

DEPARTMENT OF THE ARMY U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT 1222 SPRUCE STREET ST. LOUIS, MISSOURI 63103-2833

5 June 2025

The St. Louis District, U.S. Army Corps of Engineers, has prepared a draft Project Implementation Report with Integrated Environmental Assessment (PIR/EA), titled, *Navigation and Ecosystem Sustainability Program (NESP) Horse Island Ecosystem Restoration Project, Unimpounded Middle Mississippi River Miles (RM) 113-111, Randolph County, Illinois* dated, May 2025. The District is interested in review and comments regarding the analysis and outcomes for this project to fulfill the National Environmental Policy Act (NEPA) of 1969 requirements. The report and associated appendices can be found here: https://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/NESPHorseIslandEcosystemRestoProject PIRIEA.pdf

The draft PIR/EA is available for public review from June 6 – July 6, 2025. Comments may be submitted via email to: CEMVS_Planning@usace.army.mil, or by writing to the address below with the title of the Project. To request a hard copy, call (314) 925-5004, write to the address below, or use the above email.

U.S. Army Corps of Engineers, St. Louis District Attn: Environmental and Planning Branch PD-C, Hill Environmental Compliance Section 1222 Spruce Street St. Louis, MO 63103-2833

PROJECT INFORMATION

NESP is a long-term, dual-purpose program that aims to increase capacity and reliability of the inland navigation system while restoring, protecting and enhancing the environment of the Upper Mississippi River.

The Horse Island Ecosystem Restoration Project fits within the larger NESP goal by aiming to maintain, enhance and restore quality habitat for native and desirable plant, animal and fish species for a resilient and sustainable ecosystem. The proposed Project would (1) restore floodplain forest communities, (2) restore topographic variation supporting forest and wetland communities and (3) restore and enhance the quality and diversity of wetland habitat.

Measures and features proposed for the Project would include:

- Tree planting to restore currently open and vegetatively degraded areas to high quality native floodplain forest
- Forest Stand Improvement (FSI) to enhance and improve the quality of existing forest stands
- Wetland restoration to enhance and improve the quality of existing wetland areas
- Excavation to restore ridge and swale landforms, enhancing topographic diversity

The purpose of this PIR/EA is to document existing conditions, evaluate potential impacts associated with each alternative and assist in planning and decision making for the Horse Island Ecosystem Restoration Project.

Sincerely,

Brian Johnson Date: 2025.06.05 07:17:08

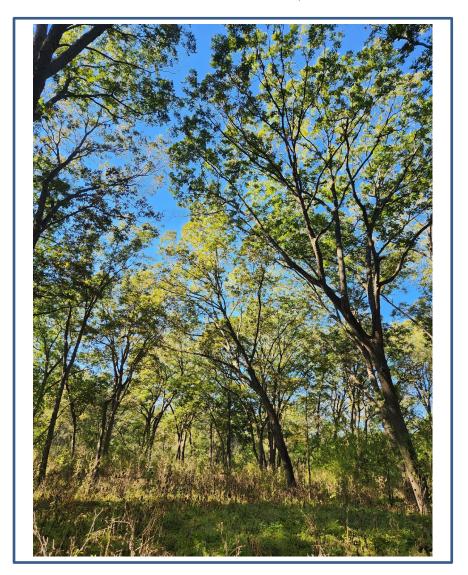
Brian L. Johnson. Chief, Environmental Compliance Branch

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM

PROJECT IMPLEMENTATION REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

HORSE ISLAND ECOSYSTEM RESTORATION PROJECT

UNIMPOUNDED, MIDDLE MISSISSIPPI RIVER MILES (RM) 113-111 RANDOLPH COUNTY, IL





May 2025 DRAFT

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM PROJECT IMPLEMENTATION REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

HORSE ISLAND ECOSYSTEM RESTORATION PROJECT

OPEN RIVER, MIDDLE MISSISSIPPI RIVER MILES RM 113-111 RANDOLPH COUNTY, IL

EXECUTIVE SUMMARY

Purpose of the Report: The purpose of this project implementation report (PIR) with environmental assessment (EA) (report), including the anticipated Finding of No Significant Impact (FONSI), is to document the decision-making process for the proposed U.S. Army Corps of Engineers (USACE), NESP Horse Island Ecosystem Restoration Project. The proposed project focuses on forest diversity and topographic diversity at the Horse Island Division of the Middle Mississippi River National Wildlife Refuge (NWR; Refuge).

This report was developed by the USACE serving as the lead federal agency in collaboration with the U.S. Fish and Wildlife Service (USFWS) as the federal Sponsor.

Project Area Description: The Horse Island Division of the Middle Mississippi National Wildlife Refuge (hereafter referred to as the Refuge) is located on the Mississippi River downstream from St. Louis, Missouri within the Middle Mississippi (MMR), stretching from River Mile (RM) 195-0. The Horse Island Division is near Kaskaskia, Illinois at RM 113-111 on Kaskaskia Island. Lands in the study area are within the Refuge boundary and are owned by USFWS; there are also privately owned inholdings. The study area comprises a total of 2,052 acres and consists of bottomland forest (floodplain forest, riverfront forest, willows), old field (fallow agricultural fields, scrub shrub) wetland, backswamp, swamp-shrubland and open water habitats),habitat on the riverside of the levees. Current land use is approximately 20% non-forested abandoned agricultural fields, and 80% forest communities.

Problem Identification: Bottomland forest and backswamp communities within the Horse Island Division, RM 113-111 have severely declined in extent, diversity (age, structure, and species), and resiliency over the past 150 years. This can be attributed to changes in hydrology and hydraulics from the implementation and operation of the 9-foot navigation channel, land use changes, the spread of invasive species, and changing environmental conditions. This is a trend across the entire Middle Mississippi Reach (RM 195-0) as the loss of forest cover and community diversity (particularly bottomland hard mast), increased fragmentation, and decline in forest and wetland health provide reduced habitat suitability and resources for wildlife, such a neotropical migratory birds.

Project Objectives: The timing of the objectives is the 50-year period of analysis (2028 – 2078) and the location is the project area. The project-specific objectives are summarized below:

- Primary Objective 1: Restore floodplain forest communities.
- Primary Objective 2: Restore topographic variation supporting forest and

wetland communities.

• Secondary Objective: Restore and enhance the *quality and diversity of wetland* habitat.

Plan Formulation, Evaluation, and Comparison: The USACE planning process is a structured systematic and repeatable planning approach to ensure sound decisions are made in accordance with the processes laid out in the Planning Guidance Notebook (Engineer Regulation (ER) 1105-2-103) and the Principles and Guidelines for Federal Water Resource projects. This report describes the development, screening, and evaluation of management measures and alternative plans. The project delivery team (PDT), which includes biologists, engineers, economists, and planners from the USACE, developed a series of alternatives for consideration.

Plan Selection: A final array of alternatives was developed, including the No Action, Minimum 1 (tree planting and FSI), Minimum 2 (ridges and swales and tree planting), Intermediate 1 (ridges and swales, tree planting, and FSI), Intermediate 2 (ridges and swales, tree planting, FSI, and wetland restoration), Intermediate 3 (scale in between Intermediate 2 and Maximum to determine if net benefits were maximized), and the Maximum. From this final array, the Tentatively Selected Plan (TSP) was selected. The TSP consists of the Maximum alternative, which includes 223 acres of ridges and swales, 434 acres of tree planting (much of which would be on constructed ridges and swales), 1,254 acres of Forest Stand Improvement (FSI), and 163 acres of wetland restoration (**Figure 1**). The TSP is expected to produce 695.16 AAHUs.

