therefore they are not regions of impaired ambient air quality (USEPA 2019). This designation means that the project area has relatively few air pollution sources of concern.

2.6 Cultural Resources

The upper Pool 5 locality contains numerous cultural resources indicating continual human occupation over approximately the last 13,000 years. Cultural resources include precontact burial mounds and habitation sites, and historic standing structures. These resources are situated across a variety of landforms, such as terraces, high bottoms, and dunes. Several cultural resource sites within this locality have been listed on the National Register of Historic Places (NRHP) or are eligible to be listed on the Register.

CHAPTER 3.

Historic Changes

This section summarizes changes to Pool 5 brought about by various navigation projects and other Federal activities. The purpose is to provide a background for the current conditions. It is not intended as a detailed description of all the changes that have occurred to the Mississippi River and its basin since European settlement.

3.1 Early Navigation Projects

The first navigation modifications and maintenance on the UMR were legislated by Congress in 1824, when the Corps was authorized to remove snags, shoals, and sandbars, and to close sloughs and backwaters so that flows were confined to the main channel to maintain depths for navigation.

The first comprehensive modification of the river for navigation was authorized by the Rivers and Harbors Act of 1878. This legislation authorized a 4.5-ft channel from the mouth of the Missouri River to St. Paul, Minnesota. The 4.5-ft channel was maintained by constructing dams at the headwaters of the Mississippi River to impound water for low flow supplementation, bank revetments, closing dams, and longitudinal dikes. The 6-ft navigation project was authorized by the River and Harbor Act of 1907. The additional depth for the 6-ft channel was obtained by increased construction of wing dams supplemented by limited dredging. Usually the banks opposite a wing dam field were protected with rock revetments to prevent erosion.

3.2 National Wildlife Refuge

The UMR National Wildlife and Fish Refuge was established in 1924 as a refuge for fish, wildlife, and plants and a breeding place for migratory birds. The Refuge encompasses one of the largest blocks of floodplain habitat in the lower 48 states, and stretches through four states along the Mississippi River: Minnesota, Wisconsin, Iowa, and Illinois. Bordered by steep wooded bluffs that rise 100 to 600-ft above the river valley, the Mississippi River corridor and refuge offer scenic beauty and productive fish and wildlife habitat unmatched in the heart of America. The Refuge covers just over 240,000-acres and extends 261 river miles from north to south at the confluence of the Chippewa River in Wisconsin to near Rock Island, Illinois.

3.3 9-Foot Navigation Channel Project

The Rivers and Harbors Act of 1930 authorized the 9-Foot Navigation Channel project and led to the construction of a series of locks and dams to provide the necessary water depths. Land that would be affected by the increased water levels in Pool 5 was purchased by the Corps. Much of that land is managed as part of the UMR National Wildlife and Fish Refuge under a cooperative agreement between the Corps and the USFWS.

The authorized navigation channel was created by both constructing the system of locks and dams and by dredging locations where water depths are less than 9-ft. In Pool 5, the navigation channel is typically dredged to a width of 300-ft (up to 600-ft in the bends or corners) and a depth of 12-ft in order to maintain adequate dimensions for commercial traffic between dredging events.

The effects of creation of the navigation pools have been described in many other studies. They can be synopsisized as follows. Creation of the navigation pools created thousands of acres of new aquatic habitat, benefiting those forms of fish and wildlife adapted to this habitat. Major beneficiaries were lentic fish species, waterfowl, marsh and other water birds, and small mammals. Adversely affected were terrestrial wildlife and lotic fish species. The period from creation of the locks and dams through the late 1950s could be termed an “era of plenty” due to the abundant fish and waterfowl resources generated by the newly created aquatic habitats.

As soon as the navigation pools were created, natural processes began to transform them. These transformations either were not noticed, or were not given much concern by the public. In the 1960s, resource managers and the public began to take more notice of these changes, most specifically the filling of backwater habitats with sediments. Sedimentation was probably the most significant resource concern in the 1960s and 1970s, and it remains an important concern.

3.4 Other Projects in Pool 5

Railroads. While railroads parallel both sides of the river, there are no railroad bridge crossings of the Mississippi River in Pool 5. On the Wisconsin side, a pair of Burlington Northern and Santa Fe railroad tracks lie riverward of State Hwy 35. On the Minnesota side, a pair of Canadian Pacific railroad tracks are set back from the river and generally follow along U.S. Hwy 61. Both rail lines were constructed prior to 1890 and have been operational to this day.

Construction of the Commercial and Recreational Harbors. Great River Harbor is a small marina and campground located near Belvedere Slough on the Wisconsin shoreline. There are no other commercial marinas in the study area.

Dairyland Power Cooperative. A barge mooring and unloading facility was constructed adjacent to the main channel in the late 1940s at the retired Alma Station power plant located just south of Alma, Wisconsin in Buffalo County near river mile 751. The John P. Madgett coal fired electrical power station was constructed on the site in the 1970s and continues to utilize the Alma Station barge mooring and unloading facility.

Weaver Bottoms. In the mid-1980s the Corps constructed two new islands (Swan and Mallard) and stabilized others in Weaver Bottoms under the Channel Maintenance program. The Corps has modified and maintained the islands since initial construction. The project resulted in improved floodplain habitat, redirected flows, reduced impacts of wind-generated wave action, and enhanced and protected vegetation. Trees were planted on the islands for future eagle nesting, sand areas were developed for turtle nesting, and mud flats were developed to promote vegetation growth for waterfowl and shorebird loafing and feeding areas. Backwater dredging was performed to increase connectivity and bathymetric diversity for fisheries.

CHAPTER 4.

Planning Considerations

4.1 Forecasting Future Conditions

Planning for the future requires projecting future conditions under various scenarios, including the No-Action scenario. Corps planning regulations (ER 1105-2-100) provide the following guidance concerning this subject. Future without plan conditions are the most probable based on:

- a) Existing Conditions and Trend Information.
- b) Available Related Forecasts (e.g. land use plans, population projections).
- c) Established Institutional Objectives and Constraints and Local Customs and Traditions (e.g. Authorized Projects, Refuge Master Plans, and Local Recreational Preferences).
- d) Reasonably Foreseeable Actions of People in the Absence of Any Proposed Action.
- e) Reasonably Foreseeable Natural Occurrences (e.g. Annual High Water, Natural Succession, and Climate Change).

The Corps regulation providing guidance for the conduct of Civil Works Planning Studies is ER 1105-2-100. Dredged material management plans are to be developed to meet dredging needs for a minimum of 20 years. The St. Paul District has opted to consider a planning horizon of 40 years of dredged material capacity in order to maximize the usefulness of the planning process.

4.1.1 EXISTING CONDITIONS

Dredged Material Management History in Pool 5. There are nine active dredge cuts in Pool 5 with recorded maintenance dredging since 1970. Between 1981 and 2018 nearly 4.0 million CY of material has been dredged from the Upper Zumbro, Mule Bend, West Newton, Below West Newton, Fisher Island, Lower Zumbro, Minneiska, Above Mt. Vernon Light, and Below Mt. Vernon Light dredge cuts (Table 3). Information on the nine dredge cuts in Pool 5 is summarized in the following table.

Table 3. Pool 5 Historic Dredging Totals: 1981-2018.

Pool 5 Dredge Cuts	River Mile	Dredging Total: 1981-2018	Avg. Per Year	Avg. Per Job	Freq. (%)	Projected Average Quantity for 40 years
Upper Zumbro	749.2-749.8	33,240	898	11,080	8%	35,920
Mule Bend	747.8-749.2	780,406	21,092	45,906	42%	843,680
West Newton	747.2-747.8	161,541	4,366	20,193	21%	174,640
Below West Newton	746.0-746.8	332,589	8,989	17,505	50%	359,560
Fisher Island	744.8-746.0	1,451,337	39,225	50,046	71%	1,569,000
Lower Zumbro	743.0-744.6	750,603	20,287	35,743	50%	811,480
Minneiska	742.7-743.0	280,156	7,572	28,016	26%	302,880
Above Mt. Vernon Light	741.2-741.5	157,988	4,270	22,570	16%	170,800
Below Mt. Vernon Light*	740.0-741.0	10,732	10,732	10,732	20%	429,280
Total		3,958,592	117,431			4,697,240

* Below Mt. Vernon Light dredge cut was established in 2018.

Note: All dredging totals and projected dredging averages were taken from St. Paul District Channels and Harbors project office.

Note: Numbers will be rounded for the remainder of the report.



Figure 2. Material Management Operations at West Newton Chute in Pool 5.

The various dredge cuts in Pool 5 need to be dredged on a frequent basis, generally once every one to three years. Dredging in Pool 5 has historically been done in a two-step process. Material from the routine dredging events is placed on temporary island placement sites adjacent to the dredge cuts. The island sites used in the past include Above West Newton, Fisher Island, and Lost Island. Placement at these sites is limited to the existing boundaries and elevations defined in the Channel Maintenance Management Plan (CMMP). When the islands reach their capacity, once every 10 to 50 years depending on the site, the material is moved to a permanent upland placement site. West Newton Chute is the only land-based site currently used for permanent placement of dredged material in Pool 5 (Figure 2). It is owned by the Corps and is available to the public for beneficial use removals. It will continue to be used for hydraulic and mechanical placement of material from dredge cuts and temporary island site unloading in Pool 5, as capacity allows.

The various conceptual paths dredged material can follow are displayed in Figure 3.

Dredging in Pool 5 generates approximately 117,000 CY of material each year (on average). The current practice for the Pool 5 dredge cuts upstream of RM 744.6 is to hydraulically dredge and place on a temporary island site. Cuts that are downstream of RM 744.6 (Lower Zumbro, Minneiska, Above Mt. Vernon Light, and Below Mt. Vernon Light) all get dredged mechanically, and the material is either barged directly to West Newton Chute or placed on Lost Island.

Temporary Placement Sites in Pool 5. The use of island temporary placement sites allows dredging operators to work quickly with minimal setup time, since the island sites are very close to the dredge cuts. This is particularly important at times when the navigation channel is blocked and time is critical because it is not a viable nor legal option to stop barge traffic within the UMR.

When capacity is reached at the temporary placement sites, they are excavated and material is transferred to upland placement sites. Hydraulic dredging equipment with long discharge lines and additional pumping plants have typically been used to unload up to 1.4 million CY at one time, although other methods have also been used efficiently. At least four different one-time upland placement sites in Pool 5 have accepted material from these island transfer sites over the years. In 2017-2018, approximately 1.5 million CY was offloaded from Lost Island mechanically, barged to West Newton Chute, and then placed onto the site hydraulically.

Temporarily storing the material on islands saves initial cost because the cost of moving the material to a final placement site is deferred to the future. However, managing dredged material in this manner is very costly long term due to “double-handling” of the material. Placing dredged material on an island site and later moving it to a permanent site (“double handling”) significantly increases the life-cycle cost of the operation. Additionally, many of these temporary island sites are permitted by WIDNR and MNDNR. Per the conditions of the permit, if island sites are no longer being used then material needs to be removed and the island needs to be restored to the appropriate condition. Thus relying on these sites as permanent storage sites would violate the conditions of the permit. Dredging operations must carefully balance cost with the need to keep the navigation channel open, using mechanical dredging as much as possible

and hydraulic dredging when necessary keeps project costs down since mechanical dredging is often times a more cost-effective method for routine dredging.

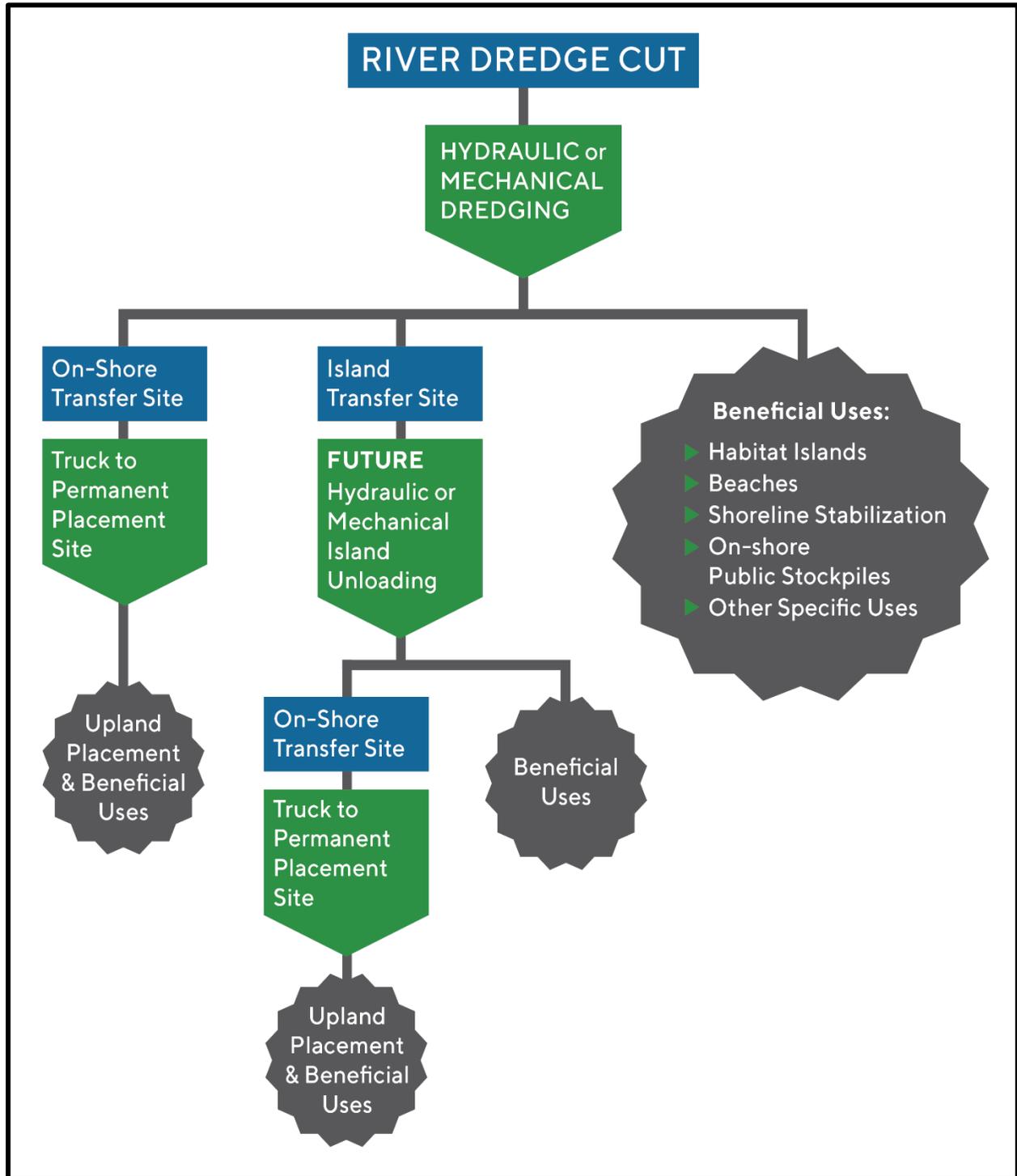


Figure 3. Conceptual Paths of Movement for Dredged Material.