TSP Project First Costs (Table 1)

Table 1. Project Design and Construction Cost Estimates (in \$1,000s) (2025 Price Level)

Account	Measure	Project First Cost
01	Lands and Damages	\$0
06	Fish and Wildlife Facilities	\$17,672
30	Planning, Engineering and Design	\$2,757
31	Construction Management	\$1,451
	TOTAL	\$21,881

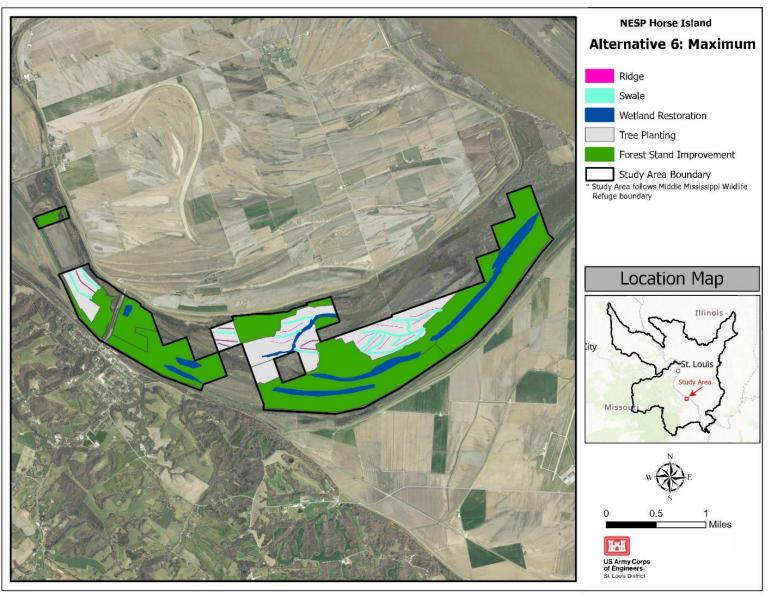


Figure 1. A map of the Maximum Alternative, the Tentatively Selected Plan.

ACRONYMS

 Table 2. A list of common acronyms used in this report.

Average Annual Habitat Unit	AAHU	North American Vertical Datum Of 1988	NAVD88
Area Of Potential Effect	APE	National Environmental Policy Act	NEPA
Cost Effectiveness & Incremental Cost Analyses	CE/ICA	National Register Of Historic Places	NRHP
Cubic Yards	CY	Navigation And Ecosystem Sustainability Program	NESP
St. Louis District	District	Operation And Maintenance	O&M
Dissolved Oxygen	DO	Plans & Specifications	P&S
Engineering Circular	EC	Project Delivery Team	PDT
Essential Habitat Area	ЕНА	Project Implementation Report With Integrated Environmental Assessment	PIR/EA
Environmental Protection Agency	EPA	River Mile	RM
Engineer Regulation	ER	River Resources Action Team	RRAT
Engineering Research And Development Center	ERDC	River Resources Action Team – Technical Section	RRAT- Tech
Endangered Species Act	ESA	River Resources Coordinating Team	RRCT
Fish And Wildlife Coordination Act	FWCA	River Resources Forum	RRF
Fish And Wildlife Interagency Committee	FWIC	State Historic Preservation Office	SHPO
Fish And Wildlife Work Group	FWWG	Ton	TN
Hydrologic Engineering Center- Ecosystem Functions Model	HEC-EFM	Forest Stand Improvement	FSI
Habitat Evaluation Procedures	HEP	Tentatively Selected Plan	TSP
Habitat Needs Assessment-li	HNA-II	Total Suspended Solids	TSS
Habitat Rehabilitation And Enhancement Project	HREP	Upper Mississippi River	UMR
Habitat Suitability Index	HSI	Upper Mississippi River And Illinois Waterway	UMR- IWW
Hazardous, Toxic, And Radioactive Waste	HTRW	Upper Mississippi River Restoration	UMRR
Migratory Bird Treaty Act	MBTA	Upper Mississippi River System	UMRS
USACE, Mississippi Valley Division	MVD	U.S. Fish And Wildlife Service	USFWS
Finding Of No Significant Impact	FONSI	Water Resources Development Act	WRDA
U.S. Army Corps Of Engineers	USACE	Assistant Secretary Of The Army (Civil Works)	ASA(CW)
Upper Mississippi River Restoration Long Term Resource Monitoring Program	UMRR- LTRM	Integrated Feasibility Report and Environmental Impact Statement	IFR/EIS
White-Nose Syndrome	WNS	Public Law	PL
Ordinary High Water Mark	OHWM	Plans & Specifications	P&S
Illinois Department Of Natural Resources	IDNR	Missouri Department Of Conservation	MDC
General Land Office	GLO	Mississippi River Commission	MRC
National Wildlife Refuge	NWR	Conceptual Ecological Models	CEM
U.S. Geological Survey	USGS	Executive Order	EO
Fish And Wildlife Coordination Act	FWCA	Habitat Management Plan	HMP

National Economic Restoration	NER	Environmental Quality	EQ
Regional Economic Development	RED	Other Social Effects	OSE
Principles And Guidelines	P&G	National Economic Development	NED
Water Quality Standards	WQS	Annual Exceedance Probability	AEP
Operation, Maintenance, Replacement, Repair, And Rehabilitation	OMRR&R	Lands, Easements, Rights-Of-Way, And Relocations, And Dredged Material Placement Area Improvements	LERRD
Light Detection And Ranging	LiDAR	Habitat Units	HUs
Emerald Ash Borer	EAB	Cubic Feet Per Second	cfs
Water Surface Elevation	WSE	Hydrology & Hydraulics	H&H
Decibels	dB	National Wetlands Inventory	NWI
National Ambient Air Quality Standards	NAAQS	Illinois Transportation Archaeological Research Program	ITARP
Particulate Matter	PM	Illinois Environmental Protection Agency	ILEPA
Illinois Administrative Code	IAC	Preconstruction Engineering Design	PED
Environmental Site Assessment	ESA	Information For Planning And Conservation	IPaC
American Society For Testing And Materials	ASTM	Archaeological Resources Protection Act	ARPA
Native American Graves Protection and Repatriation Act	NAGPRA	Bald And Golden Eagle Protection Act	BGEPA
Least Environmentally Damaging Practicable	LEDPA	Migratory Bird Treaty Act	МВТА
Range Of Contaminants	RECs	Council on Environmental Quality	CEQ
Environmental Assessment	EA	Future Without Project	FWOP
U.S. Code	U.S.C	Not Likely To Adversely Affect	NLAA
Ridge And Swale	R&S	Operation And Maintenance	O&M
Illinois Natural Area Inventory	INAI	Interest During Construction	IDC
Programmatic Agreement	PA	Code Of Federal Regulations	CFR
Institute for Water Resources	IWR	Environmental Operating Principles	EOP
Clean Water Act	CWA	Implementation Guidance	IG
Locally Preferred Plan	LPP	National Historic Preservation Act	NHPA
Regional Economic System	RECONS	Rivers, Lake, And Streams Act	RLSA
United States Environmental Protection Agency	USEPA		

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM PROJECT IMPLEMENTATION REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

HORSE ISLAND ECOSYSTEM RESTORATION PROJECT

OPEN RIVER, MIDDLE MISSISSIPPI RIVER MILES RM 113-111 RANDOPLPH COUNTY, IL

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1. INTRODUCTION

The U.S. Army Corps of Engineers (USACE) St. Louis District (District) has prepared this Project Implementation Report (PIR) with Integrated Environmental Assessment (PIR/EA) to present a detailed account of the planning, engineering, construction considerations, and environmental considerations that resulted in a Tentatively Selected Plan (TSP) for the Horse Island Ecosystem Restoration Project. The PIR/EA also meets applicable USACE guidance and documents and evaluates environmental effects of the recommended plan and alternatives in compliance with the National Environmental Policy Act (NEPA).

1.1 Authority

The Navigation and Ecosystem Sustainability Program (NESP) is a dual-purpose navigation and ecosystem restoration program for the Upper Mississippi River and Illinois Waterway (UMR-IWW) System authorized by Title VIII (Sections 8001-8005) of the Water Resources Development Act (WRDA) of 2007 (Public Law (PL) 110-114, 33 USC 652 statutory note), substantially in accordance with the Report of the Chief of Engineers dated 15 December 2004 (Chief's Report). NESP is a regional program that includes geographic areas within the boundaries of the USACE - St. Paul, Rock Island, and St. Louis Districts. The navigation portion of the NESP includes both small- and large-scale navigation improvements and mitigation. The ecosystem restoration portion of the NESP includes large projects at specific locations and a programmatic authorization for projects with a total single project cost not to exceed \$25 million. Under the ecosystem restoration portion of NESP, a project will be implemented at 100 percent Federal expense if it (i) is located below the ordinary high water mark (OHWM) or in a connected backwater; (ii) modifies the operation of structures for navigation; or (iii) is located on federally owned land. All other ecosystem restoration projects under the NESP are implemented with cost sharing of 65 percent Federal, 35 percent non-federal (PL 110-114, Section 8004(b)(3)).

1.2 NEPA Tiering

The Chief's Report, supported by the Integrated Feasibility Report and Programmatic Environmental Impact Statement for the Upper Mississippi River and Illinois Waterway System Navigation Feasibility Study (USACE, 2004) (2004 IFR/EIS), describes the framework for the ecosystem restoration component of NESP, including establishing the Federal interest, establishing the justified scope of the plan, and identifying preliminary locations of projects. The remaining requirement for implementation on a project-specific basis is detailed formulation and description of recommended project plans. Pursuant to implementation guidance for the NESP issued by the Assistant Secretary of the Army (Civil Works) (ASA(CW)) dated 2 July 2008, the site-specific assessments are accomplished by preparation of PIRs. The 2008 implementation guidance identifies the specific items to be included in each PIR. This PIR/EA is intended to fulfill those requirements.

The 2004 IFR/EIS includes the purpose, need, plan formulation, benefits, and effects of the NESP in compliance with NEPA. For the ecosystem restoration program, the 2004 IFR/EIS provided analyses at a program level. The conditions and environmental effects described in the 2004 IFR/EIS are still valid to support the ecosystem restoration project evaluated in this PIR/EA. This PIR/EA provides project-specific analysis of the proposed project and alternatives as a tiered NEPA document consistent with 40 CFR 1501.11 and 1508.1(ff). When the analysis presented in the 2004 IFR/EIS is adequate, no additional analysis is provided and instead the 2004 IFR is incorporated by reference.

1.3 NESP Partnership

Participants in the planning of the Project included St. Louis District and Regional Planning and Environment Division North staff, U.S. Fish and Wildlife Service (USFWS), and Project partners. Under Federal regulations governing the implementation of NEPA, USFWS is a cooperating agency. Development of this PIR/EA was actively coordinated with the participants during team meetings, phone conversations, and on-site visits to the Project area. This PIR/EA summarizes the multidisciplinary efforts of the Project Delivery Team (PDT), which includes the District, the Sponsor, and Project partners. The Corps also consulted with Tribal Nations.

U.S. Army Corps of Engineers, St. Louis District. The District is responsible for Project management and coordination with the Sponsor, Project partners, and other affected agencies. The District will submit the PIR/EA, program funds, finalize Plans & Specifications (P&S), complete all NEPA requirements, advertise and award a construction contract, and perform construction contract supervision and administration.

Sponsor. USFWS is the Sponsor, the landowner, and would be responsible for O&M.

Partners. The Illinois Department of Natural Resources (IDNR), Missouri Department of Conservation (MDC), and River Resources Action Team (RRAT) are partners. The RRAT is an interagency committee that provides an effective forum to address natural resource issues in the Mississippi River within the District. Members of the RRAT include natural resource managers with the U.S. Fish and Wildlife Service (USFWS), IDNR, and MDC.

1.4 Purpose and Need for Federal Action

The goal of the NESP is to ensure an efficient and environmentally sustainable navigation system on the UMR-IWW system. The 2004 IFR/EIS (Chapter 1) established the purpose and need for the ecosystem restoration plan, which remain valid. Section 8004(b)(1) of WRDA 2007 directs the Secretary to "carry out, consistent with requirements to avoid adverse effects on navigation, ecosystem restoration projects to attain and maintain the sustainability of the ecosystem of the Upper Mississippi River and Illinois River in accordance with the general framework" outlined in the Chief's Report. Each PIR identifies a project-specific purpose and need, consistent with the 2004 IFR/EIS and WRDA 2007.

Within the overarching NESP purpose, the purpose¹ of the project proposed in this PIR is floodplain restoration, including attaining and maintaining the sustainability of floodplain forest and wetland habitat in the Horse Island study area within the Middle Mississippi River National Wildlife Refuge (NWR; Refuge). The need for restoration actions within the study area is based on the following factors:

- The presence of invasive species;
- Reduced native species richness and diversity;
- Low native tree regeneration;
- Reduced forest structural diversity;
- Reduced health and diversity of wetland habitats; and
- Lack of topographical diversity that was once characteristic to the floodplain before changes in land use.

¹ Additional information on site-specific problems and study objectives are described fully in Chapter 2.

1.5 Study Area

Horse Island is one of seven divisions of the Middle Mississippi Wildlife Refuge (RM 155-RM 89), which currently encompasses approximately 8,224 acres of the Middle Mississippi Reach (Middle Mississippi, MMR). This corridor stretches 195 miles of the Mississippi River (RM 195-RM 0), from the confluence of the Missouri River near St. Louis, MO to the confluence of the Ohio River at Cairo, IL. The Refuge was established in 2001 as part of the larger National Wildlife Refuge System mission to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Unlike the Upper Mississippi River System (UMRS), the Middle Mississippi is considered "Open River" and is not impounded, though the USACE still maintains a 9-foot navigation channel supported by dredging and river training structures. The MMR also has extensive levees which extend much further than in the UMRS, and over 75% of the MMR floodplain area is now behind mainstem levees (Theiling et al. 2000).

The Horse Island Division is located near Kaskaskia, Illinois [River Mile (RM) 113-111] on Kaskaskia Island. **Figure 2Error! Reference source not found.** shows the vicinity of the study area, with the study area outlined in dark yellow. While it lies west of the Mississippi River, Horse Island is within Illinois rather than Missouri; the state boundary was designated when the main river channel flowed to the west of the study area. Lands in the study area are within the Refuge boundary and are owned by USFWS; there are also privately owned inholdings. Land in privately owned inholdings were excluded from the study area and were not considered in plan formulation.

The study area comprises a total of 2,052 acres, and consists of point bar (floodplain forest, riverfront forest, scrub-shrub, and old field habitats) and backswamp (swamp shrubland and open water habitats) features on the riverside of the levees. Point bars are formed on the inside bend of a river as a river slows and sediment is deposited. They exhibit lateral ridges, created by the buildup of silt and sand, and a cut swale on the outside bank. Overtime, the river will form a series of lateral ridges and swales, as exhibited on Horse Island. Current land cover is approximately 20% non-forested abandoned agricultural fields and 80% forest communities. The primary habitat type of the study area is bottomland forest, further classified as riverfront forest and floodplain forest. The dominant community types are willow, maple-ash-elm, and swamp-shrubland. There are some stands with higher elevation mixed forest that includes mature and regenerating pecan. The second most dominant land cover is old field. This is present on the majority of abandoned agricultural fields, with weedy and invasive annual species dominating the vegetation cover. Some areas are also mixed with scrub-shrub habitat and patches of early successional regeneration. Wetlands are not very diverse, with most having little to no herbaceous diversity, and the dominant habitat type being swamp-shrubland. More information about the current terrestrial habitat is detailed in Section 3.