On-Shore Transfer Sites. On-shore transfer sites are needed to remove dredged material from the river and put it onto trucks for hauling to a permanent placement site. Dredged material could arrive at on-shore transfer sites from either mechanical or hydraulic dredging from dredge cuts or the island transfer sites. West Newton Chute is the only active site in Pool 5 that could serve as an on-shore transfer site. On-shore transfer sites must be located near the dredge cuts and support a variety of activities, depending on the type of dredging:

- Unloading Barges
- Stockpiling Dredged Material
- Loading Dredged Material onto Trucks
- Containing and Dewatering Hydraulically Dredged Material

Permanent Placement Sites. West Newton Chute is the only active permanent upland placement site in Pool 5.

4.1.2 CLIMATE CHANGE

The Corps performed a qualitative climate change analysis in accordance with Engineering and Construction Bulletin, 2018-14 *Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Work Studies, Designs, and Projects* (USACE 2018). The full analysis is presented in Appendix D: Climate Change, and includes a literature review, a discussion of results from the USACE Watershed Climate Vulnerability Tool, and results from an analysis on the relevant components of river discharge that affect sediment transport.

The USACE Watershed Climate Vulnerability Tool indicates that the Upper Mississippi-Black-Root watershed is not highly vulnerable to the impacts of climate change on navigation projects relative to other HUC4 watersheds in CONUS. However, it is still vulnerable in an absolute sense. The climate change literature review concluded that an increased average annual precipitation in the region may lead to variation in the flow regime, which could affect dredging in the area. An increase in precipitation and annual discharge volumes would promote erosion and increased sediment transport, also affecting dredging activity and future planning for dredged material placement. Available literature suggests a warmer and wetter climate in the future. Observed increases in air temperature could impact durations of future frost-free seasons.

Relevant components of river discharge that affect sediment transport and engineering resilience include its magnitude, frequency, and duration. Average annual discharge and the number of days that discharge exceeds a bank full flood event were evaluated to explain the potential for increased sediment loading in Pool 5. This data is available for the Mississippi River at Winona, Minnesota, the Chippewa River at Durand, Wisconsin, and the Trempealeau River at Dodge, Wisconsin. The gauge located at Durand represents hydrologic conditions on the primary source of sediment to Pool 5. The gauge at Winona is located near River Mile 726 at the upstream end

of Pool 6, 13 miles downstream of Pool 5, and only separated by Pool 5A. It adequately represents flow conditions in Pool 5.

Observed trends in average annual discharge of the Mississippi River at Winona, MN were analyzed for statistical significance and concurred with findings in the literature review. Over the period of record (1928-2018), a statistically significant positive trend was identified in average annual discharge. An analysis was also done for the years 1941-2018 to exclude the dry years of the 1930s and 1940s, as well to account for regulation within the basin. A statistically significant positive trend line was observed for discharge for this time period as well. This positive trend line was also observed on the Chippewa River at the Durand gauge, as well as on the Trempealeau River gauge. Changing flow conditions will likely have effects on future dredging efforts in Pool 5, although the extent of those effects cannot be known with great accuracy.

Based on this assessment, the recommendation is to treat the potential effects of climate change and long-term natural variability in climate as occurring within the uncertainty range calculated for the current hydrologic analysis.

4.1.3 PROJECTED FUTURE CONDITIONS

The basis for projecting future dredging quantities in Pool 5 over the next 40 years is the dredging record from 1981-2018. Although there appears to be a long-term upward trend in discharge in Pool 5, recent dredging experience has not shown a similar trend in dredging volumes from 1981 to present. Assuming that dredging volumes remain consistent with recent history, it is estimated that 4.7 million CYs of dredged material will be generated over the 40-year period of analysis.

4.2 Problems and Opportunities

One of the critical steps performed early in the planning process is the identification of problems and opportunities associated within the geographic scope of the study area. Problem statements are concise characterizations of the broad issue that will be addressed with the project.

Opportunities can be directly related to solving the problem at hand, but can also be ancillary to the identified problem. From the list of problems and opportunities, objectives for the project are drafted. The success of the project planning is determined by the fulfillment of the objectives through identified alternative measures.

4.2.1 PROBLEMS

Sedimentation in the navigation channel is a continuing problem leading to the necessity for dredging and subsequent placement of the dredged material. The majority of sediments entering Pool 5 are those carried by the Chippewa River into Pool 4 and then moved downstream in the Mississippi River. Some of these sediments deposit within the designated navigation channel of Pool 5, reducing the available clearance for commercial vessels such as barges. Periodic

removal of this material (dredging) and placement of the material elsewhere is used to maintain the channel to dimensions suitable for commercial vessels.

There are few suitable locations on shore to support dredging operations. On-shore transfer sites and permanent placement sites are critical to maintaining the navigation channel.

4.2.2 OPPORTUNITIES

Opportunities exist for the potential use of dredged material for productive purposes, referred to as “beneficial use” of dredged material. The material from Pool 5 consists of medium to coarse sand and is suitable for a number of applications such as construction fill material, frac material, and winter road maintenance. Because it meets all applicable sediment quality criteria, it can be placed in the water for such purposes as island construction or other ecosystem restoration projects. The material is also highly suitable for beach nourishment and/or recreation.

Placement sites owned by the Corps can be made available to the public for utilization of the material. The St. Paul District has a number of dredged material placement sites where members of the public can remove material from the site for their use. This benefits the Corps because it creates additional capacity at placement sites.

4.3 Goals, Objectives, and Constraints

4.3.1 GOALS

Planning goals are broad, conceptual statements that describe the ultimate and over-arching purposes for the study. The overarching national goal of water resources planning is to contribute to national economic development while protecting the nation's environment. The Corps' mission includes maintaining a commercially navigable channel in the UMR. The goal of this study is to identify an acceptable method of managing the estimated 4.7 million CYs of material that will be dredged from Pool 5 during the 40-year planning period.

4.3.2 OBJECTIVES

Based on the project's problems and opportunities, specific objectives were established and are listed below. Many of these objectives are interrelated and will assist in meeting the over-arching goal. The guidance for developing objectives specifies that objectives must be clearly defined, must provide information on the effect desired, the subject of the objective, the location where the effect will occur and the timing and duration of the effect. For the purpose of this report, the timing or duration of the objectives is assumed to be the 40-year period of analysis. Clear objectives are used to identify measures and formulate alternatives that will achieve the project's goals.

The objectives for the proposed project are:

- Secure sufficient on-shore dredged material capacity for a minimum of 40-years of maintenance dredging.
- Secure river access to support the transfer of dredged material to permanent upland placement sites.
- Identify future properties within Pool 5 that could provide an additional dredged material capacity.
- Maximize beneficial use of dredged material for general public use, for gravel pit or mine reclamation and other specific upland uses, and for the construction or enhancement of authorized projects.
- Based on the GREAT I study recommendation, identify and give preference to properties that will be made available via a willing seller.

4.3.3 CONSTRAINTS

Planning constraints are temporary or permanent limits imposed on the scope of the planning process and the choice of solutions. These limits can be related to ecological, economic, engineering, legal and administrative aspects of a project. Some constraints are states of nature, whereas others are based on the design of built structures and other engineering considerations. Legislation and decision makers can impose other constraints; such human-imposed constraints are possible to change. The following planning constraints were established to guide and set boundaries on the formulation and evaluation of alternatives.

- ***Operational Feasibility.***

Placement sites must have dredged material capacity based on existing conditions and anticipated future conditions. Ideally, sites would be suitable for both hydraulic and mechanical dredging and placement methods.

Island sites cannot be used as permanent placement sites per conditions of the use permit signed with Minnesota and Wisconsin DNR.

The charge presented by the Corps Planning Guidance for Dredged Material Management Plans (ER 1105-2-100) is that plans should ensure material placement needs are met for a minimum of 20 years. In order to meet this criteria, the Corps will likely need to obtain a long-term real-estate interest (e.g. easement, ownership in-fee, etc.) in any property that will be planned for long-term use.

- ***Social Acceptability.***

Avoid or minimize, to the extent practicable, any sites that would have a negative impact on the surrounding community.

- ***Cultural Resources.***

Avoid or minimize, to the extent practicable, any impacts to cultural resource areas.

- ***Environmental Acceptability.***

Plan must avoid and minimize to the extent practicable any impacts to the 1 Percent Annual Exceedance Probability (“100-Year”) Flood Stage.

Avoid impacts to high value habitat and threatened and endangered species.

Avoid or minimize any impacts to wetlands.

CHAPTER 5.

Formulation of Alternatives and Plan Selection

This chapter details site identification, alternative development, comparison of alternatives, and plan selection. The Corps developed a list of potential dredged material placement sites based on publically available aerial imagery and property records. Consideration has been given to the full range of measures for dredged material management including: Federally-owned islands and shoreline placement sites, new sites, and potential future placement sites that could be made available for both mechanical and hydraulic placement.

5.1 No-Action Alternative

The No-Action Alternative for this DMMP represents no change in the current management plan. Under a normal feasibility study seeking authorization for a new project, the No-Action Alternative would mean that no action is to be taken. However, in the instance of an ongoing program, the No-Action Alternative refers to no change in program direction. According to Council on Environmental Quality (CEQ) guidance (1981):

“There are two distinct interpretations of “No Action” that must be considered, depending on the nature of the proposal being evaluated. The first situation might involve an action where ongoing programs initiated under existing legislation and regulations will continue, even as new plans are developed. In these cases “no action” is “no change” from current management direction or level of management intensity. To construct an alternative that is based on no management at all would be impractical. Therefore, the “no action” alternative may be thought of in terms of continuing with the present course of action until that action is changed.”

Accordingly, the No-Action Alternative represents continuing with dredging operations as it is currently being implemented. Truly taking “no action” in this case and, thereby, not maintaining the navigation channel in Pool 5 is not a viable or legal option and was not considered. However, the impacts of the No-Action Alternative still need to be considered and evaluated.

The No-Action Alternative considers what would happen in the absence of preparing and implementing a new plan for the management of dredged material in Pool 5 of the UMR. Under the No-Action Alternative, the 9-Foot Navigation Channel Project and congressional authorization for the Corps to maintain a commercial navigation channel in Pool 5 would remain in place. The No-Action Alternative does not imply that maintenance of the 9-Foot Navigation

Channel within Pool 5 would cease. However, there is uncertainty in how dredged material would be managed under this scenario, so several potential outcomes follow.

In the best case, no dredging would be required in order to maintain a functioning navigation channel in this stretch of river. This scenario has potential to occur for short periods of time (i.e., one dredging season at a minimum), but is extremely unlikely to persist based on the history of dredging requirements in this stretch of river. For instance, dredging has been conducted in Pool 5 to facilitate navigation traffic every year since 1981. The navigation channel is normally maintained to 12.0-ft deep and 300-ft wide (up to 600-ft wide in the bends and corners) to support commercial traffic.

Most dredging activity is conducted proactively to some degree. Channel conditions are monitored by the Corps to identify areas that are or will soon become problematic for navigation traffic. This allows the Corps to better prioritize efforts and most efficiently maintain the channel when equipment is mobilized in the area. Historically, material was dredged from the navigation channel and placed temporarily on island transfer sites adjacent to the dredge cuts. When island sites are nearly full, the Corps moves the dredged material to permanent placement sites to restore island capacity.

If acceptable dredged material placement sites in Pool 5 are not available or have limited capacity, the focus would likely shift towards dredging only when absolutely necessary to allow traffic to pass. The current plan for managing dredged material is the Channel Maintenance Management Plan (CMMP). The CMMP has identified the following order of priority for selecting placement sites for dredged material:

- (1) CMMP-Identified Permanent or Transfer Placement Sites.
- (2) CMMP-Identified Emergency Placement Sites.
- (3) Non-CMMP-Designated Placement Sites.

The following critical channel conditions are defined in the CMMP:

“Imminent Closure” is defined as a scenario when the actual water depth is projected by the District Engineer to be 10-ft or less within 14 days or less, or the channel width is less than 85% of the normally maintained width. Even though USACE has a 9-Foot Channel Navigation project, the Corps typically maintains a depth of at least 12-ft in most locations (some even greater than 12-ft), but typical dredging operations begin where there is 10.5-ft or less water depths project within 14 days.

“Emergency Dredging” is defined as dredging required to free a grounded vessel or remove shoals (submerged bars) in the channel as a result of a vessel freeing itself. The emergency will continue only until an adequate channel depth and width, as determined by the Corps of Engineers, is restored to allow vessel passage. Once these conditions are reached, the Corps would need to dredge the channel, regardless of placement site availability. Under this scenario, dredged material may need to be placed at non-designated placement sites where environmental review has not been completed. These may include in-water or shoreline placement sites, or other practicable alternatives as identified. (For example, in 2014 the Corps found it necessary

to place dredged material directly into the river during a channel closure at the Grand Encampment dredge cuts in Pool 4. Other placement sites were not readily available, and the navigation channel was closed. The material was temporarily placed in the river and removed later in 2014). Any material that is placed in water, under the no-action alternative, would need to be removed to another site as soon as practicable.

Under the No-Action Alternative, the Corps would work to secure short-term solutions, but in the long-term, it would be likely that the need would arise to utilize areas for placement without adequate time to fully evaluate the consequences of site use or search for other viable alternatives. This may lead to greater environmental or social impacts.

With the current available capacity of 1,300,000 CY at Lost Island, 740,000 CY available at Above West Newton, 380,000 CY available at Fisher Island, and the approximate 1,700,000 CY additional capacity available at West Newton Chute (if maximum height of dredged material placement to an elevation 720'), the No-Action Alternative has the ability to provide at least 25 years of dredged material placement. However, it is neither efficient nor cost effective (i.e. transporting and "double-handling" of dredged material) to fill the three island sites to capacity without having permanent placement sites secured for the material. Island sites are often used to place material from routine and emergency dredging operations, so maintaining placement capacity at these sites is critical to maintaining the 9-foot navigation channel. Additionally, all identified island sites are permitted by WIDNR and MNDNR as temporary transfer sites, which are defined as interim holding locations until the site is filled and the material can be economically removed and transferred to designated permanent sites. Per the conditions of the permit, if island sites are no longer being used then material needs to be removed and the island needs to be restored to the appropriate condition. Thus relying on these sites as permanent storage sites would violate the conditions of the permit. Finding suitable placement sites near the river is optimal for placement due to the reduced transportation costs; however, land availability near the river is seldom available so when there is an opportunity to pursue land that is for sale it is necessary for the Corps to explore the acquisition of the property.

In summary, under the No Action alternative, currently approved and available placement sites in Pool 5 would not be expected to accommodate material placement needs for the next 40 years. If approved CMMP sites are not available when dredging is required in Pool 5 due to navigation emergency situations, dredged material may need to be placed at non-CMMP designated placement sites. Non-designated placement sites can include temporarily placing dredged material in the aquatic main channel border areas (in-water placement). The use of non-designated placement sites may result in higher costs and greater environmental or social impacts. Presumably though, these instances would be short-term, and a new planning effort would occur to identify the most acceptable dredged material management methods for the pool.

5.2 Planning Process

Planning in Pool 5 began with an evaluation of the current dredging practices and expected future capacity needs, as described above. Next, a range of alternatives were developed to identify opportunities for beneficial use and locate suitable lands to support dredging operations

and long-term placement of dredged material. The Corps coordinated with Federal and State natural resource agencies as well as local governments early in the process to solicit input and ideas. Later in the process, the Corps issued press releases to notify landowners that USACE was seeking to buy land from willing sellers. The Corps sent letters to landowners in the areas of interest and asked them to contact USACE if they were willing to sell their land.