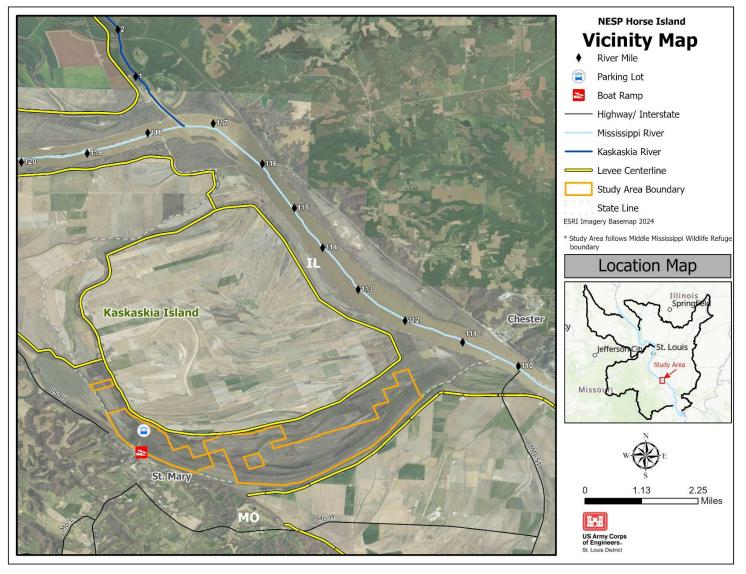


Figure 2. Vicinity of the study area

1.5.1 History of the Study Area

The earliest descriptions of the study area are from surveys conducted by the General Land Office (GLO) in 1810. At this time, the study area was very different from its current landform and boundaries. The main channel of the Mississippi River flowed west of Kaskaskia Island and the point bar feature that would be encompassed into present-day Horse Island had not yet developed, instead being noted as a series of smaller islands at the meander of the river. The GLO notes describe the timber along the banks of the Kaskaskia and Mississippi Rivers in this area as composed of Maple, Cottonwood, Boxelder, as well as rich bottom timber of Oak, Ash, Elm, Hackberry, Hickory, and undergrowth of Pawpaw, Oak, Hickory, grapevines, and greenbriar. The rich bottoms are sometimes noted at foothills, an indication of the ridge and swale topography of the floodplain. These descriptions would have been representative of much of the bottomland forest along the Middle Mississippi Reach. Although the notes do not include descriptions of the islands, historical maps from later surveys show them as forested and it can be assumed that the species composition was similar to the bottomland timber of the banks.

The Great Flood of 1881 destroyed most of the town of Kaskaskia (at one point, the state capital of Illinois) and the main channel of the Mississippi River changed course to the east of the island, capturing a reach of the Kaskaskia River. Following the diversion of the river, there was significant deposition occurring in the old channel due to the slower flows depositing more sediment, particularly at the meander of the channel where it flowed into the Kaskaskia River, slowly forming the point bar that is now the Horse Island Division. In the late 1880s and early 1900s, the Mississippi River Commission (MRC) conducted an extensive high-resolution survey of the Mississippi River from Minneapolis, MN to Cairo, IL. These surveys indicate that, by the 1890s, the point bar had developed significantly, with sandbars forming and connecting t the islands and mainland. Land cover within the Horse Island study area based on these surveys was classified as 40% sand bar, 43% water (including the channel and interior ponds) and 17% floodplain forest. Topography in the area had a 5-10 ft difference between the higher ridges and lower swales, with interior ponds having formed at the lowest elevations. Dominant species noted include Cottonwood and Willow, which would have compromised the early successional forest community forming on the sandbars as they vegetated. The higher elevation forested lands were more diverse since they were older bottomland forest on the islands prior to the deposition in the old river channel.

Around this same time in the early 1900s, there was an increase in channelization and flood control efforts in the MMR through the construction of river training structures, levees, and dredging. Dikes and other channel training structures were built to support the maintenance of the 9-foot navigation channel. These structures control water flow and sedimentation to increase and maintain channel depth. Over time, they caused increased sedimentation of side channels and backwaters, and the width of the River, its braided backwater characteristics, and area of islands began to decrease. Average width of the river declined from 5,026 feet in 1817 to 2,974 feet in 2003 (Brauer et al. 2005). This decreased the extent of the floodplain and filled in backwaters over time, which impacts flooding and inundation on forest resources as water has less area to spread out in the floodplain during high water events. In the early 1900s, levee construction also expanded significantly to protect urban and agricultural areas from flooding. The Kaskaskia Island levee was built to the north of the study area in the 1910s and Bois Brule levee to the south of the study area on the other side of the old river channel in 1968. Levee construction expanded not just in coverage, but also in height. In St. Louis, levees that were

originally built to protect the city to 11-12 feet above stage and by 1960 increase to about 21 feet above flood stage. Over 75% of the MMR floodplain area is now behind mainstem levees (Theiling et al. 2000). This has cut-off the river from its natural floodplain, which impacts the natural flooding regime since water is unable to spread over the larger floodplain, restricting where it can flow, leading to increased flooding severity. This has further degraded forest resources in the reach due to stress of increased inundation.

By 1940, the point bar had developed to its present-day boundaries and had vegetated. Survey maps indicate that the majority of the study area was forested, with agriculture taking place on the higher elevation areas. Agriculture developed throughout the Mississippi River floodplain during the early 1900s, and the fields within the unit were actively farmed until the 1990s. In the overall reach, over 75% of original forest cover has been converted to agriculture (Theiling et. al. 2000). Land conversion to agriculture on Horse Island was concentrated on the higher elevation areas, which leveled these stands and reduced topographic variability. These changes in microtopography are difficult to capture in LiDAR, but Figure 4 highlights the difference in the topography variability between the levee protected areas north of the study area versus the study area itself. Some of this loss of topography is also in lower elevation areas due to changes in hydrology and sedimentation in the floodplain across the MMR from the construction of control structures and levees. By 1975. Horse Island study area was classified as 47% floodplain forest, 26% agriculture, 16% populus (cottonwood) community, 5% wet meadow, 2% marsh, and 1 % salix (willow) community. These land classifications were developed by the USACE's Upper Mississippi River Restoration (UMRR) Long Term Resource Monitoring (LTRM) program. This land was still being actively farmed at this time. Forest cover in the study area increased significantly as the land accreted through sedimentation vegetated over the past 125 vears. Mature mixed forest remained on the higher elevation stands, where there is still currently mature pecan present.

According to 2011 land cover data, the natural habitats in the study area were classified as 61% wet forest (floodplain forest, salix community, and populus community), 26% shallow marsh, 3% wet shrub, and 1% roadside grasses/levees. The areas identified as shallow marsh were fallow agricultural fields that are now dominated by weedy species, scrub-shrub habitat, and patches of young early successional forest of cottonwood and willow. The agricultural fields were abandoned in the 1990s, and most remain unvegetated due to the dense cover of weedy and invasive vegetation and scrub-shrub habitat as well as the increased frequency and duration of flooding. USFWS acquired the study area lands for the Refuge in 2006 when it was donated to the agency by the American Land Conservancy. Since its acquisition, management has been limited to small-scale tree plantings and most of the study area has not been actively managed by USFWS.