5.3 Pool 5 Habitat Restoration through the Use of Dredged Material

Dredged material has periodically been used for habitat improvement on the Upper Mississippi River. Locally, dredged material has been used to create islands (e.g., Spring Lake Island, Swan Island and Mallard Island in Pool 5), as well as raise floodplain elevations to create topographic diversity and conditions favorable for floodplain forest (L/D 4 Embankment). Indirect benefits also occur as other construction materials, such as fine material used to cap dredged sand, can be obtained from the river. This benefits aquatic backwater habitats via increased water depth. Beneficial use of dredged material for habitat purposes can be performed if the project costs are generally similar to other methods for permanent placement of dredged material. This presents a unique opportunity to benefit river habitat without use of traditional funds for river restoration.

The potential to improve habitat in Pool 5 by the use of dredged material is always being considered; however, this is a partial solution to managing dredged material within the project area and a more comprehensive long term solution is needed. Currently, dredged material is available at numerous beneficial use facilities up and down the river if there is an immediate need to use material to build and improve habitat. In cooperation with agency partners, Wisconsin and Minnesota Departments of Natural Resources as well as the USFWS Refuge offices, the use of dredged material to rebuild and improve habitat within the Pool 5 project area could be a possibility in the future. Funding from the Upper Mississippi River Habitat Rehabilitation and Enhancement Program (HREP) or via a cost share agreement through the Corps' Continuing Authorities Program (CAP) for feasibility planning and construction are funding options to use material for habitat restoration if cooperating agencies agree to such a project.

5.4 On-Shore Transfer Sites

Table 4 lists existing river access points in Pool 5 that were considered as potential on-shore transfer sites for dredging operations. Typical dredging operations in Pool 5 is either done by a mechanical or hydraulic dredge. Sites that are capable of handling material via a mechanical dredge is based on the capacity to manage the material on site, access to the site from the river, and how the operations are compatible with the surrounding area. Sites capable of handling dredged material hydraulically are sites that are in close proximity to the river, sites that have an existing containment berm or have room to construct a containment berm (containment berms are typically 10' tall and 15' wide at the base), and sites that are capable of handling return water after the material is dredged. Upper West Newton Landing was evaluated for access to potential placement sites in Minnesota. The Martin Access and Belvidere Slough sites were considered

for access to potential placement sites in Wisconsin near Buffalo City. The remaining sites were not pursued after initial consideration due to implementability (i.e. ability to carry out the action without restriction) concerns, land use and aesthetic concerns, capacity limitations, and adverse effects to natural resources, public safety, and recreation.

Only Upper West Newton Landing was carried forward for further evaluation at this time. The site is an existing Federally-owned river access point adjacent to the West Newton Chute.

Table 4. Pool 5 Access Points Considered for On-shore Transfer Sites.

Access Point	Location (River Mile &	Current Land Use	Comments/Status
Pioneer Landing	752.7 R	Public Access	Not on main stem of river. Recreation only. Not suitable for dredging ops.
Alma Landing	751.6 L	Public Access	Located at local power plant. Possible mechanical access--not suitable for hydraulic. Used for recreational access.
Upper West Newton Landing	749.9 R	Public Access & Dredging	Federally-owned existing USACE access point. Suitable for offloading barges and supporting hydraulic and mechanical dredging operations. Adjacent to existing West Newton Chute placement site. MNDNR boat landing supports recreational access when dredging is not occurring.
Great River Harbor	748.0 L	Public Access	Commercial campground. Significant recreational use. Access dredging would be required. Tight access. Not likely useful to us.
Halfmoon Landing	747.5 R	Public Access	Not on main stem. Shallow recreation access only.
Martin Access	746.9 L	Public Access/Privatey Owned Property	Property was vacant until a house was built in 2017. Site is privately owned and no longer considered suitable as an on-shore transfer site.
Belvidere Slough Landing	746.9 L	Public Access	Possible access. Would need coordination with state of Wisconsin. Access dredging needed. Could support either hydraulic or mechanical ops. Best existing access for placement sites north of Buffalo City. If sites in Wisconsin are needed in the future, this site could be reevaluated for use.
Goose Lake Landing	746.8 R	Public Access	Not on main stem. Shallow recreation access only.
Weaver Bottoms Landing	744.6 R	Public Access	Not on main stem of river. Recreation only. Not suitable for dredging ops. No room for staging or material stockpiles.
Buffalo City Landing	744.3 L	Public Access	Residential area. Recreation only. No room for staging or material stockpiles.
Upper Spring Lake Landing	742.4 L	Public Access	Unimproved access. Recreation only. Near to residential properties. No room for staging or material stockpiles.
Minneiska Public Landing	741.8 R	Public Access	Tunnel under Hwy 61 blocks access for barges. Not suitable for ops.
Lower Spring Lake Landing	741.2 L	Public Access	Would need significant access dredging to get barges there.
Dairyland Power Cooperative Power Plant Site	751.4 L	Private	Corps considered acquiring and/or utilizing capacity within this site. Site was eliminated due to restrictions placed on filling the site due to the testing of dredged material.

5.5 Permanent Upland Placement Sites

The Corps considered the following to determine the most suitable sites for dredged material placement:

- The life-cycle cost to use each site, including real estate acquisition, site development and hauling cost from the identified on-shore transfer sites.
- Operational considerations and site capacity, including proximity to the dredge cuts and potential to use the site for hydraulic dredging, as well as proximity to potential on-shore transfer sites for mechanical dredging, and highways for hauling and beneficial use.
- The environmental acceptability of each site using established criteria, including endangered species present, water quality, wetland impacts, flood stage impacts and other natural resources as appropriate.
- The social acceptability of each site was also considered when determining which site(s) should be included in the Recommended Plan. It was important to prioritize sites that wouldn't negatively impact the community. Site comparisons were made by looking at the disturbance caused by hauling, handling, and placement of dredged material.

Estimated Site Capacities. The capacities of potential placement sites were estimated so that sites could be compared for screening and site selection. Capacity estimates were based on the useable acreage and assumptions about the average depth of placement at each site. In general, an average of 15-ft placement depth was assumed, based on a maximum depth of 20-ft with 10% side slopes and 2% top slope to allow drainage without causing erosion. No setback distances were taken into account for the quantity calculations presented in this report. Actual setbacks will vary based on local codes and coordination will take place prior to the placement of dredged material. The intent was to blend in with adjacent elevations to minimize visual impacts to the landscape as much as practicable. No detailed site layout was developed as part of the screening and site selection in this DMMP. The actual placement depth will be determined during implementation of the management plan.

Costs. A parametric cost estimate was prepared for acquiring and using the recommended plan site. The same basic assumptions were applied to each site, and the estimates were intended only for purposes of making comparisons. The cost/CY includes the physical handling of the dredged material by means of hydraulically or mechanically dredging the material out of the river, barging the material to a transfer site, unloading the material from the barge, temporary stockpiling, trucking the material, if required, and placing the material in its final placement site. The estimate also includes indirect costs such as real estate and development costs for the placement sites.

Trucking. The cost of trucking is primarily a function of the travel distance and the number of trucks needed to achieve an efficient production rate. With a constant production rate for each alternative, travel distance is the main factor. Therefore, the greater distance the placement site

is from the transfer site, the higher the trucking cost. The potential impacts of trucking dredged material within the project area can be found in section 7.1 below.

Dredging. The cost of dredging varies depending on the type of dredging operations used, i.e. mechanical or hydraulic methods, mobilization and demobilization of equipment, distance the material will travel to a temporary or permanent placement site, and the convenience of access from the dredge cut to onshore placement sites.

Placement. This cost includes the work of a dozer to spread the dredged material after it is dumped by a truck.

Acquisition. Acquisition costs include costs for real estate needed to place material on the site.

Development. Development costs includes access improvements, site clearing, stripping and re-spreading topsoil, erosion control and screening.

5.6 Alternative Development

5.6.1 IDENTIFICATION OF PLACEMENT SITES

The Corps assessed current local land uses and contacted land owners to develop a list of sites potentially suitable for permanent placement of dredged material. Once identified, sites were evaluated based on aspects of environmental acceptability, operational feasibility and estimated costs. Several potential permanent placement sites were evaluated throughout Pool 5. Areas considered were south of the Zumbro River (near Kellogg, Minnesota) and east of Hwy 61 on the Minnesota side of the Mississippi River. On the Wisconsin side, parcels were identified in the area north of Buffalo City and south of Cochrane along River Road Drive. Three island transfer sites and one inland placement site, all owned by the Corps, were also evaluated.

5.6.2 EVALUATION AND COMPARISON OF ALTERNATIVES

The permanent placement sites that were evaluated for feasibility were assessed based on their ability to meet the planning objectives and long-term material capacity needs. In addition, sites were evaluated to determine whether selection would be cost effective, environmentally acceptable, and operationally feasible among other pertinent considerations (Table 5).

In regards to long-term material capacity, sites were evaluated for their capacity to hold dredged material. Multiple sites could be used if no single site had sufficient capacity for 40 years. In addition, potential areas were compared to determine whether or not access to an onshore transfer site or direct hydraulic placement was available. The capacity of each location was also determined. The goal was to identify a set of sites that could accept 4.7 million CY of dredged material in the next 40 years at the least cost. The criteria used to judge environmental acceptability included consideration of natural resources, wetlands present, flood stage impacts, contamination of the site, and other considerations under Section 404(b)(1) of the Clean Water

Act. With regards to operational function, general implementability of the site and whether material placement in the area would constitute a beneficial use or if sites would be available for public beneficial use of the material were considered. Cost was used in determining whether or not a site was cost effective versus other sites considered as part of the long-term plan.

Based on the GREAT I Study recommendations, social acceptability was considered in determining which site(s) should be included in the Recommended Plan. It was important to prioritize sites that wouldn't negatively impact the community. Site comparisons were made by looking at the disturbance caused by hauling, handling, and placement of dredged material. One goal was to avoid sites near a community or a residential area where hauling operations could affect people. Seeking out willing sellers within the project area was an important component of social acceptability. The GREAT I Study recommendations highlight the importance of working with willing sellers and condemning land only when necessary. As such, public notices and letters seeking willing sellers were distributed throughout the community to determine if suitable land was available to the Corps for purchase.

Future use sites for dredged material management were also identified and were confined to three general areas within Pool 5. These selected areas were southeast of Kellogg, Minnesota, south of Cochrane, Wisconsin, and north of Buffalo City, Wisconsin. Currently these sites, identified in orange on the Wisconsin side in Figure 4, were screened out due to social impacts, unavailability of onshore transfer sites, inconvenient access to placement sites, and cost as compared to our Recommended Plan. Future use sites were also screened out on the Minnesota side due to social impacts and cost. When there is a need for future capacity, property within these areas will likely be further evaluated for use as a placement site. Additionally, any site that would be potentially used as a future placement site would need to have a full NEPA assessment and fulfill all USACE real estate requirements prior to being acquired and incorporated into this dredged material management plan.

The comparison and status of all of the potential permanent placement sites are listed in Table 5. The Rolling Prairie site was selected as the recommended permanent placement site for dredged material. The difference in cost between using each one of the potential permanent placement sites was primarily a function of trucking costs. Due to the Rolling Prairie site meeting the objectives and evaluation criteria (i.e. cost, operational feasibility, and environmental acceptability) it was selected as part of the Recommended Plan. In addition to selecting the Rolling Prairie Site as part of the Recommended Plan, West Newton Chute (currently the only Corps owned onshore transfer/permanent placement site in Pool 5) was also selected as part of the plan. The three Corps owned islands in Pool 5 (Above West Newton, Above Fisher Island, and Lost Island) would also be retained as part of the Recommended Plan. The combination of the sites selected meet the planning objectives for the Pool 5 DMMP.

Table 5. List of Pool 5 Alternative Placement Site Screening Summary and Status.

Placement Site	Estimated Maximum Capacity (KCY)	Current Land Use	Summary of Screening	Current Status
West Newton Chute	3,200	USACE Owned Transfer and Beneficial Use Site	<p>Operationally Feasible: Onshore placement site capable of accepting dredged material placed hydraulically and mechanically. Site is approved to have material placed to the elevation of 720’.</p> <p>Environmentally Acceptable: Site has gone through the NEPA approval process. Contains no wetland acreages.</p> <p>40-Year Capacity: Site can be used as a temporary placement site or transfer site.</p> <p>Socially Acceptable: Site is already Federally-owned and deemed acceptable.</p> <p>Cost Effective: Site is an existing Federally-owned site.</p>	Retained due to site meeting objectives and screening criteria.
P Sites: 1A, 1B, 2B, 3, 4	9,000	Agriculture	<p>Operationally Feasible: These sites are well-suited for both mechanical and hydraulic placement of dredged material from Pool 5 due to their proximity to river access through the West Newton Chute landing area</p> <p>Environmentally Acceptable: Sites contain approximately 100 acres (22%) of wetland signatures.</p> <p>40-Year Capacity: Capable of handling 40 years of capacity.</p> <p>Socially Acceptable: Not socially acceptable due to land acquisition issues.</p> <p>Cost Effective: Close to transfer site and short haul distance (Avg. 1.3 miles) makes this site cost effective. Average costs are approximately \$27.79/CY.</p>	Eliminated sites due to environmental and social acceptability.
L1	7,500	Agriculture	<p>Operationally Feasible: Site is well-suited for mechanical placement of dredged material from the West Newton Chute landing area.</p> <p>Environmentally Acceptable: Site contains approximately 50 acres (14%) of wetland signatures.</p> <p>40-Year Capacity: Site is capable of handling 40 years of Pool 5 dredged material</p> <p>Socially Acceptable: Not socially acceptable due to land acquisition issues.</p> <p>Cost Effective: A verage hauling distance from West Newton Chute to this site is 2.0 miles. Average costs are approximately \$28.16/CY.</p>	Eliminated site due to socially acceptability issues.
B1	4,700	Agriculture	<p>Operationally Feasible: Site is well-suited for mechanical placement of dredged material from the West Newton Chute landing area.</p> <p>Environmentally Acceptable: Site contains approximately 130 acres (39%) of wetland signatures.</p> <p>40-Year Capacity: Site is not capable of handling 40 years of dredged material.</p> <p>Socially Acceptable: Not socially acceptable due to land acquisition issues.</p> <p>Cost Effective: A verage hauling distance from West Newton Chute to this site is 2.5 miles. Average costs are \$28.80/CY</p>	Eliminated sites due to environmental and social acceptability.

Placement Site	Est. Max Capacity (KCY)	Current Land Use	Summary of Screening	Current Status
Rolling Prairie Site	18,500	Agriculture	<p>Operationally Feasible: Site is well-suited for placement of dredged material. Its close proximity to West Newton Chute makes it practical as a permanent placement site for Pool 5 material. The site can be used via the County Road 84 trucking route to transfer dredged material to the property.</p> <p>Environmentally Acceptable: Site contains approximately 160 acres (16%) of wetland signatures.</p> <p>40-Year Capacity: Site is capable of handling more than 40 years of dredged material.</p> <p>Socially Acceptable: Site will be acquired via willing seller.</p> <p>Cost Effective: Haul distance from West Newton Chute to this site ranges from 1.5 to 2.5 miles. Average costs are \$28.66.</p>	Retained site because it meets all objectives and screening criteria.
Sites Near Kellogg, MN	N/A	Agriculture	<p>Operationally Feasible: Proximity to the West Newton Chute site makes sites in this area practical as permanent placement sites for material placed at West Newton Chute. Material could be trucked to various sites but they have been deemed less advantageous than other options at this time.</p> <p>Environmentally Acceptable: It is anticipated that many of the sites would contain significant wetland signatures.</p> <p>40-Year Capacity: Many sites were not capable of handling 40 years of capacity.</p> <p>Socially Acceptable: Not socially acceptable due to land acquisition issues.</p> <p>Cost Effective: Not cost effective due to the extra haul distance to these sites.</p>	Eliminated sites due to not meeting objectives and screening criteria.
Sites Near Buffalo City, WI	N/A	Agriculture	<p>Operationally Feasible: Lack of onshore transfer sites, difficulty accessing this area for hydraulic offloads.</p> <p>Environmentally Acceptable: It is anticipated that many of the sites would contain significant wetland signatures.</p> <p>40-Year Capacity: Many sites were not capable of handling 40 years of capacity.</p> <p>Socially Acceptable: Social impacts of placing and trucking material close to the community. Not socially acceptable due to land acquisition issues.</p> <p>Cost Effective: Not cost effective due to the extra haul distance to these sites.</p>	Eliminated sites due to not meeting objectives and screening criteria.
Sites Near Cochrane, WI	N/A	Agriculture	<p>Operationally Feasible: Lack of onshore transfer sites, difficulty accessing this area for hydraulic offloads.</p> <p>Environmentally Acceptable: It is anticipated that many of the sites would contain significant wetland signatures.</p> <p>40-Year Capacity: Many sites were not capable of handling 40 years of capacity.</p> <p>Socially Acceptable: Social impacts of placing and trucking material close to the community. Not socially acceptable due to land acquisition issues.</p> <p>Cost Effective: Not cost effective due to the extra haul distance to these sites.</p>	Eliminated sites due to not meeting objectives and screening criteria.

Note: The cost/CY includes the physical handling of the dredged material by means of hydraulically or mechanically dredging the material out of the river, barging the material to a transfer site, unloading the material from the barge, temporary stockpiling, trucking the material, if required, and placing the material in its final placement site.

Note: All **Eliminated** sites will not be included as part of the Recommended Plan but will be retained for potential future use opportunities.

CHAPTER 6.

Detailed Description of Recommended Plan

The Recommended Plan represents sites that have plenty of capacity, contain minimal social impacts, are operationally feasible and are an environmentally-acceptable method of managing the estimated 4.7 million CY of material that would be dredged from Pool 5 during the 40 year period of the DMMP. The need for a large permanent placement site is due to the favorable circumstances that would accompany land acquisition (i.e land would be acquired via willing sellers). The components of the Recommended Plan consist of permanent placement sites, transfer sites, temporary island placement site, and future use sites (Figure 4).

The minimum interest deemed necessary for the project has been determined to be fee. All lands associated with the project will be acquired in Fee-Simple Absolute title. However, if the minimum interest cannot be acquired, the District Chief of Real Estate may propose to deviate from the required minimum interest and/or standard estate. A formal request to HQUSACE to deviate from established policy and/or standard estate language would be required. When a policy deviation or Non-Standard Estate has been proposed for a project, HQUSACE approval will be secured before landowner negotiations resume.

Components of the plan are:

- 1) **Permanent Placement Site:** One upland placement site where dredged material would be permanently placed after it is transferred from a temporary site via trucks.
- 2) **Transfer Site:** One land-based placement and transfer site with river access where dredged material would be temporarily placed for transfer to adjacent permanent placement sites.
- 3) **Temporary Island Placement Sites:** Three island placement sites that have been historically used by the Corps.
- 4) **Evaluated Future Use Sites:** Three selected areas have been identified for potential dredged material placement sites in the future.

1. *Permanent Placement Site*

<i>Permanent Upland Placement Sites</i>	<i>Maximum Capacity</i>	<i>Cost/CY</i>	<i>Placement</i>
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Rolling Prairie Site	18,500,000 CY	\$28.66	Haul to Site via Truck
Total	18,500,000 CY		

The permanent placement site was selected as part of the Recommended Plan because the site has enough material capacity, minimizes social impacts, is operationally and environmentally feasible, is cost effective, and can be purchased via willing sellers, which will meet the objectives of the Pool 5 DMMP. The site allows for permanent placement of approximately 18.5 million CY of dredged material that will be hauled from the West Newton Chute onshore transfer site. The \$28.66 per CY is the average total cost from dredge cut to final placement. The total costs includes dredge cuts, handling of the material, barging, and trucking the material from transfer sites, real estate acquisition, site preparation, and placing the material on the final Rolling Prairie permanent placement site.

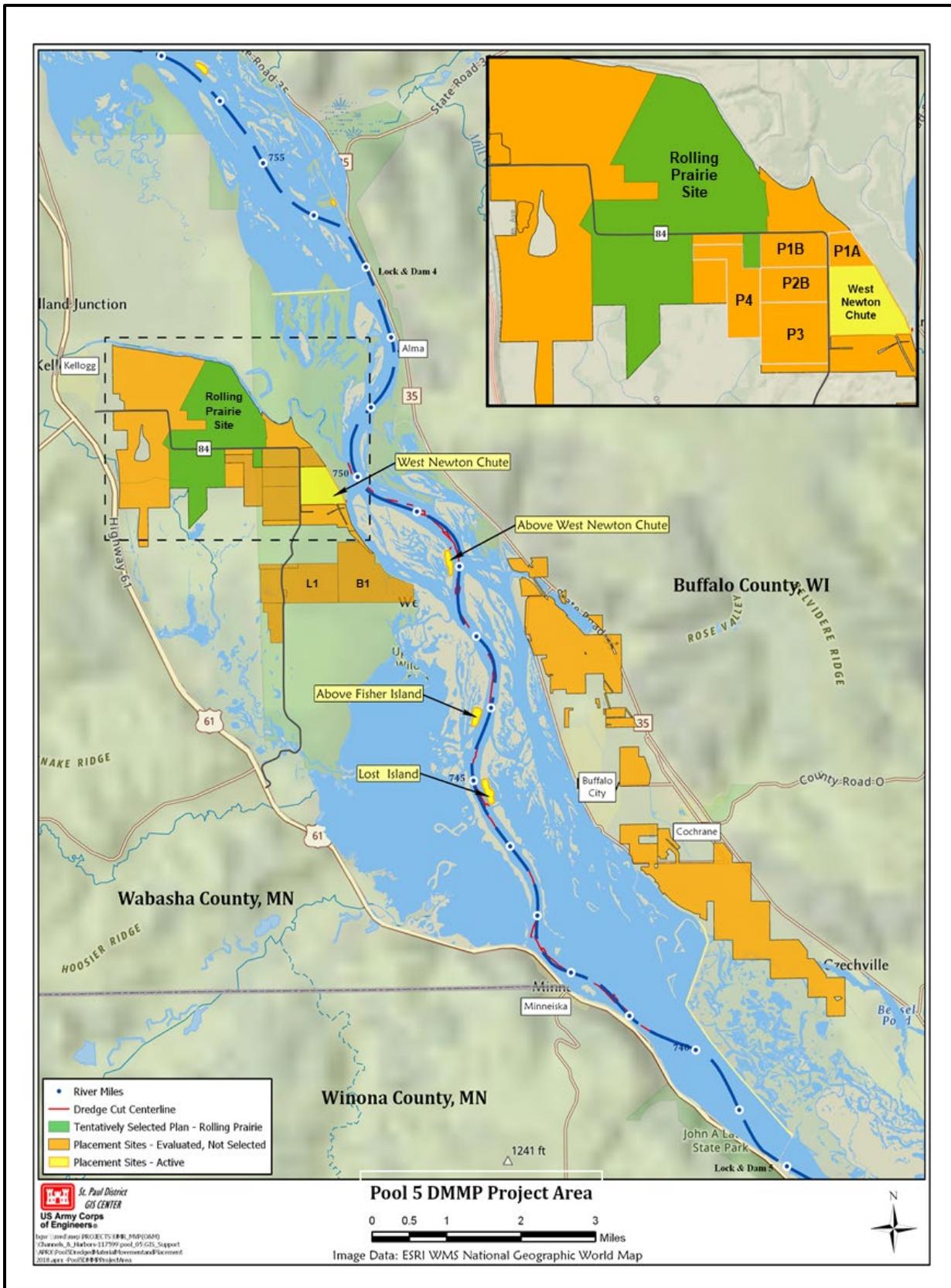


Figure 4. Map of Active, Evaluated, and Recommended Sites Located in Pool 5.

2. *Temporary Upland Placement and Transfer Site*

West Newton Chute is the only Federally-owned temporary land-based placement and transfer site with river access that was selected for the Recommended Plan. It allows for placement of material directly from the dredge cuts where material can be hauled away over time. While the maximum permanent capacity is listed, the site is currently very active and recently received dredged material from the Lost Island offload. Capacity will vary as material is placed and removed in the future. The current available capacity, after the completion of the Lost Island offload, is approximately 500,000 CY. Additionally, while the site is capable of having material stacked to the elevation of 720' (i.e. estimated at 3,200,000 CY), its desired operational capacity is approximately 2,000,000 CY. Its value in the plan is to provide river access to adjacent permanent placement sites, allow for temporary placement of material dredged mechanically, eliminate the current practice of conducting periodic offloads from island placement sites, provide opportunities for public beneficial use, and to provide for some additional storage contingency in the plan.

<i>Temporary Upland Placement Site</i>	<i>Desired Maximum Capacity</i>	<i>Placement</i>
West Newton Chute	2,000,000 CY	Hyd., Mech.
Total	2,000,000 CY	

3. *Temporary Island Placement and Transfer Sites*

Above West Newton, Above Fisher Island, and Lost Island are the three Federally-owned island placement sites that have been used historically by the Corps are retained in the plan for contingency operational flexibility purposes. The islands would be utilized for mechanical or hydraulic placement only if the land-based placement/transfer sites identified in the Recommended Plan become unavailable, are at capacity, if it's operationally more feasible to use the island sites or would need to be used during emergencies in the future. The maximum capacities listed are those for the pre-filled condition.

<i>Island Placement Sites</i>	<i>Maximum Capacity</i>	<i>Placement</i>
Above West Newton	1,300,000 CY	Hyd., Mech.
Above Fisher Island	1,000,000 CY	Hyd., Mech.
Lost Island	1,300,000 CY	Hyd., Mech.
Total	3,600,000 CY	

Estimated costs for island placement are similar to land-based placement costs, but temporary island placement requires an additional deferred expense for hydraulic offloads to land-based sites when capacity is reached. Island offloads occur approximately every 10-years or as needed.

4. *Evaluated Future Use Sites*

Potential future sites for Pool 5 dredged material management have been identified in both Minnesota and Wisconsin. When needed, the Corps has identified areas that have sites that will be acquired to fulfill the long-term dredged material placement sites.

<i>Future Upland Placement Sites</i>	<i>Capacity</i>	<i>Placement</i>
Southeast of Kellogg, Minnesota	Unknown	Hyd., Mech.
North of Buffalo City, Wisconsin	Unknown	Hyd., Mech.
South of Cochrane, Wisconsin	Unknown	Hyd., Mech.

6.1 **Rolling Prairie Site**

The Rolling Prairie Site is an upland placement site located in Section 26, T110N, R10W in Wabasha County, Minnesota. This placement site is located approximately 1.5 miles west of West Newton Chute along the north and south sides of County Road 84. The site is a multi-parcel mixed agricultural and upland placement site located on a sandy terrace of the Mississippi River Valley. Capacity at this site provides more than 40 years capacity (approximately 18,500,000 CY) of dredged material placement. To satisfy the requirements of the plan, the Corps is working towards the acquisition of up to 962 acres from willing sellers. The final acquired acreage may vary as determined by the willing sellers. Landowners within the Pool 5 project area approached USACE about acquiring their property. These landowners are only interested in selling their property in a one-time payment. Parsing out the land and buying it in piecemeal was not an option at this site.

Of the approximately 962 acres, approximately 830 acres can be used for permanent placement of dredged material to avoid filling of wetlands of the acquired property. The site has been used for agricultural purposes on the northern and southern portions with most of the wetlands located on the very southern portion. The use of the site would convert up to 830 acres of row crop agricultural land use to a dredged material placement site use over the life of the project. Within the acquired sites it is anticipated that smaller sub areas (40-80 acre) will be filled incrementally until desired capacity is reached. If land is not being used for placement, it will remain in the same state that the land is currently in (i.e agricultural row crop and wetland). The entire 990 acre site is located north and south of County Road 84 (Figure 5).

Ownership. Private

Size and Capacity.

Site Area:	962 acres
Est. Unit Cost:	\$28.66 per CY
Maximum Capacity:	18,500,000 CY
Remaining Capacity:	18,500,000 CY
Beneficial Use Removal:	Yes

Operation and Beneficial Use. Dredged material placed at the Rolling Prairie Site will be made available to the public for beneficial use as needed. A portion of the site will be deemed a “beneficial use area” where material is made available to the public. Access, site preparation, and proper signage will be required.

Pool 5 dredged material typically consists of clean sand, which is a useful commodity for general construction fill, winter road maintenance, landscaping, and other applications. Dredged material will be placed hydraulically and/or mechanically on the West Newton Chute placement site. Material will then be loaded onto trucks and trucked to its permanent Rolling Prairie placement site. Therefore, placement at the Rolling Prairie site would be exclusively done by mechanical means.

Cost. The unit cost per CY of dredged material placement ranges from \$26.00 per CY for material coming from the Upper Zumbro River sites to \$32.02 for material coming from the Lower Zumbro site. The Cost/CY includes the physical handling of the dredged material by means of mechanically or hydraulically dredging the material out of the river, barging the material to a transfer site, unloading the material from the barge, temporary stockpiling, trucking material, if required, acquiring real estate, preparing the site, and placing the material in its final placement site.

Site Preparation. The site could be accessed from County Road 84 for beneficial use removal. Material placed in areas that would impede water drainage patterns will be graded and new culverts added to facilitate run off and avoid pooling. Existing culverts will not be blocked and will remain functional. Placement of material near the levee bordering the Zumbro River along the northeast portion of the site will be set back sufficiently so that the levee can be maintained and existing drainage patterns are not disturbed. Dredged material designated for the Rolling Prairie site will be placed on the property in such a manner that it will not cause drainage issues on any adjacent properties. Material would be shaped to provide some topographic relief mimicking the nearby Weaver Dunes area similar to how the Corps has managed the West Newton Chute site. Over time as the maximum elevation for placement is reached at the site, the dredged material (minus the material within the beneficial use area) will be covered with topsoil and planted with native prairie grasses.