The current land cover is very similar to the data described in 2011. The fallow fields remain primarily unforested, and there has been a significant increase in invasive species in canopy gaps in the forested stands. Forest habitats have lost structural diversity from the lack of natural regeneration of native trees and stress from increased inundation, which has caused tree mortality, especially of seedling and saplings. Regeneration has been further suppressed by invasive and aggressive species, which have colonized gaps and prevented natural forest succession. More information about the current terrestrial habitat is detailed in Section 3.

1.6 Prior Reports, Existing Water Projects, and Ongoing Programs

The following table summarizes prior reports, existing water projects, and ongoing programs which provided valuable information, experience, or guidance in the planning of the Project (**Table 3**). Additional literature cited can be found at the end of each Appendix.

Table 3. Prior Reports, Projects, and Programs

Project Year	Study/Report/Environmental Document Title	Project Relevance
1995	Upper Mississippi River System Environmental Management Program Definite Project Report/Environmental Assessment, Mississippi River Bank Stabilization HREP Pools 5-10	Design elements
2002	Upper Mississippi and Illinois River Floodplain Forests: Desired Future and Recommended Actions. 2002.	Highlights the ecological importance of floodplain forests in the Upper Mississippi River and provides management recommendations to achieve desired future conditions for those forests.
2004	Final Integrated Feasibility Report and Programmatic Environmental Impact Statement for the UMR-IWW System Navigation Feasibility	Basis for NESP authorization in WRDA 2007
2004	Chief's Report UMR-IWW System Navigation Feasibility Study	Basis for NESP authorization in WRDA 2007
2008	Status and Trends of Selected Resources of the Upper Mississippi River System. U.S. Geological Survey, Upper Midwest Environmental Sciences Center	Ecosystem goals and indicators and status and trends of biological, physical, and chemical indicators of system health developed through UMRR-LTRM
2008	An Evaluation of Ecosystem Restoration Options for the Middle Mississippi River Regional Corridor	Provides guidance for ecosystem restoration efforts in the study area
2012	Upper Mississippi River Systemic Forest Stewardship Plan.	Guide for the sustainable management of the Upper Mississippi River System (UMRS) forests
2012	Upper Mississippi River Environmental Design Handbook	Design elements
2025	Habitat Management Plan for the Refuge [currently awaiting final approval; Refuge shared draft version with PDT]	Management plan including habitat goals for the Refuge
2008	An Evaluation of Ecosystem Restoration Options for the Middle Mississippi River Regional Corridor	Provides guidance for ecosystem restoration efforts in the study area

2 NEED FOR AND OBJECTIVES OF ACTION

This chapter describes the development of Project objectives, including the identification of problems and opportunities, assessment of resource significance of the Project area, consideration of the goals and recommendations of overarching programs, and identification of constraints and considerations. For planning purposes, the period of analysis was established as 50 years starting in 2028.

2.1 Specific Problems and Opportunities

The problems and opportunities for the NESP are described in the 2004 IFR/EIS, Chapters 1. Purpose and Need for Action and 4. Inventory and Forecast Resource Conditions. As described in the 2004 IFR/EIS, floodplain habitats are integral components of large river ecosystems because of the seasonal flood pulse that inundates them and connects them to the river. Many species of plants and animals are adapted to this flood cycle and take advantage of habitat and food resources as they are made available. Many important sediment and nutrient transfers also occur when floodplains are inundated. In the Middle Mississippi river reaches, the floodplain is much more developed for crop production and flood protection and is thus much more isolated from the river. Floodplain restoration in southern reaches includes restoration of floodplain forest, island, backwater, and side channel habitat.

Problem Statement. Between RM 113-111 on the open river, native floodplain forest communities have severely declined in extent, percentage of forest cover, diversity (community, structure, and species diversity), habitat health, and resiliency due to changes in hydrology and hydraulics from implementation and operation of the 9-foot navigation channel, land use changes, the spread of invasive species, and weather related variations. The degraded forest communities provide reduced habitat suitability and resources for wildlife such as migratory and nesting neotropical birds such as prothonotary warblers (Protonotaria citrea).

Problems. Problems in the study area include:

- 1. Forest: Native floodplain forest communities have severely declined in extent, diversity (community, structure, and species), and health due to changes in land cover, introduction of invasive species, altered hydrology and hydraulics of the Mississippi River from implementation and operation of the 9-foot navigation channel, and changing hydrologic conditions.
 - Altered flooding regimes and frequency along with environmental variation has increased tree stress and morality, disrupted natural forest regeneration, increased the spread of invasive species, and reduced the resiliency of forest communities
 - Invasive and aggressive species have increased tree mortality and have colonized forest gaps, suppressing regeneration of native trees and vegetation.
 - Forest diversity (community, structure, and species) has declined throughout the reach, particularly bottomland hard mast, and has been further impacted by loss of topographic variation due to changing hydrology and land-use.
 - Fragmentation, land-use change, and loss of forest cover has reduced habitat suitability for wildlife, has degraded overall forest health and diversity, and has decreased connectivity in the floodplain corridor
 - The degraded forest communities provide reduced habitat suitability for forestdependent wildlife.
- 2. Topography & natural hydrologic processes: Sedimentation, increased flooding, low

topographical variation, and land use changes have resulted in the loss of floodplain topographic diversity and aquatic habitat.

- The loss of topographic diversity has in turn led to loss of vegetative community diversity and reduced extent of elevation suitable for bottomland hard mast within the study area. Lack of topographic variation, particularly of higher elevation ridges, has decreased resiliency of forest habitat to changing flooding regimes, prolonged inundation, and long term weather variability.
- 3. Wetlands: Loss of aquatic, emergent, and backswamp vegetation has degraded the quality of wetland habitat for aquatic and terrestrial species, decreased the potential to retain sediment, and reduced water quality.
 - Loss of wetlands and backswamp habitat means diminished food sources, shelter, cover, and important nesting habitat for migratory birds, waterfowl, and wading birds, as well as mammals, reptiles, and amphibians in the wetlands.

Opportunities. Opportunities for this project include:

- There is an opportunity to improve the resiliency of the study area habitat to the effects of hydrologic variability.
- There is an opportunity to contribute to the management goals of the Middle Mississippi River NWR.
- There are opportunities to optimize hydrologic connectivity between the floodplain and the Mississippi River.
- There is an opportunity to trial innovative restoration techniques using an adaptive management approach to benefit the restoration success of future ecosystem restoration projects under the NESP.
- There is an opportunity to improve passive recreational activities (hiking and birdwatching) in the study area.

2.2 Conceptual Model(s)

Conceptual ecological models (CEM) are helpful planning tools used to identify the major drivers and stressors on natural systems, the ecological effects of these stressors, and the best biological attributes or indicators of these ecological responses (Rudnick et. al., 2005). By describing general relationships among ecosystem components, these models allow teams to tell the story of how complex systems work in a more simplified and easily understood way.

The U.S. Geological Survey (USGS) and USACE, in cooperation with partners, have developed CEMs that describe the UMRS as four interacting sub-systems (flowing channels (lotic), still-water backwaters, floodplain lakes (lentic), and floodplain)) (Bouska, 2018). The PDT developed a CEM based on the four Bouska CEMs to identify the major problems, develop objectives addressing those problems, and identify any additional opportunities for restoration within the study area (**Figure 3**). This model is useful to understand the major ecological resources of the UMR generally with the controlling variables that govern those resources.