Site Layout and Usage. It is anticipated that the location identified for initial placement of dredged material at the Rolling Prairie site would be within the northern portions of the parcels located immediately south of and abutting County Road 84. While we intend to start placing material initially on an approximately 75 acre parcel south of County Road 84, the intent is to evaluate the long-term placement of dredged material on entire 962 acres. It is anticipated the 75 acre parcel will be filled to capacity before other parcels are used; however, other areas within the Rolling Prairie site may need to be considered for initial placement of material. It is anticipated that over the life of the plan most of the upland area identified at Rolling Prairie will be used for dredged material placement. Remaining acreage not designated for initial placement will remain in its current state (i.e agricultural row crop, wetlands, etc.) until it is needed for placement. The unused agricultural row crop land will be available to lease until it is needed for

dredged material placement. If a new site is identified for the placement of dredged material, the following actions will take place, to the extent practicable, before using:

1. Prioritize sites that were previously used as agricultural row crops.
2. Avoid sites with significant tree cover.
3. Avoid wetlands if upland areas are present. If no upland acreages are available, wetland mitigation sequencing will take place prior to placement.
4. Avoid sites that would negatively impact cultural resources. Prior to placement, USACE will follow the guidelines set-forth by the Pool 5 DMMP Programmatic Agreement (see Appendix F).

Transportation. The use of the new Rolling Prairie placement site will require trucking a substantial amount of dredged material approximately 1.5-2.5 miles from West Newton Chute via County Road 84 to the site. Given the close proximity of the sites, trucking could occur year round to include during winter months. During trucking operations, it is estimated that 200 or more additional heavy truck round trips per day could occur on County Road 84 over an extended period of time. The described trucking activities would likely occur once every 5 to 10 years on average, over a duration of several weeks or months, with large scale island offloads determining the schedule. Small scale hauling efforts could occur on an annual basis. These trucking operations are subject to operational flexibility by the Corps of Engineers, and will be briefed in advance via public notice to the general public and local government leadership.

Implementability. No railroad crossing or highway improvements would be needed to allow for safe beneficial use access. If access is needed within a different section of the property then the appropriate roads, culverts, and necessary improvements would be made. There are no HTRW concerns on this site.

Access Improvements. Minimal improvements such as signage and shoulder work would be necessary to open the site for public removal of dredged material. A small access road and culvert would likely need to be added just off of County Road 84. Beneficial use removal from the site can occur via County Road 84. If improvements are needed on the property then the appropriate roads, culverts, and necessary improvements would be made.

Natural Resources. Wetlands and wooded areas are present on the very southern portion of the Rolling Prairie Site but are largely absent in the majority of the site. Wetland areas would be avoided as part of the permanent placement of dredged material within the 830 acre area of proposed use. However, if avoiding wetlands later becomes impracticable due to capacity needs, the District will prepare a Section 404(b)(1) evaluation before the wetland is filled. The District would mitigate for any unavoidable wetland impacts according to current policy at that time. Material placed in areas that would impede water drainage patterns will be graded and new culverts added to facilitate run off and avoid pooling. Existing culverts will not be blocked and will remain functional.

Socioeconomics. Use of this site for the placement of dredged material would result in a land use change from agricultural production to a permanent dredged material management site. To the extent practical, the District plans to offer leases that would allow farming operations to occur on areas of the Rolling Prairie placement site until such time that they are needed for

dredged material placement. The site would be made available for public beneficial use of the material if needed.

Cultural Resources. While there is a high probability for portions of the site to have historic properties, there are none known at this time as the area has not yet been surveyed. However, a Programmatic Agreement has been developed to ensure potential concerns and to ensure compliance with the National Historic Preservation Act. Furthermore, within the 962 acres identified, historic sites could be avoided while still ensuring sufficient area is available for dredged material placement to meet the project need.

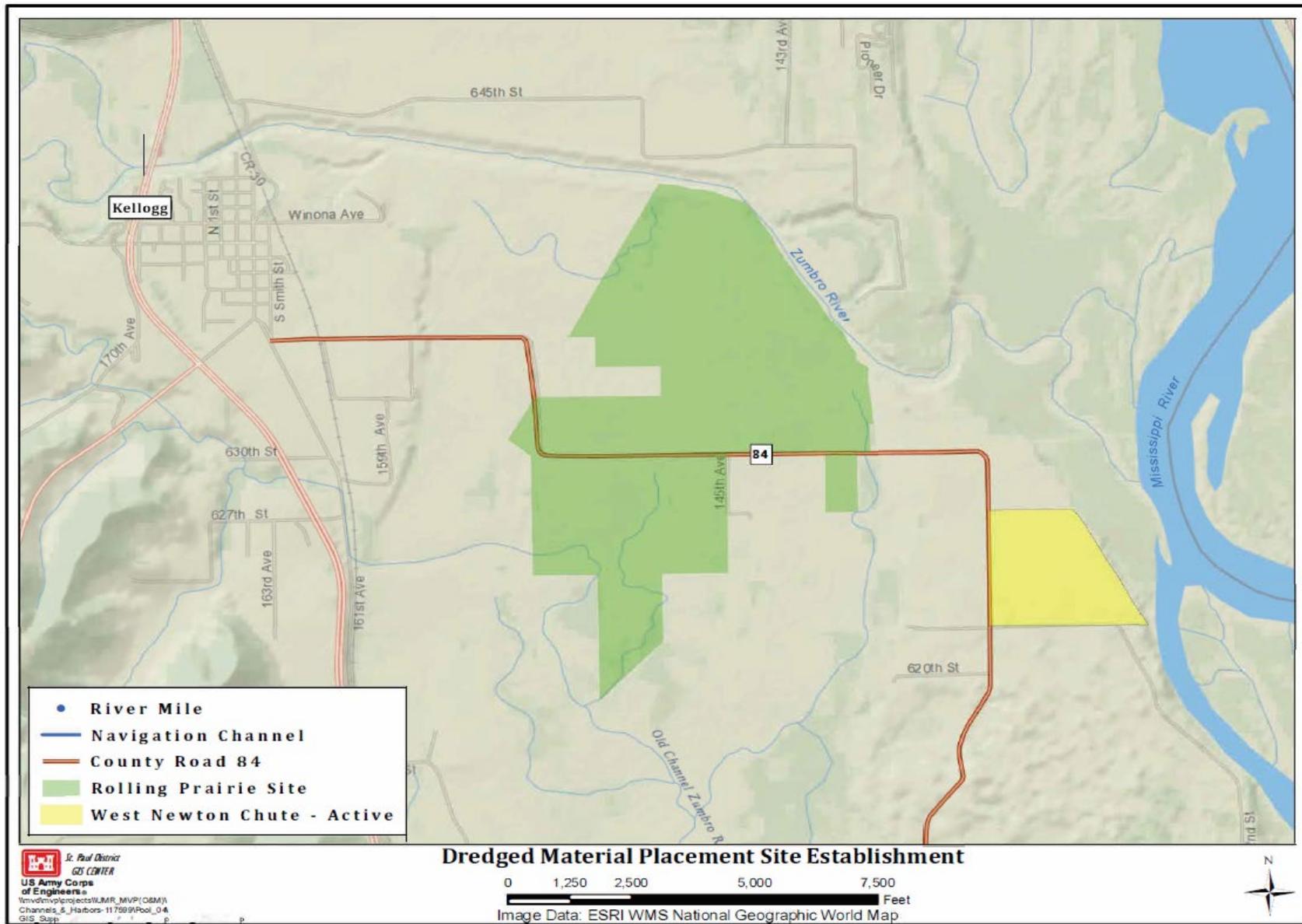


Figure 5. Recommended Plan for Long-Term Placement Site for Dredged Material in Pool 5.

6.2 West Newton Chute

West Newton Chute is an upland placement and transfer site located in Section 31, T110N, R9W, Wabasha County, Minnesota (Figure 5) as identified in the District's CMMP. The site is a former agricultural field and an active dredged material placement site owned by the Corps.

General Description. West Newton Chute is an existing USACE placement site capable of accepting dredged material placed hydraulically and mechanically. The site has a desired operational capacity of approximately 2,000,000 CY; however, material can be stacked to the elevation of 720' (i.e. 3,200,000 CY). It provides mechanical and hydraulic access with return water management through USFWS property.

Ownership. USACE

Size and Capacity.	Site Area:	158 Acres
	Maximum Fill Elevation:	720.0 feet
	Remaining Capacity:	1,700,000 CY
	Maximum Capacity:	3,200,000 CY
	Beneficial Use Removal:	Yes

Operation and Beneficial Use. West Newton Chute is a permanent placement site for the storage of dredged material unloaded from the 3 temporary island placement sites in Pool 5, most recently hydraulically offload of Lost Island. Currently, the material is available for beneficial use. The West Newton Chute landing area provides access from the main channel to the Rolling Prairie Site for mechanical placements from the dredge cuts in Pool 5. The southeastern corner of the site abuts the Mississippi River which allows for immediately access to the river. The landing area also provides a land-based mechanical placement option for transfer to the Rolling Prairie Site for permanent placement. When the landing area is used for dredging operations, the Corps coordinates with the MNDNR, which manages and maintains the Upper West Newton Landing boat landing. The West Newton Chute site would still continue to provide an important on-land placement option and transfer site to other nearby permanent placement sites even after it is filled to capacity for permanent placement. Under the proposed Recommended Plan, dredged material will be placed at West Newton Chute and trucked approximately 1.5 miles to the Rolling Prairie permanent placement site. The trucks will use the rural County Road 84 route. This portion of County Road 84 is not heavily travelled and trucks will only travel past three rural residences that are located 500 to 1,500 ft from the route.

Natural Resources. West Newton Chute is an active dredged material placement site. Adjacent land use is mostly agricultural with some residential properties along the river. There appears to be no wetlands, historic properties, or HTRW concerns at this site.

Socioeconomics. Continued use of the site would not change existing land use or be expected to result in adverse impacts to the surrounding area. Material placed at the site would be available for beneficial use by the public.

Site Layout and Preparation. The site is accessible from County Road 84. No site preparation is required since it is an active placement site that is at or near capacity. Alternative site layouts may be used.

Access Improvements. No access improvements are required.

6.3 Island Temporary Placement Sites

The three Federally-owned island placement sites (Above West Newton, Above Fisher Island, and Lost Island) identified in the Recommended Plan have been used historically by the Corps and are retained for contingency purposes. They will be utilized if the land-based temporary, transfer, or placement sites become unavailable, are at capacity or if it's operationally more feasible to use the island sites or would need to be used during emergencies in the future. Additionally, dredge cuts downstream of RM744 would be placed on Lost Island or barged straight to West Newton Chute. The island placement sites provide no beneficial use option. Hydraulic and mechanical placement methods that have been conducted in the past would be used in the future only if the sites are needed.

6.3.1 ABOVE WEST NEWTON

General Description. The island is an existing temporary management and transfer site located in the floodplain and floodway of the Mississippi River and is identified as such in the District's CMMP. There is no land access to this site. Dredged material has been placed on the site in the past and containment berms have been constructed. Rock groins were constructed in 1990 to reduce shoreline erosion.

Ownership. USACE

Size and Capacity.

Site Area:	14 Acres
Maximum Fill Elevation:	696.0 ft
Maximum Capacity:	1,300,000 CY
Remaining Capacity:	740,000 CY
Beneficial Use Removal:	No

Operational Feasibility. This is a temporary placement site suitable for both mechanical and hydraulic placement of material from Pool 5. Past practice has been to use the site for direct hydraulic and mechanical placement from nearby dredge cuts until capacity is reached and it is practical to move. Island offloads occur approximately every 10 years; however, the current capacity is about 740,000 CY.

Natural Resources. The site is bound by bottomland forest and the main navigation channel. There is no vegetation located within the diked containment and material placement site. There are no known Federally-listed T&E species within the placement and containment areas of the site.

Socioeconomics. There is no access to the site by road which prevents beneficial use, but offloaded material has been used beneficially for landfill. Use of the site requires a future offload step that increases dredged material management costs over the 40 year period of the DMMP.

6.3.2 Above Fisher Island

General Description. The island is an existing temporary management and transfer site located in the floodplain and floodway of the Mississippi River and is identified as such in the District's CMMP. There is no land access to this site. Dredged material has been placed on the site in the past and containment berms have been constructed. Rock groins were constructed in 1990 to reduce shoreline erosion.

Ownership. USACE

Size and Capacity.	Site Area:	14 Acres
	Maximum Fill Elevation:	700.0 ft
	Maximum Capacity:	1,000,000 CY
	Remaining Capacity:	380,000 CY
	Beneficial Use Removal:	No

Operational Feasibility. This is a temporary placement site suitable for both mechanical and hydraulic and mechanical placement of material from Pool 5. Past practice has been to use the site for direct hydraulic placement from nearby dredge cuts until capacity is reached and it is practical to move. Island offloads occur approximately every 10 years; however, the current capacity is about 380,000 CY.

Natural Resources. The site is bound by bottomland forest and the main navigation channel. There is no vegetation located within the diked containment and material placement site. There are no known Federally-listed T&E species within the placement and containment areas of the site.

Socioeconomics. There is no access to the site by road which prevents beneficial use, but material from the site has been used beneficially for island construction in Weaver Bottoms. Use of the site requires a future offload step that increases dredged material management costs over the 40 year period of the DMMP. The containment site is also used beneficially for recreation.

6.3.3 LOST ISLAND

General Description. The island is an existing temporary management and transfer site located in the floodplain and floodway of the Mississippi River as is identified as such in the District's

CMMP. There is no land access to this site. Dredged material has been placed on the site in the past.

Ownership. USACE

Size and Capacity.

Site Area:	18 Acres
Maximum Fill Elevation:	700.0 ft
Maximum Capacity:	1,300,000 CY
Remaining Capacity:	1,300,000 CY
Beneficial Use Removal:	No

Operational Feasibility. This is a temporary placement site suitable for both mechanical and hydraulic placement of material from Pool 5. Past practice has been to use the site for direct hydraulic and mechanical placement from nearby dredge cuts until capacity is reached and it is practical to move. Island offloads occur approximately every 10 years; however, it will have nearly full available capacity after the 2019 island offload.

Natural Resources. The site is bound by bottomland forest and the main navigation channel. There is no vegetation located within the disturbed area of the placement site. There are no known Federally-listed T&E species within the placement and containment areas of the site.

Socioeconomics. There is no access to the site by road which prevents beneficial use, but material from the site has been used beneficially for island construction in Weaver Bottoms. Use of the site requires a future offload step that increases dredged material management costs over the 40 year period of the DMMP. The containment site is also used beneficially for recreation.

6.4 Selection of Potential Future Use Sites.

Potential future sites for Pool 5 dredged material management have been identified in both Minnesota and Wisconsin indicated by their orange coloring (Figure 4). These areas were identified from aerial imagery and are large parcels of land that could be used for placement of dredged material. If these additional permanent dredged material placement sites are needed in the future, the following steps will be taken to acquire the property.

1. Identify potential sites that are adequate enough to handle dredged material placement capacity needed at the time.
2. Seek out property from willing sellers, if possible, in the Pool 5 area.
3. Conduct a full environmental review – NEPA, Wetland Delineation, and evaluate sites for any potential contamination.
4. Fulfill all USACE real estate requirements.
5. Choose least-cost, operationally feasible, environmentally acceptable property for the long-term placement of dredged material.
6. If additional sites are needed in the future, appropriate USACE policy and guidance will be followed.

CHAPTER 7.