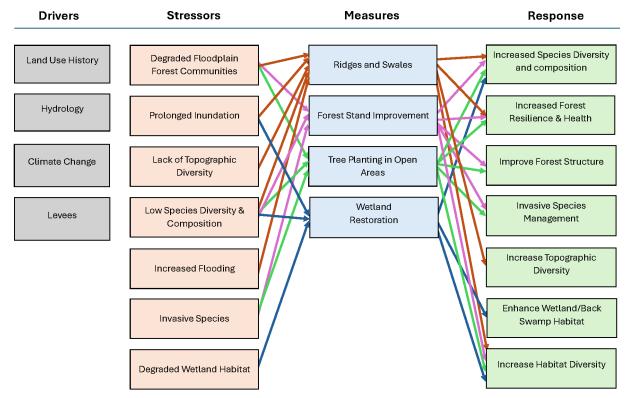


Figure 3. Conceptual Ecological Model (CEM)

The major resources of the floodplain subsystem include water quality, vegetation community, and avian communities, which are known to be strongly influenced by flood inundation regimes, soils, and invasive species.

2.3 Resource Significance

Resource significance of the UMR is fully described in the Chief's Report and 2004 IFR/EIS, (Chapter 1). Site-specific resource significance, where relevant, is described below (**Table 4**).

1. Institutional Recognition: Institutional recognition means the importance of an environmental resource is acknowledged in the laws, adopted plans and other policy statements of public agencies, tribes, or private groups.

Congress designated the UMRS as both a "...nationally significant ecosystem and a nationally significant navigation system..." in Section 1103 of the WRDA 1986. Institutional significance of the UMRS is demonstrated in a number of region-specific laws and policies including the UMR National Wildlife and Fish Refuge Comprehensive Conservation Plan of 2006, the UMR Wildlife and Fish Refuge Act of 1924, and the Migratory Bird Conservation Act of 1929.

The Middle Mississippi River NWR is covered by the Mark Twain NWR Comprehensive Conservation Plan and Environmental Assessment from 2004.

2. Technical Recognition: Technical recognition means the resource qualifies as significant based on scientific knowledge or judgment of critical resource characteristics. Scarcity, representativeness, status and trends, connectivity, limiting habitat, and biodiversity

describe technical significance. Differences across geographical areas and spatial scales may determine whether a resource is significant.

The Horse Island Division represents a unique opportunity to improve floodplain habitat in the Middle Mississippi Reach because of the limited federal land available for floodplain forest restoration, especially in contiguous forest patches. Over 75% of original forest cover in this reach has been converted to agriculture (Theiling, et al., 2000). Additionally, management of the navigation channel through construction of river training structures, along with the extensive levee system in the MMR, has degraded existing island and floodplain habitat. The establishment of the Middle Mississippi National Wildlife Refuge was prompted by the loss of habitat, and this project aligns with Refuge goals to improve existing floodplain, backwater, and wetland habitat and provide an increased diversity of forest communities. Furthermore, the study area has suitable land for ridge and swale construction, which can support the restoration of bottomland hard mast forest. This is a priority forest community type for this reach since there is limited elevation suitable for establishing hard mast across the MMR, especially as the construction of levees and water control structures in combination with environmental change continue to impact flood frequency, duration, and severity. The unforested agricultural fields and the existing accessibility to these sites present a valuable opportunity to create higher elevation suitable for bottomland hard mast reforestation and to utilize adaptive tree planting to establish more diverse and resilient forest communities.

The Refuge itself totals approximately 8,215 acres across seven divisions. Horse Island represents approximately 2,000 acres of the Refuge.* The study area also contains the Illinois state champion pecan tree, last measured in 2014. State champion trees are registered as the largest of their species within the state. This champion tree is 108 feet tall with a 116-foot spread and a circumference of 18.1 feet.

In the Horse Island study area, the floodplain forests provide summer roosting and general foraging habitat for forest bat species and migration stopover habitat for numerous neotropical migrant birds and waterfowl. There are numerous year-round residents and breeding bird species as well, including the bald eagle. The forests and old fields provide habitat and food, including nectar sources for pollinating insects. An in-depth discussion of available habitats and wildlife present on Horse Island can be found in Sections 3.1.10, 3.1.11, and 3.1.12.

3. Public Significance: Public recognition means some segment of the public recognizes the importance of an environmental resource, as evidenced by people engaged in activities reflecting an interest or concern for that resource.

The Horse Island site is significant to the public in that it provides many wildlife-dependent recreational activities including bird watching, wildlife photography, fishing, and several types of hunting opportunities according to State seasons and regulations. Hiking is also allowed, as is mushroom and berry picking for personal consumption. During the appropriate seasons, these activities are an addition to the livelihood of the local landowners around the study area.

 Table 4. Resource Significance of UMR.

Resource	Institutional	Public	Technical
Threatened and Endangered Species	Fish and Wildlife Coordination Act (FWCA), as amended (16 U.S.C.§ 661) Endangered Species Act (ESA) of 1973, as amended. National Wildlife Refuge Systems Biological Integrity, Diversity, and Environmental Health Policy	Congress has recognized the Nation's rich natural heritage is of "esthetic, ecological, educational, recreational, and scientific value to our Nation and its people."	Representativeness: USFWS has identified the gray bat; Indiana bat; northern long-eared bat; and pallid sturgeon as federally endangered or threatened species that have the potential to occur within the study area. The tricolored bat is proposed for listing, and also has the potential to occur within the study area; as does the Monarch Butterfly, a candidate species.
Migratory Birds	Migratory Bird Conservation Act of 1929, and associated treaties Migratory Bird Treaty Act (MBTA) of 1918 EO 13186 — Responsibilities of Federal Agencies to Protect Migratory Birds Bald and Golden Eagle Protection Act of 1940 North American Waterfowl Management Plan	Migratory birds provide the public with recreational opportunities, such as bird watching and waterfowl hunting. National Audubon's Mississippi River Campaign has been working to raise awareness of the importance of the Mississippi River as an internationally significant resource since 1998. The Upper Mississippi River Waterfowl Conservation Region (Region 19) is a level III Ducks Unlimited conservation priority area, providing a migration corridor for hundreds of thousands of dabbling ducks and significant numbers of divers.	Representativeness: Numerous migratory birds utilize the study area; the following as the most relevant in the area: Bald Eagle, Great Blue Heron, waterfowl, and neotropical migratory birds. Representativeness: Knutson et al. (1998) found relative abundances of all birds and total numbers of neotropical migratory birds were almost twice as high in the UMR floodplain as in the adjacent uplands. Status and Trend: Changes in the UMR forest community have contributed to a reduction in diversity of habitat over time. These trends are likely to continue, and without intervention, the study area will cease to provide migration, dispersal, breeding, nesting, and cover habitat for a wide range of migratory birds.
Floodplain Forests	Fish and Wildlife Coordination Act, as amended (16 U.S.C.§	The Upper Mississippi River Conservation Committee recognized	Representativeness: The study area contains floodplain forest habitat.
	661)	the importance of the floodplain forest to the	
	ESA of 1973, as	fish and wildlife of the	Biodiversity: The largest concern is that, without intervention, the

Resource	Institutional	Public	Technical
	amended National Wildlife Refuge Systems Biological Integrity, Diversity, and Environmental Health Policy	UMR in the report, Upper Mississippi and IL River Floodplain Forests (Urich et al., 2002).	study area is likely to continue to experience forest fragmentation and limited species and structural diversity. Consequently, neotropical and other migratory birds, forest-dependent bat species, and the other floodplain species that rely on the forest resources will be severely impacted. (Knutson, 1996) described the importance of floodplain forest in
			the conservation and management of neotropical migratory birds.
Wetlands	Executive Order No. 11990 of May 1977 (Protection of Wetlands) Water Resources Development Act of 1990, Section 307(a) National Wildlife Refuge Systems Biological Integrity, Diversity, and Environmental Health	Protecting wetlands from excessive pollution and destruction is a Mississippi River Collaborative (MRC) priority. MRC has established a Wetlands Group to address this specific issue.	Scarcity: In the United States, over a period of 200 years between the 1780s and the 1980s, the lower 48 states have lost an estimated 53% of the 221 million acres of original wetlands. Scarcity: Through land use changes, approximately 90% of pre-settlement wetlands in Illinois were lost by the 1980s.

2.4 Goals and Recommendations of Overarching Programs

2.4.1 **NESP Program Objectives**

The primary goal of the NESP, as an integrated dual-purpose plan, is to ensure the economic and environmental sustainability of the UMR-IWW Navigation System.

Included in the 2004 IFR/EIS' recommended plan are actions for cultural resources preservation and mitigation as well as bank stabilization (including bankline protection).

As stated in the 2008 NESP Implementation Guidance, "[t]he ecosystem restoration plan authorized in Title VIII of WRDA 2007 is the initial increment of a framework plan developed by identifying broad ecosystem goals to meet the planning objective of restoring the ecosystem of the UMR-IWW including addressing the cumulative impacts and ongoing effects of the navigation" system. These broad goals were further refined into systemic goals and site specific objectives..."

2.4.2 Habitat Needs Assessment-II.

A suite of 12 indicators were developed in the Habitat Needs Assessment-II (HNA-II) to quantify aspects of ecosystem health and resilience, reflect the ability of large floodplain river ecosystems to adapt and respond to disturbances, and represent ecosystem-based management objectives developed for the UMRS (USACE, 2011). To identify habitat needs for

the UMRS, the HNA-II effort compared individual indicators to the conditions desired by the management agencies on the UMRS. An assessment of current conditions using both quantitative data analysis and qualitative management perspectives was performed at two spatial scales: navigation pool and clusters of navigation pools that shared similar ecological attributes. The information provided in the HNA-II can be useful in planning and implementing individual ecosystem restoration projects (McCain, K.N.S., et. al., 2018). Open River desired future conditions in the HNA-II include:

- Restore function and diversity of aquatic habitat types by improving quality, depth and distribution of lotic and lentic habitats
- Restore floodplain topographic diversity (including ridge and swale) and diversify inundation periods to mimic pre-dam conditions
- Restore, maintain and enhance floodplain vegetation diversity, including hard-mast (nutproducing) trees

The unimpounded section of the Middle Mississippi River is part of the Open River Cluster and has the desired future condition of maintaining existing ecosystem conditions in the face of future disturbances, stressors, and existing rates of ecosystem degradation, as well as developing partnerships with other organizations operating at a broader scale. Specific ecosystem restoration objectives for the Upper Mississippi River System Impounded Reach were outlined in the Upper Mississippi River System Ecosystem Restoration Objectives 2009, Appendix C: Unimpounded Middle Mississippi Reach Plan. The following objectives from this Appendix will be addressed:

- Habitat: Manage for a diverse and dynamic pattern of habitat to support native biota
 - Restore, expand, and maintain the amount and diversity of floodplain terrestrial habitats emphasizing contiguous patches of plant communities to provide a corridor along the UMR and riparian buffers.
 - Restore habitat types most reduced from their pre-settlement extent (e.g., Bottomland and mesic prairies, Savanna, Floodplain Lake, Floodplain Forest, and Bottomland Hardwoods) and the ecological processes and functions to support them.
 - Protect, restore and manage complex wetland areas (including within leveed areas) to provide diverse habitat
- Biota: Manage for viable populations of native species within diverse plant and animal communities
 - Maintain and restore viable populations of native species and communities throughout their range in the UMRS in suitable geomorphic areas of the landscapes.
 - Reduce the adverse effects of invasive species on native biota.
 - o Provide nesting, feeding and resting habitat for migratory birds.

2.4.2 Sponsor Management Goals

USFWS's Management Goals for the Refuge (from the Final Land Protection Plan and Environmental Assessment for Middle Mississippi River National Wildlife Refuge Boundary Expansion; completed and signed in June 2023) are:

• Protect forested riverine habitat and healthy forests across wide stretches of the floodplain that contain sufficient diversity of tree species, size, and age to provide diverse habitat structure and food resources.

- Restore and enhance floodplain forest to meet the need of migratory and nesting neotropical birds and other forest-dependent wildlife.
- Restore or enhance riparian corridors along the open river off-channel areas.
- Protect existing wetland resources to provide diverse habitat for waterfowl, shorebirds, wading birds, and other wetland dependent species.
- Increase resource compatible recreation opportunities on public lands.

At a planning charrette for this study held in November 2023, USFWS noted that the Habitat Management Plan (HMP) for the Refuge, which is currently in draft status and expected to be approved in 2025, has related habitat objectives that are derived from the Refuge's Comprehensive Conservation Plan. The HMP objectives include metrics for forest block size (>250 acres) and overstory canopy cover (>70%). The HMP objectives will be evaluated and incorporated into the project objectives in coordination with USFWS.

2.5 Project Objectives

Economic, social, and environmental benefits, impacts, and costs are to be identified, measured, and/or qualitatively characterized using four accounts (ER 1105-2-103, Policy Memorandum Comprehensive Documentation of Benefits in Decision Document 5 January 2021). The National Economic Restoration (NER) plan documents increases (or decreases) in the net quantity and/or quality of desired ecosystem resources. The environmental quality (EQ) account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of aquatic ecosystem restoration plans. The regional economic development (RED) account displays changes in the distribution of regional economic activity (for example, income and employment). The Other Social Effects (OSE) account displays plan effects on social aspects such as community resilience, public health, life safety, displacement, energy conservation, and similar effects. Taken together, the concepts behind the four Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) accounts contribute to a structured planning framework for evaluating and comparing alternatives.

NESP's dual-purpose (navigation and ecosystem) plan aims to ensure the economic and environmental sustainability of the UMR-IWW Navigation System to ensure it continues to be a nationally treasured ecological resource as well as an efficient national transportation system as designated by Congress in the 1986 Water Resources Development Act (Public Law 99-662). As stated in the 2007 NESP Authorization, the goal of the NESP ecosystem restoration project as a whole is "[t]o ensure the environmental sustainability of the existing Upper Mississippi River and Illinois Waterway System...to address the cumulative environmental impacts of operation of the system and improve the ecological integrity of the Upper Mississippi River and Illinois River."

The Horse Island NESP Project fits within the larger NESP goal by aiming to maintain, enhance and restore quality habitat for native and desirable plant, animal, and fish species for a resilient and sustainable ecosystem. This PIR evaluates floodplain restoration project. The following objectives were identified within the study area over the 50-year period of analysis:

Primary Objective 1: Restore floodplain forest communities to include sub-objectives:

a. Improve forest health (i.e., natural regeneration), and diversity (species, structural, and community), including for the benefit of bottomland hard mast, riverfront terrace, and floodplain forest communities

- b. Increase the spatial extent and contiguity of forest cover, particularly in old field habitat.
- c. Increase the resilience of floodplain forest habitat to long term weather variability and prolonged inundation.
- d. Reduce presence of invasive species that are inhibiting forest regeneration and establishment of native vegetation.

Primary Objective 2: Restore *topographic variation* supporting forest and wetland communities to include sub-objectives:

- a. Increase occurrence of higher elevation habitats with shorter periods of inundation sufficient for the establishment of hard mast species.
- b. Create persistent depth and habitat diversity of existing swales.
- c. Establish topographic variation that can support a diversity of vegetative communities and wildlife resources across a gradient of elevations.