Evaluation of Environmental Effects

This environmental analysis has been conducted to address compliance with the National Environmental Policy Act (NEPA). This document is tiered off of the Final Environmental Impact Statement for the 9-Foot Navigation Channel Project CMMP EIS published June 6, 1997¹. The tiering off of EIS documents for environmental assessments is appropriate as described in CEQ guidelines 40 CFR 1502.20 and 1508.28.

The Pool 5 DMMP was initiated in 2014 when uncertainty of the future availability of dredged material placement sites in the area and rising dredging costs prompted an effort to identify the best strategy for long-term management of dredged material within the pool. A detailed analysis of potential placement sites, documented in this report, identifies the Recommended Plan as a product of 1) cost effectiveness, 2) close proximity to the river for operational feasibility, and 3) relatively low environmental and social impacts. The Recommended Plan consists of using the existing approved West Newton Chute beneficial use and permanent dredged material placement site as a transfer site prior to hauling the material to the newly selected Rolling Prairie site, also to be used for beneficial use and permanent placement. The Recommended Plan also retains three island placement sites used for temporary placement of dredged material for contingency purposes. The active beneficial use and permanent and temporary sites (Chapter 1; Figure 1) in the Recommended Plan considered and reviewed within previous NEPA documentation include:

- *Beneficial use and permanent placement (West Newton Chute); Temporary placement (Above West Newton; Fisher Island, and Lost Island): Final Environmental Impact Statement, 9-foot Navigation Channel Project, Channel Maintenance Management Plan, Upper Mississippi River, Head of Navigation to Guttenberg, Iowa. St. Paul District, USACE. (June 1997).*
- *West Newton Chute expansion (beneficial use and permanent placement): Environmental Assessment. Dredged Material Management: Lost Island Offload – West Newton Chute Placement. St. Paul District, USACE. (June 2016).*

This analysis has been prepared to assess the environmental consequences of the No-Action Alternative and the Recommended Plan. The discussion below focuses on the environmental effects of impacts associated with transferring dredged material from the West Newton Chute beneficial use and permanent placement site to the newly acquired Rolling Prairie site. To satisfy the requirements of the plan, the Corps is working towards the acquisition of up to 962

¹ As of February 2016, the CMMPEIS is available at:

<http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA328184>

acres from willing sellers which will satisfy the desired 40 years of dredged material placement capacity need. To minimize environmental effects, specific areas within the approximately 962 acres available for, beneficial use and permanent placement of dredged material will be limited as practicable to approximately 830 acres of agricultural upland sites with no wetlands and limited tree cover. However, if avoiding wetlands becomes impracticable due to capacity needs, the District would at that time follow all wetland mitigation sequencing procedures (avoid, minimize, compensate) and prepare a Section 404(b)(1) evaluation needed. To ensure cultural resource are adequately considered, prior to placement USACE will follow the guidelines set forth by the Pool 5 DMMP Programmatic Agreement (see Appendix F) to address potential impacts to cultural resources.

Within the project area, it is anticipated that smaller sub areas (40-80 acre) will be filled incrementally until desired capacity is reached. If land is not being used for placement, it will remain in the same state that the land is currently in (i.e. agricultural row crop and wetland). Upon filling sub areas to capacity, the dredged material will be covered with topsoil and planted with native prairie grasses. The location identified for initial placement of dredged material at the Rolling Prairie site is approximately 75 acres and lies in the northern portion of the parcels located immediately south of and abutting County Road 84. It is anticipated this area will be filled to capacity before other parcels are used; however, other areas within the Rolling Prairie site may need to be considered for initial placement of material as needed. Over the life of the plan most of the 830 acres of upland area identified at Rolling Prairie will be used for dredged material placement. Environmental effects of placing dredged material apply throughout the entire Rolling Prairie placement site under the constraints identified (i.e. upland agricultural land lacking wetlands). If over the course of the project it is determined that the impacts of placing dredged material differ from what is described here, those affects will be reevaluated and additional environmental compliance documentation will be prepared and coordinated as required.

This environmental assessment evaluates the impacts associated with acquiring the approximately 962 acres from willing sellers for the purpose of placing dredged material over the course of the next 40 years. This assessment does not focus on environmental effects to existing sites (i.e. Lost Island, Above Fisher Island, Above West Newton, and West Newton Chute) as they already have completed NEPA documentation. Other sites identified but not selected as part of the Recommended Plan would be need to undergo environmental compliance review, likely including an environmental assessment, prior to their use for dredged material placement. Those sites are identified in Figure 4 and in Section 7.5. The Recommended Plan provides adequate capacity for anticipated dredged material placement for the next 40 years.

The No-Action Alternative, discussed in Section 5.1 of this report, serves as the base condition against which the Recommended Plan is compared for evaluating effects. Existing sites that have already been addressed through previous NEPA documentation are assumed to be part of the No-Action Alternative. The effects of the Recommended Plan are the results of the expected differences in conditions short-term and into the future between the No-Action and the Recommended Plan. The environmental effects of both alternatives are summarized in Table 6.

The effects evaluated under both alternatives are specific to the action of material placement, and do not incorporate the effects of the main channel dredging itself. The effects of the channel dredging were evaluated in the 1997 CMMP EIS. No substantial changes to the Corps' channel dredging operations have occurred since 1997 that are relevant to this assessment. In addition, there are no significant new circumstances or information related to the environmental effects of channel dredging. This evaluation is based on acquiring up to 962 acres, of which up to 830 acres that are available for material placement, to provide an additional 40 year period of channel maintenance and dredged material placement. The environmental effects in this evaluation should apply throughout the entire site under the constraints for placement identified. Environmental effects are expected to be less if the entire 962 acres of land identified in the Recommended Plan is not acquired.

Table 6. Environmental Assessment Matrix.

No Action Alternative				Symbol: X = Long-Term Effects				Recommended Plan						
BENEFICIAL		ADVERSE		PARAMETER				BENEFICIAL		ADVERSE				
SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT	X = Long Term Effects ST = Short Term Effects ? = Not Enough Info. Available	SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT
A. Social Effects														
				X			Noise Levels					X		
				X			Aesthetic Values					X		
			X				Recreational Opportunities					X		
				?			Transportation					X		
			X				Public Health and Safety				X			
			X				Community Cohesion (Sense of Unity)				X			
			X				Community Growth and Development				X			
			X				Business and Home Relocations				X			
			X				Existing/Potential Land Use						X	
			X				Controversy					X		
B. Economic Effects														
			X				Property Values				X			
			X				Tax Revenue					X		
			X				Public Facilities and Services				X			
			X				Regional Growth				X			
			X				Employment				X			
			X				Business Activity				X			
			X	?			Farmland/Food Supply						X	
				?			Commercial Navigation		X					
				?			Flooding Effects				X			
			X				Energy Needs and Resources				X			
C. Natural Resource Effects														
				X			Air Quality					X		
				?			Terrestrial Habitat		X			ST		
				?			Wetlands				X			
				?			Aquatic Habitat				X			
			X				Habitat Diversity and Interspersion				X			
				X			Biological Productivity		X			ST		
				?			Surface Water Quality				X			
			X				Water Supply				X			
			X				Groundwater				X			
			X				Soils				X			
			X				Threatened and Endangered Species				X			
D. Cultural Resource Effects														
			X				Historic Architectural Values				X			
			X				Prehistoric & Historic Archeological Values				X			

7.1 Socioeconomic Effects

Commercial Navigation. The No-Action Alternative could have adverse effects on commercial navigation that are unknown. Overall, the navigation channel would still be maintained and closures would be unlikely but the inefficiencies of maintaining the channel would result in higher overall costs. However, deteriorated channel conditions (narrower or shallower than would typically be maintained) may result from the just-in-time dredging that would be likely when it is difficult to find material placement locations. The no-action alternative would likely cause an increase in costs incurred by the Federal Government in operating and maintaining the channel in Pool 5 but remains unknown as to the extent. In instances where placement sites are not available when dredging is required, temporary placement sites are sought, which often leads to double-handling the dredged material. Double-handling can nearly double the expense of managing the material. Future unknown costs may be incurred for use of placement sites not owned by the Federal Government. Restoration of additional temporary placement sites may also be necessary, further increasing future unknown costs.

The use of the Rolling Prairie placement site under the Recommended Plan would have minor beneficial effects on commercial navigation by providing sufficient dredged material placement capacity to maintain the navigation channel and ensure reliable navigation.

Noise and Aesthetics. The No-Action Alternative would continue to have a recurring minor adverse impact on noise and aesthetics as dredging and near-by material placement would continue as identified in the 1997 CMMP EIS. The magnitude of the effects is unknown because currently-approved CMMP placement sites will provide dredged material capacity for nearly 40 years; however, using these sites only is extremely costly and the need for a cheaper long-term plan is needed. Noise impacts from dredged material placement typically include noise created by machinery used to place and manipulate the material at the placement site, which could include dozers, loaders, and trucks. Trucks would also be expected at the West Newton Chute beneficial use placement site which offers material free for public use. The impact of this noise is related to what noise receptors are present in the placement area. Aesthetic effects typical of dredged material placement are changes in the way a site looks compared to its present state. Following placement of dredged material, sites usually maintain a sandy characteristic for a long-time. Similarly, the impacts of these aesthetic changes are relative to the visual receptors near the chosen placement site.

The Recommended Plan would include a recurring minor adverse impact on recreation, noise, and aesthetics at the Rolling Prairie and West Newton Chute sites. The degree of impact at the West Newton Chute site would be greater than under the No-Action Alternative. The site is currently active with material placement and excavation on a routine basis for beneficial use annually and material placed on a periodic basis every 10-15 years. Under the Recommended Plan the boat ramp at West Newton Chute would be closed periodically to facilitate offloading of dredged material via the boat ramp. The ramp would be inaccessible to recreational users when in use for dredge material offloading but attempts would be made to open the ramp for weekends and holidays during the open water boating season. Under the Recommended Plan activities would increase to include offloading dredged material with up to 200 round trips taken, half of which would be fully loaded with dredged material per day annually including winter months,

for transport to and from the Rolling Prairie and West Newton placement sites. Trucks would travel the approximate 1.5 mile route fully loaded along County Road 84 to the Rolling Prairie site to offload material. Trucks would travel past three rural residences located 500 to 1,500 ft from County Road 84. Noise would increase during transfer and placement activities as a result of mechanical equipment and increased vehicle traffic. However, the noise levels would return to baseline once placement activities are complete. The described trucking activities would likely occur once every 5 to 10 years on average, over a duration of several weeks or months, with large scale island offloads determining the schedule. Small scale hauling efforts could occur on an annual basis. These trucking operations are subject to operational flexibility by the Corps of Engineers, and will be briefed in advance via public notice to the general public and local government leadership.

The plan for dredged material placement at the Rolling Prairie site would to have the placed material shaped to provide some topographic relief mimicking the nearby Weaver Dunes area similar to how the Corps has managed the West Newton Chute site. As with the West Newton Chute site under the No-Action Alternative, over time as the maximum elevation for placement is reached at the Rolling Prairie placement site, the sand (minus the beneficial use area) would be covered with topsoil and planted with native prairie grasses. Thus, the severity of aesthetic impacts may be more substantial during the period when the prairie is disturbed and topsoil removed at the West Newton Chute site for transfer and when the Rolling Prairie site is partially filled to capacity and placement activities are active. Ultimately, the level of impact for aesthetics is highly subjective and dependent upon the individual.

Agriculture, Land use, and Controversy. The No-Action Alternative may impact agricultural land. However, the magnitude of the effects is unknown because additional placement areas are unidentified under this alternative. Impacts would appear likely given the abundance of agricultural lands in the Pool 5 floodplain, and the comparatively less environmental regulations associated with placing dredged material on agricultural land compared to other sensitive environmental areas. Impacts to agriculture stems from the complete conversion of land-use from agricultural to unusable, barren sand.

There may be some controversy with the Recommended Plan relating to the conversion of agricultural land to a dredged material placement site at Rolling Prairie. Currently, approximately 650 of the 962 acre Rolling Prairie site is used for row crop agricultural use which would be converted to dredged material placement site use over the next 40-years. This equates to approximately 0.5% of the total 128,000 acres of row crop agriculture present in Wabasha County. Conversion of the land from private agricultural to Federally-owned land could result in a loss of property tax revenue to Wabasha County. Impacts to agriculture land would potentially be substantially greater under the Recommended Plan compared to the No-Action Alternative. To the extent practical, the District will consider measures to minimize impacts over time. For example, the District plans to offer leases that would allow farming to occur on areas of these placement sites until such time that they are needed for dredged material placement. Thus conversion would occur incrementally over the forty year life of the project as the site is filled to capacity. With the identification of specific agricultural areas under the Recommended Plan, the District has coordinated with the U.S. Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) to convey impacts, including those to

potential prime farmland (see Appendix A: Coordination and Correspondence). The USDA/NRCS determined that if prairie restoration as planned of the site following dredged material placement occurs, there will be no irreversible conversion of important farmland to nonagricultural uses.

Transportation. The No-Action Alternative may impact transportation. The magnitude of the effects is unknown because placement areas and associated movement of material to those sites are unidentified under this alternative. Impacts would appear likely given the increased challenges of floodplain placement of dredged material in Pool 5. Placement of material outside the floodplain would likely involve truck movement, which may strain infrastructure and exacerbate traffic concerns.

The use of the new Rolling Prairie placement site under the Recommended Plan will require a substantial amount of dredged material to be moved by truck over a 1-2 mile stretch of County Road 84 between the West Newton Chute and Rolling Prairie placement sites. Given the short travel route in a rural area with only three rural residences along the County Road 84 travel route, there should be minor adverse effects to traffic. Given the close proximity of the sites, trucking could occur year round to include during winter months. During trucking operations, it is estimated that 200 or more additional heavy truck round trips per day could occur on County Road 84 over an extended period of time.

Additional truck traffic on County Road 84 is unlikely to increase congestion on area streets and highways given low number of rural residence present, thus there should be no increased risk of vehicle collisions. Increase truck traffic would likely increase wear and tear on County Road 84. Impacts would occur during periods when material is being relocated from one placement site to another, and likely would not be more than 180 days per year.

Environmental Justice. It is unlikely the No-Action Alternative would significantly impact minority, low-income or other groups. Although the long-term placement areas and associated movement of material to those sites are unidentified under this alternative, it appears unlikely such an action would disproportionately affect disadvantaged groups.

The use of the Rolling Prairie placement site under the Recommended Plan would occur within a single block group identified through the EPA Environmental Justice Mapping tool (2018). While social and economic effects would occur under the Recommended Plan, it appears unlikely these effects would be disproportionately applied to low-income, minority or other groups. Given the close proximity of the Rolling Prairie and West Newton placement sites, and localized activity, the greatest effects would occur at the individual level (affected landowners) and not among broader socioeconomic groups.

7.2 Natural Resource Effects

7.2.1 PHYSICAL SETTING

Hydrology. The No-Action Alternative may temporarily impact the one-percent flood profile. The magnitude of such an effect, if it would occur, is unknown because placement areas are unidentified under this alternative. Emergency side-cast placement of material adjacent to the channel may increase flood heights as long as that material persisted. However, the effects would be temporary because the dredged material would be moved to a location either outside of the floodplain or to an area already considered within the current flood map. Maintenance dredging usually follows high water or flood flow events.

The use of the Rolling Prairie placement site under the Recommended Plan would have no effect on the one-percent flood profile. The proposed new placement site within the Recommended Plan is outside of the 100-year floodplain and would not impact flood heights for a 100-year event. Existing drainage patterns within the site following placement of dredged material may be interrupted. However, material placed in areas that would impede water drainage patterns will be graded and new culverts added to facilitate run off and avoid pooling. Existing culverts will not be blocked and will remain functional. Placement of material near the levee bordering the Zumbro River along the northeast portion of the site will be set back sufficiently so that the levee can be maintained and existing drainage patterns are not disturbed. If the swale along the northwest portion of the site is filled with material, a new ditch along the toe of the material will be established and flap gated culvert installed in the existing levee to route run off.

7.2.2 AQUATIC HABITAT/WETLANDS

Under the No-Action alternative, there may be adverse impacts to aquatic habitat or wetlands of an unknown magnitude. The magnitude of the effects is unknowable because both the dredging quantities and placement areas are unidentified under this alternative. Placement of materials in aquatic habitats or wetlands is typically avoided, if at all possible, but may be necessary under certain conditions and if no alternative, practicable placement sites can be identified. Impacts typical of dredged material placement in aquatic areas include the smothering of any substrate-dwelling macroinvertebrates present at the site and conversion of the area to a sandy substrate (or conversion to land, if enough material is placed). Ultimately, the risk for undesirable effects to biological resources is greater under this alternative relative to the Recommended Plan.

The Recommended Plan would have no impacts to wetlands in the near-term. Approximately 160 of the 962 acres of the Rolling Prairie placement site contains wetland and would be avoided during dredged material placement to the extent practicable for the duration of the plan. Appendix E contains results of a wetland assessment which identify wetland signatures that strongly correlate with concave and flat landscape positions and elevations at 670' and lower. However, if avoiding wetlands later becomes impracticable due to capacity needs, the District will prepare a Section 404(b)(1) evaluation before the wetland is filled. In addition, the District would mitigate for any unavoidable wetland impacts according to current policy at that time.

At this time, it is assumed that the only means of placement at the Rolling Prairie site would be by mechanical means. Therefore, no carriage water nor associated run off would result from the Recommended Plan.

7.2.3 TERRESTRIAL HABITAT

Under the No-Action Alternative, there may be adverse impacts to terrestrial habitat of an unknown magnitude. The magnitude of effects is unknowable because the placement areas are unidentified under this alternative.

Placement of materials in native or valuable terrestrial habitats is typically avoided, if possible, but may be necessary under certain conditions and if no alternative, practicable placement sites can be identified. There is an increased risk that without pre-identified sites the Corps would have to do emergency placement in terrestrial habitat. While undesirable, this could happen in the event of an emergency closure of the navigation channel. Impacts typical of dredged material placement in terrestrial areas include the clearing of trees and smothering of understory vegetation. Any terrestrial areas used for dredged material placement would be transformed into relatively barren sandy areas. Mobile biota would temporarily avoid the area during disturbance, and could avoid the area longer if habitat is substantially altered. Ultimately, the risk for undesirable effects to terrestrial habitat is greater under this alternative relative to the Recommended Plan.

The Recommended Plan would have a minor short term adverse effect but a minor long term beneficial effect on terrestrial habitat and associated wildlife. Under this alternative, the majority of placement would be on existing agricultural land, which has limited value as terrestrial habitat. Wildlife using the new Rolling Prairie placement site for feeding or other uses would be disturbed during and displaced following placement of dredged material. However, other agricultural lands found throughout the area would provide similar functions. These temporary impacts would occur yearly to meet the long-term needs for dredged material placement. Tree clearing to facilitate access is not anticipated. The Rolling Prairie site will be restored to native prairie after dredged material is placed providing minor long term beneficial effects to terrestrial habitat and associated wildlife at the site.

7.2.4 THREATENED AND ENDANGERED SPECIES

Under the No-Action Alternative, the effects to threatened and endangered species are unknown because both the dredging quantities and placement areas are unidentified. If possible, the Corps would avoid placing dredged material in areas where endangered species have been found or where they may have a likelihood of occurring. However, there is an increased potential risk that without pre-identified sites the Corps would have to do emergency placement in potentially sensitive areas such the main channel border. While extremely rare, the endangered Higgins eye is present in Pool 5 and could be impacted by unplanned side cast placement. Similarly, unplanned emergency placement in adjacent floodplain areas could disrupt bald eagles.

Although the bald eagle (*Haliaeetus leucocephalus*) is no longer protected under the Endangered Species Act, it remains protected under the Bald and Golden Eagle Protection Act. Although typically required for preparation of dredge material placement activities at newly acquired sites,

tree clearing to facilitate placement of dredged material will likely not be required for the Recommended Plan, thus no effects to northern long-eared bats are anticipated.

The Corps has determined that no Federally-listed threatened or endangered species would be impacted under the Recommended Plan. The following paragraphs describe the rationale for this determination:

- No suitable habitat for freshwater mussels, including the Higgins eye, sheepsnose, or spectaclecase, as described in Chapter 2.5.5, would be impacted under the proposed project.
- The proposed action would not include wide-spread clearing of forest or individual trees. Therefore, impacts to roosting or rearing areas are not anticipated and no effects to northern long-eared bat are expected.
- No suitable habitat for eastern massasauga rattlesnake would be expected in the newly acquired Rolling Prairie site. The newly proposed sites are upland and are largely agricultural lands or otherwise disturbed areas. No effects to this species would be expected from the proposed action.
- No suitable habitat for rusty patch bumblebee would be expected in the newly proposed placement areas. The newly acquired Rolling Prairie site is largely agricultural land or otherwise disturbed areas. No effects to this species would be expected from the proposed action.
- If an eagle nest is discovered within proximity to the placement site, measures to avoid and minimize impacts to the eagles would be evaluated and incorporated into the project as necessary (in accordance with the National Bald Eagle Management Guidelines), and the action would be coordinated with the USFWS.

State-Listed Rare Species. Under the No-Action Alternative, the effects to State Listed rare species are unknown because both the dredging quantities and placement areas are unidentified.

Because the Recommended Plan sites are terrestrial, the assessment of State Listed rare species will focus on terrestrial and wetland species. No suitable aquatic habitat for freshwater mussels or fish would be impacted under the Recommended Plan. No suitable terrestrial or wetland habitat would be impacted by the acquisition and use of the Rolling Prairie site. The site is primarily agricultural land or previously disturbed and would not be expected to serve as primary habitat for State Listed species. No effects are expected to State Listed species from the use of the West Newton Chute site and transfer of material. The site is an active disturbed dredged material placement site that doesn't provide suitable terrestrial or wetland habitat.

Potential State of Minnesota-listed species were identified from information available in the Minnesota Natural Heritage Database (MNHD). Locations of the new proposed placement sites were compared to available MNHD data within ArcView GIS to identify the presence of potential State listed species. This list was filtered to those species that could potentially be present at the proposed new placement areas. Minnesota species of concern are listed in Table 7.

Table 7. Minnesota Terrestrial State Protected Species with Records that could be within One Mile of the Recommended Plans New Dredge Material Placement Sites*.

Common Name	Scientific Name	Status in Minnesota**
Plants		
Clasping Milkweed	<i>Asclepias amplexicaulis</i>	THR
Davis' Sedge	<i>Carex davisii</i>	THR
Gray's Sedge	<i>Carex grayi</i>	SC
Green Dragon	<i>Arisaema dracontium</i>	SC
Rhombic Evening Primrose	<i>Oenothera rhombipetala</i>	SC
Seaside Three-Awn	<i>Aristida tuberculosa</i>	SC
Swamp White Oak	<i>Quercus bicolor</i>	SC
Sweet-Smelling Indian Plantain	<i>Hasteola suaveolens</i>	END
Yellow-Fruit Sedge	<i>Carex annectens</i>	SC
Reptiles/Amphibians		
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR
Gophersnake	<i>Pituophis catenifer</i>	SC
Wood Turtle	<i>Glyptemys insculpta</i>	THR
Birds		
Bell's Vireo	<i>Vireo bellii</i>	SC
Lark Sparrow	<i>Chondestes grammacus</i>	SC
Red-Shouldered Hawk	<i>Buteo lineatus</i>	SC

*Copyright 2019, State of Minnesota, Department of Natural Resources (DNR). Rare Features Data included here were provided by the Division of Ecological and Water Resources, Minnesota DNR, and were current as of January, 2019. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean that no significant features are present.

** (END = Endangered; THR = Threatened; SC = Special Concern).

Prior to placement of dredged material at the Rolling Prairie site when specific areas identified for material are known, best management practices and avoidance measures for impacts to state listed turtle species, Blanding's turtle and wood turtle, will be coordinated with MNDNR Environmental Review Coordinator.

7.2.5 AIR QUALITY

Both the No-Action and the Recommended Plan would have a temporary, recurring, minor adverse effect on air quality, both of a similar scope, but likely in different locations within the pool.

Construction air quality effects would consist primarily of emissions from construction equipment, including the dredge, barges, skiffs, excavators, dozers, and dump trucks. The area surrounding the proposed project is in attainment for all criteria pollutants, meaning air quality in the area is relatively good.

Under the No-Action Alternative, effects to air quality would be as described in the CMMP EIS for as long as capacity remains at available placement sites in Pool 5. If material placement

needs exceed capacity, effects would depend on the options chosen for material placement, which are currently unknown.

The Recommended Plan would result in recurring, minor adverse effects to air quality. Emissions would be generated by increased truck traffic in the study area during periods when trucks are transporting sand to and from the two placement sites. The Recommended Plan has been reviewed for compliance with the rules provided by the Federal Clean Air Act and for potential impacts of project-generated greenhouse gas emissions and their effect on climate change.

The 1990 Federal Clean Air Act Amendments dictate that a conformity review be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment area for one or more of the six NAAQS criteria pollutants. Wabasha County is in “attainment” of the NAAQS for each of the criteria pollutants, so no conformity review is required for the proposed project.

Greenhouse gas (GHG) emissions and their effect on climate change are global issues resulting from numerous and varied sources, with each source making a relatively small addition to global atmospheric GHG concentrations, but which collectively have a large impact on a global scale. Although climate changes in the past have been caused by natural factors, human activities are now the dominant agents of change. Human activities are affecting climate through increasing atmospheric levels of heat-trapping gasses, including those emitted by the combustion of fossil fuels (e.g., Mellilo et al. 2014). The proposed project would be expected to produce greenhouse gasses during project activities in the form of exhaust from various types of machinery used for material transport and material placement. The Council for Environmental Quality (CEQ) released final guidance in August 2016 recommending that agencies use projected GHG emissions associated with proposed actions as a proxy for assessing proposed actions’ potential effects on climate change, along with a qualitative summary discussion of the impacts of GHG emissions to present the environmental and public health impacts of the proposed action.

The amount of greenhouse gas emissions can vary widely due to many variables, including (but not limited to) the type and condition of equipment used, and the distance the material is moved. Approximately 35 additional heavy trucks per day could be on local roadways annually. The distance traveled would be approximately a 3.0 mile round-trip distance between the West Newton Chute and Rolling Prairie sites, this equates to 37,800 miles of hauling annually. Using reported figures for the average fuel usage of typical dump trucks (DOE 2015) and the life-cycle GHG emissions associated with production, transport, and consumption of diesel fuel, it is estimated that transport and placement associated with this level of truck traffic would result in the release of between 79-189 metric tons of CO₂-equivalent greenhouse gas emissions per year.

Project activities would comply with applicable Federal, state, and local laws regarding pollution control mechanisms on equipment.

7.3 Cultural Resource Effects

Under the No-Action Alternative, the effects to cultural resources are unknown because both the dredging quantities and placement areas are unidentified. If possible, the Corps would avoid placing dredged material in areas where cultural resources have been found or where they may have a likelihood of occurring. However, there is an increased potential risk that without pre-identified sites the Corps would have to do emergency placement in potentially sensitive areas harboring cultural resources.

The proposed project has the potential to impact cultural resources. The project area has not yet been surveyed for cultural resources. Portions of the project area contain a high probability to contain precontact archaeological sites, namely topographic high spots (e.g., elevations above 670 feet above mean sea level) adjacent to former channels of the Zumbro River, along terraces and relict dunes. Aerial photographs and historic maps indicate that at least three farmsteads occupied the area since the early 20th Century. Eleven precontact sites (burial mound groups, lithic and artifact scatters) are documented within one mile of the project area.

Because cultural resource surveys have not been completed it is unknown if any cultural resources that may be identified in the project area are significant and eligible for listing on the NRHP. It is unknown if human burials, both precontact and historic, are located within the project area. If significant sites and human remains are identified, portions of the project area may be precluded from dredged material placement activities. In this eventuality, development of appropriate cultural resources management plans in consultation with various partners (e.g., Native American groups, U.S. Fish and Wildlife Service, Office of the State Archaeologist, State Historic Preservation Office [SHPO], etc.) will be necessary.

Because it is not possible to assess effects to cultural resources at this point in the project, the Corps has developed a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation, the SHPO, Native American groups and other parties (Appendix F). The PA outlines procedures to identify, evaluate, and manage cultural resources within the project area prior to any dredged material placement activities.

7.4 Cumulative Effects

The Recommended Plan is a component of the much larger set of plans and actions undertaken as maintenance of the 9-Foot Navigation Channel on the UMR. The cumulative effects of the Recommended Plan would include those discussed in the 1997 CMMP EIS (USACE 1997), as well as additional impacts that would come with use of the newly acquired Rolling Prairie dredged material placement site including handling and transport of material from the existing West Newton Chute placement site.

7.4.1 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

Cumulative effects are defined by the Council on Environmental Quality as, “[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” 40 CFR § 1508.7.

7.4.2 ACTIONS IDENTIFIED WITHIN THE PROJECT IMPACT ZONE

Chapter 3 discusses past and ongoing projects that have been identified in the vicinity of UMR Pool 5 that also impact local resources. These include a designated wildlife refuge and habitat improvement project; and a number of transportation related activities including the UMR navigation channel, commercial and recreational boat harbors, barge mooring facility at a coal fired power plant, and three railroads. In addition to assessing the cumulative effects for past and ongoing projects, future foreseeable projects in the vicinity of the UMR Pool 5 also need to be addressed.

The following past, present, and reasonably foreseeable future actions were identified as having the potential to interact with or have impacts related to those of the proposed project.

PAST ACTIONS

MODIFICATIONS TO THE UPPER MISSISSIPPI RIVER FOR NAVIGATION

The floodplain geomorphology, stream hydraulics, and water levels of the Upper Mississippi River have been modified by impoundment and other navigation features since the 1820s. The most relevant navigation improvement actions within the project impact area are likely the construction of hundreds of channel training structures placed between 1866 and 1907 as part of the 4-foot, 4.5-foot, and 6-foot navigation channel projects. Following the construction of these structures was the construction of Lock and Dam Number 5 in 1935, which raised water levels by several feet in the immediate project area and allowed for a 9-foot-deep navigation channel. The cumulative effect of these actions has played a large role in the development of the habitat that currently exists in the project area.

NATIONAL WILDLIFE REFUGE

The UMR National Wildlife and Fish Refuge was established in 1924 as a refuge for fish, wildlife, and plants and a breeding place for migratory birds. The Refuge encompasses one of the largest blocks of floodplain habitat in the lower 48 states, and stretches through four states along the Mississippi River: Minnesota, Wisconsin, Iowa, and Illinois. Bordered by steep wooded bluffs that rise 100 to 600-ft above the river valley, the Mississippi River corridor and refuge offer scenic beauty and productive fish and wildlife habitat unmatched in the heart of

America. The Refuge covers just over 240,000-acres and extends 261 river miles from north to south at the confluence of the Chippewa River in Wisconsin to near Rock Island, Illinois.

RAILROADS.

While railroads parallel both sides of the river, there are no railroad bridge crossings of the Mississippi River in Pool 5. On the Wisconsin side, a pair of Burlington Northern and Santa Fe railroad tracks lie riverward of State Hwy 35. On the Minnesota side, a pair of Canadian Pacific railroad tracks are set back from the river and generally follow along U.S. Hwy 61. Both rail lines were constructed prior to 1890 and have been operational to this day

CONSTRUCTION OF THE COMMERCIAL AND RECREATIONAL HARBORS.

Great River Harbor is a small marina and campground located near Belvedere Slough on the Wisconsin shoreline. There are no other commercial marinas in the study area.

DAIRYLAND POWER COOPERATIVE.

A barge mooring and unloading facility was constructed adjacent to the main channel in the late 1940s at the retired Alma Station power plant located just south of Alma, Wisconsin in Buffalo County near river mile 751. The John P. Madgett coal fired electrical power station was constructed on the site in the 1970s and continues to utilize the Alma Station barge mooring and unloading facility.

WEAVER BOTTOMS.

In the mid-1980s the Corps constructed two new islands (Swan and Mallard) and stabilized others in Weaver Bottoms under the Channel Maintenance program. The Corps has modified and maintained the islands since initial construction. The project resulted in improved floodplain habitat, redirected flows, reduced impacts of wind-generated wave action, and enhanced and protected vegetation. Trees were planted on the islands for future eagle nesting, sand areas were developed for turtle nesting, and mud flats were developed to promote vegetation growth for waterfowl and shorebird loafing and feeding areas. Backwater dredging was performed to increase connectivity and bathymetric diversity for fisheries.

MCCARTHY LAKE WILDLIFE MANAGEMENT AREA

The Minnesota DNR has established and manages the 3,129 acre McCarthy Lake WMA which lies immediately adjacent to the southern border of the Rolling Prairie site. The site is managed with an emphasis on maintaining a rich, diverse interspersed of numerous communities throughout the wildlife area. Timber management, prescribed burning, nesting cover development and maintenance practices are utilized. The WMA contains mixed upland and lowland hardwoods of oak, maple, ash, birch, cottonwood and willow. Upland fields consist of native warm and cool season grasses. The former channel of the Zumbro River dissects the unit and has created numerous wetlands including wild rice. Recreation is dominated by hunting, trapping, fishing and general wildlife observations. Sandhill cranes, eagles, tundra swans and numerous shore birds may be commonly observed.

WEAVER DUNES PRESERVE AND KELLOGG WEAVER DUNES SCIENTIFIC AND NATURAL AREA

The Nature Conservancy (TNC) established the 1,516 acre Weaver Dunes Preserve near Kellogg, MN near the Rolling Prairie site. In 1982, TNC sold the northern 697 acres of the site to the MNDNR which established the Kellogg Weaver Dunes SNA. TNC currently manages the remaining 819 acres as the Weaver Dunes Preserve. Collectively the sites contain a unique prairie and sand dune and terrace ecosystem that offers important habitat for many rare plants, insects, and animal species. The site is an Audubon Important Bird Area and provides primary nesting habitat for the Blanding's turtle, one of the most significant populations of the species throughout its limited range in the U.S. and Canada.

CONCURRENT AND ONGOING ACTIONS

NAVIGATION ON THE UMR

The operation, maintenance, and navigation use of the main channel of the UMR at its current authorized level is expected to continue into the future.

DREDGED MATERIAL MANAGEMENT : LOST ISLAND OFFLOAD – WEST NEWTON CHUTE PLACEMENT

The offloading of the stored dredged material from the Lost Island Temporary Placement Site to the West Newton Chute Placement Site for permanent and beneficial use is currently being conducted. The project involves transferring up to 1,300,000 CY of material from 2016 to 2019. The project provides future capacity at the Lost Island Temporary Placement Site for dredged material to ensure the continued availability of the 9-foot navigation channel for commercial navigation for the 9-Foot Navigation Channel project within the St. Paul District.

REASONABLE FORESEEABLE FUTURE ACTIONS

To satisfy the requirements of the plan for placement of material over 40 years, property needed to be acquired from willing sellers within the Pool 5 project area interested in selling all of their property in a one-time payment. Parsing out the land and buying it in piecemeal was not an option at this site. Approximately 4,700,000 CY of dredged material will be placed over 40 years out of a total capacity of 18,500,000 CY available at the Rolling Prairie site. This leaves an area capable of holding 13,800,000 CY of material unused for the foreseeable future. Smaller sub areas within the site will be filled incrementally until desired capacity is reached. Land not being used for placement will remain in the same state that the land is currently in (i.e. agricultural row crop and wetland). Land adjacent to the site is primarily row crop agricultural with lesser amounts owned and managed by the MNDNR and TNC as wildlife and natural areas. Likewise, it's anticipated these land uses will continue to be used in their present state into the foreseeable future.

CONSEQUENCES OF CUMULATIVE EFFECTS

The proposed action includes the continued use of an existing and active placement site (West Newton Chute) and the use of newly acquired placement site (Rolling Prairie) of which the

majority is upland and in active agricultural production with ongoing disturbance and limited natural resources. The proposed action will not have an adverse significant impact to natural resources when added collectively to the other past, present and reasonably foreseeable actions in Pool 5. The Rolling Prairie site will be restored to native prairie after dredged material is placed providing minor beneficial effects to natural resources in the area. The proposed project would have no significant cumulative adverse or beneficial effects.

TRANSPORTATION AND COMMERCIAL NAVIGATION

The transportation related projects (including the Recommended Plan) provide a cumulative benefit of maintaining and improving transportation routes and modes in the project area, including commercial navigation on Pool 5. The outcome of the future disposition study would affect commercial navigation in the upper pools, but the effect on navigation in Pool 5 would likely be limited and there would be no cumulative adverse effect from the proposed action.

NATURAL RESOURCES.

Many of the identified projects have had both positive and negative impacts on natural resources in the region. The transportation projects such as the railroads, harbors, and existing navigation channel likely impacted terrestrial and aquatic habitat and wetlands in the Mississippi River floodplain when they were constructed. The National Wildlife Refuge, Weaver Bottoms project, McCarthy Lake WMA, and the Weaver Dunes Preserve in the area preserve and protect thousands of acres of terrestrial, aquatic, and wetland habitat. The proposed project is not anticipated to impact aquatic habitat or wetlands and will only have a marginal short term adverse impact to terrestrial habitat and associated wildlife and biological productivity but would be temporary and expected to have no long term appreciable impacts regionally.

At the Rolling Prairie site, land not being used for placement of dredged material would be left in its current state and after placement of material would be restored to native prairie. Upon filling sub areas within Rolling Prairie to capacity, the dredged material will be shaped to topographically mimic adjacent natural areas, covered with topsoil, and planted with native prairie grasses. Restored prairie within Rolling Prairie should remain into the foreseeable future thus restoring row crop agricultural land to its previous state and providing a long term benefit to natural resources by increasing the extent and connectivity of natural prairie and wetlands within the area.

CHAPTER 8.

Environmental Compliance and Review

8.1 Applicable Environmental Laws and Executive Orders

The proposed action would comply with Federal environmental laws, EOs and policies, and applicable state and local laws including but not limited to the Clean Air Act, as amended; the Clean Water Act, as amended; the Endangered Species Act of 1973, as amended; the Fish and Wildlife Coordination Act of 1958, as amended; the Land and Water Conservation Fund Act of 1965, as amended; the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969, as amended; EO 11990, Protection of Wetlands; EO 12898, Environmental Justice; the Farmland Protection Policy Act of 1981; and EO 11988, Floodplain Management.

8.2 Public Involvement

A public notice of availability of the Draft Report was published on 13 September 2019 on the Corps website (www.mvp.usace.army.mil/Home/PublicNotices.aspx). A public meeting was held at the St. Agnes Church in Kellogg, MN on 26 September 2019 to discuss the project and obtain public input. The 30 day public review period of the Draft Report ended 18 October 2019. The results of the meeting and comments obtained from the review period are documented in Appendix H, *Agency and Public Comments with Responses*.

8.3 Coordination

Planning for the overall project has been coordinated with the public, state and Federal agencies, and other interested parties. Descriptions of compliance efforts for certain regulations are found in Table 8 and as follows:

8.3.1 CLEAN WATER ACT

Discharges of dredged or fill material into waters of the United States must comply with Section 404 of the CWA. The Recommended Plan is not anticipated to impact any wetlands. Impacts to wetlands will be avoided during dredged material placement at the Rolling Prairie site to the extent practicable for the duration of the plan. However, if avoiding wetlands later becomes impracticable due to capacity needs, the District will conduct an evaluation in accordance with Section 404(b)(1) of the Clean Water Act, prior to placing any fill in wetlands. When hydraulic dredging methods are used to place material at the West Newton Chute site, excess carriage

water would be returned to the river. This discharge is addressed in Nationwide Permit 16, which also includes Section 401 Water Quality Certification from the MPCA

8.3.2 RIVERS AND HARBORS ACT

Compliance with Section 10 of the Rivers and Harbors Act of 1899 is required for activities conducted below the Ordinary High Water elevation of navigable waters of the United States (33 U.S.C. 403). The proposed action would be in compliance with Section 10. Use of these new placement sites would not result in any appreciable differences with dredging operations as it relates to Section 10 compliance, relative to existing dredging activities.

8.3.3 ENDANGERED SPECIES ACT

In compliance with the Endangered Species Act of 1973 (16 U.S.C. § 1531), project plans have been coordinated with the USFWS (Appendix A). USFWS also will have the opportunity to review this report and Environmental Assessment.

8.3.4 FISH AND WILDLIFE COORDINATION ACT

In compliance with the Fish and Wildlife Coordination Act (16 U.S.C. 661-667), project plans have been coordinated with the USFWS and the Minnesota and Wisconsin DNRs (Appendix A). These agencies also will have the opportunity to review this report and Environmental Assessment.

8.3.5 STATE PERMITS

No fill of material, carriage water return or associated run off, or work in state of Minnesota waters is anticipated as dredged material will involve upland mechanical transfer and placement of material from the West Newton Chute site to the Rolling Prairie site, thus no 401 Water Quality Certification or Public Waters Works Permit from Minnesota is required for use of the Rolling Prairie site. The Rolling Prairie site will be added to the Minnesota Pollution Control Agency (MPCA) Solid Waste Disposal Site (SDS) programmatic permit for Corps dredged material placement sites prior to dredged material placement activities.

8.3.6 CULTURAL RESOURCES

The Recommended Plan is a Federal undertaking which may have the potential to cause adverse effects on historic properties. Therefore, it is subject to the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 306108, et seq.) (NHPA) and its implementing regulations 36 CFR Part 800 - Protection of Historic Properties.

Development and execution of a programmatic agreement (PA) is appropriate and has been executed pursuant to 36 CFR § 800.14(b)(1)(ii) (Appendix F). Consulting parties include the Advisory Council on Historic Preservation, the Minnesota State Historic Preservation Office, various Native American groups and possibly other parties.

8.3.7 FARMLAND PROTECTION POLICY ACT

In compliance with the Farmland Protection Policy Act (FPPA) of 1981, the United States Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) has been coordinated with regarding irreversible conversion of prime and important farmland to non-agricultural uses. Although Prime Farmland occurs on the Rolling Prairie site, it's the USDA/NRCS determination that if prairie restoration as planned of the site following dredged material placement occurs, there will be no irreversible conversion of important farmland to nonagricultural uses.

8.4 Distribution of Draft Environmental Assessment

This EA has been provided via computer on the following website:

<http://www.mvp.usace.army.mil/Home/PublicNotices.aspx>. A notice of availability was sent to interested citizens and the following agencies:

FEDERAL

U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Coast Guard
U.S. Department of Agriculture

OTHERS

Libraries and City Hall Offices of Kellogg and Wabasha, Minnesota; Buffalo City and Alma, Wisconsin

Property Owners

STATE OF WISCONSIN

Department of Natural Resources

Adjacent Property Owners

RAILROADS

STATE OF MINNESOTA

Department of Natural Resources
Pollution Control Agency

Canadian Pacific Railroad
Burlington Northern Santa Fe Railroad

8.5 Comments on the Environmental Assessment

Comments were requested and welcomed on the draft report and environmental assessment from September 16, 2019 to October 18, 2019. All public comments were carefully considered and are addressed in Appendix H: Agency and Public Comments with Responses. If there are additional inquiries and questions, please send them to the St. Paul District, U.S. Army Corps of Engineers, ATTN: Mr. Dan Kelner, CEMVP-PD-C, 180 Fifth Street East, Suite 700, St. Paul, MN 55101, or by email to: Daniel.E.Kelner@usace.army.mil.

Table 8. Compliance Review with All Applicable Environmental Regulations and Guidelines.

Environmental Requirement	Compliance ¹
<i>Federal Statutes</i>	
Archaeological and Historic Preservation Act	Full
Bald and Golden Eagle Protection Act of 1940, as amended	Full ²
Clean Air Act, as amended	Full
Clean Water Act, as amended	Full
Coastal Zone Management Act, as amended	N/A
Endangered Species Act of 1973, as amended	Full
Federal Water Project Recreation Act, as amended	Full
Fish and Wildlife Coordination Act, as amended	Full
Land and Water Conservation Fund Act of 1965, as amended	Full
Migratory Bird Treaty Act of 1918, as amended	Full
National Environmental Policy Act of 1969, as amended ³	Full
National Historic Preservation Act of 1966, as amended ⁴	Full
National Wildlife Refuge Administration Act of 1966	Full
Noise Pollution and Abatement Act of 1972	Full
Watershed Protection and Flood Prevention Act	N/A
Wild and Scenic Rivers Act of 1968, as amended	N/A
Farmland Protection Policy Act of 1981	Full
<i>Executive Orders, Memoranda</i>	
Floodplain Management (EO 11988)	Full
Protection and Enhancement of Environmental Quality (EO 11514)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990)	Full
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum, 30 August 1976)	Full

¹ The compliance categories used in this table were assigned according to the following definitions:

- a. Full - All requirements of the statute, EO, or other policy and related regulations have been met for the current stage of planning.
- b. Partial - Some requirements of the statute, EO, or other policy and related regulations remain to be met for the current stage of planning.
- c. Noncompliance (NC) - Violation of a requirement of the statute, EO, or other policy and related regulations.
- d. Not Applicable (N/A) - Statute, EO, or other policy and related regulations not applicable for the current stage of planning.

² No bald eagles currently reside in the study area.

³ Full compliance of National Environmental Policy Act of 1969, as amended will be achieved with the District Engineer's signing of the Finding of No Significant Impact (Appendix C).

⁴ A Programmatic Agreement has been signed and compliance satisfies the Corps' Section 106 responsibilities for all individual undertakings of the program covered by the agreement, see 36 CFR 800.14(b) (Appendix F).

CHAPTER 9. References

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