Secondary Objective*: Restore and enhance the quality and diversity of wetland and backswamp habitat to include sub-objectives:

- a. Restore native wetland and backswamp vegetation diversity and structural complexity.
- b. Restore desirable submergent and emergent vegetation for native resident and migratory wildlife (feeding/nesting).
- c. Restore and enhance backswamp communities.

Objective	Sub Objectives	Rationale
Primary Objective 1: Restore floodplain forest communities	Improve forest health (i.e., natural regeneration), and diversity (species, structural, and community), including for the benefit of bottomland hard mast. Increase the spatial extent and continuity of forest, particularly in old field habitat. Increase the resilience of floodplain forest habitat to long term weather variability and prolonged inundation. Reduce presence of invasive species that are inhibiting forest regeneration and establishment of native vegetation.	manage for viable populations of native species within diverse plant and animal communities
Primary Objective 2: Restore topographic variation supporting forest and wetland communities	Increase occurrence of higher elevation areas with shorter periods of inundation sufficient for the establishment of hard mast species. Create persistent depth and habitat diversity of existing swales. Establish topographic variation that can support a diversity of vegetative communities and wildlife resources across a gradient of elevations.	Addresses MMR objectives to manage for a diverse and dynamic pattern of habitat to support native biota Supports restoration of priority bottomland hard mast species and communities including Oak-Hickory Addresses HNA-II desired future conditions to restore floodplain topographic diversity (including ridge and swale) and diversify inundation periods to mimic pre-dam conditions
Secondary Objective*: Restore and enhance the <i>quality and</i> <i>diversity of wetland</i>	Restore native wetland and backswamp vegetation diversity and structural complexity.	Addresses MMR objectives to protect, restore and manage complex wetland areas (including within leveed areas) to provide diverse habitat

Objective	Sub Objectives	Rationale
and backswamp habitat to include sub- objectives:	Restore desirable submergent and emergent vegetation for native resident and migratory wildlife (feeding/nesting). Restore and enhance backswamp communities.	Addresses Sponsor management goal to protect existing wetland resources to provide diverse habitat for waterfowl, shorebirds, wading birds, and other wetland dependent species.
	buonowamp communico.	Addresses HNA-II desired future conditions to restore function and diversity of aquatic habitat types by improving quality, depth and distribution of lotic and lentic habitats

^{*}Note: The focus of this project is forest diversity. Forested wetlands are already covered under Primary Objective 1. As the project progresses, the study team will assess the potential to restore/enhance wetlands; this objective will be kept for now - but may become an opportunity later on. If retained as a secondary objective, priority will be placed on achieving the primary objectives while considering ways to achieve the secondary objective in a manner that supports and complements the primary objectives. In instances where an alternative only address the secondary objective, it may be screened.

2.6 Study Constraints and Considerations

The following constraints and considerations were included in plan formulation:

Constraints:

- Measures should not increase river water surface elevations or adversely affect private property or infrastructure during a 1% annual exceedance probability (AEP) flood event.
- Measures should not result in adverse effects to the federally authorized UMR-IWW navigation channel.

Considerations:

- Construct measures consistent with Federal, state, and local laws.
- Avoid/minimize the spread and introduction of invasive species associated with potential ecosystem restoration measures.
- Avoid/minimize disproportionate adverse impacts to local communities.
- Avoid/minimize adverse impacts to cultural resources in the project area (if any).
- Avoid/minimize adverse impacts to existing Federal, state, local, or non-government-managed projects, e.g. levees.
- Minimize operation, maintenance, replacement, repair, and rehabilitation (OMRR&R) requirements to support sustainability and resiliency of measures (including resiliency to the impacts of weather related risks and other ecological stressors).
- Avoid/minimize adverse impacts to adjacent landowners.
- Avoid/minimize adverse impacts to recreation.
- Work within the Illinois No-Rise parameters.
- Construction windows should be timed to reduce adverse impacts to spring/fall waterfowl migration and bat roosting sites.

3 EXISTING CONDITIONS AND FUTURE WITHOUT PROJECT CONDITIONS

Both existing and future conditions expected to occur without a project must be characterized to clearly define the problems and opportunities for a study. The future without-project condition (FWOP) forms the basis from which alternative plans are formulated and impacts are assessed. At a broad scale, the existing and FWOP conditions of the UMRS are accurately described within the 2004 IFR/EIS, Chapter 4-Inventory and Forecast Resource Conditions. Information and conditions specifically relevant to the study area are described below.

3.1 Resource History, Existing Condition, Management of the Study Area, and Estimated Future Without Project Conditions

The PDT evaluated relevant resources in the study area and assessed existing and FWOP conditions. Under NEPA, the FWOP (considered to be the No Action alternative) is necessary to provide a reference point, enabling a comparison of environmental effects of the action alternatives. The FWOP condition is the forecasted condition of the project area for the next 50 years assuming that no significant action is taken to address the resource problems identified. The PDT focused its evaluation on resources potentially affected by the alternatives. Each resource in Section 3.1 has been described in its existing condition and forecasted through the 50-year period of analysis under the No Action or FWOP condition. This forecast takes current trends and projects the resource conditions in the study area into the future, should no action be taken to intervene

3.1.1 Topography and Geology

a. Existing. The topography of the area consists of bands of higher elevation in-between bands of lower elevation ranging from 360 to 375 feet above sea level. Figure 4 shows 2016 LiDAR of the study area. The shallow swales lie at 360 feet, while the ridges rise to 375 feet. The interior of the area has large, flat fields with little topographic diversity averaging 370 feet. The underlying geology of the area consists of the Lower Pope Group (Aux Vases Sandstone through Glen Dean Limestone). The Lower Pope Group only occurs in southern Illinois south of 40 degrees latitude and consists of sedimentary rock of Mississippian age. Figure 5 shows levees within the vicinity of the potential project area. Although there is still existing topographic variation throughout the study area, it has been reduced due to the changes in land-use, hydrology, and sedimentation in the past 150 years. This is reflective of the current site-level decline in vegetative community diversity and limited elevation suitable for hard mast species. More details about these levees can be found in Appendix A – Hydrology and Hydraulics.

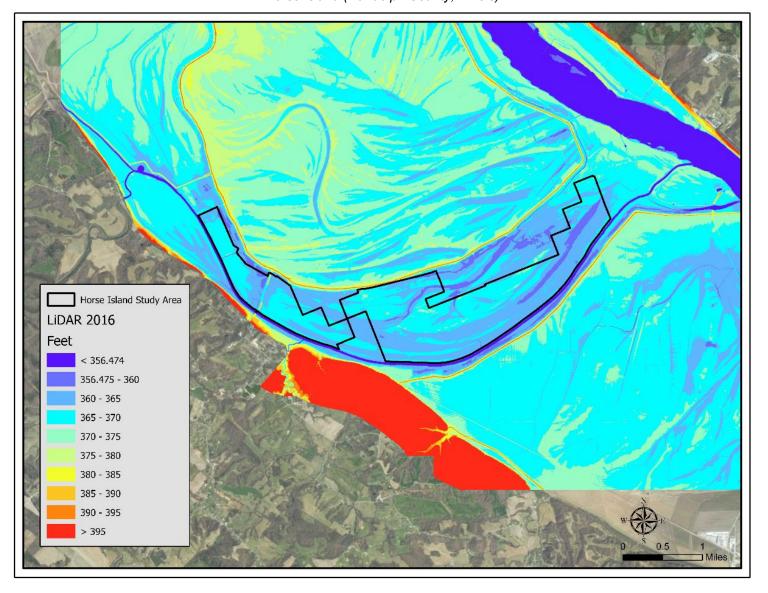


Figure 4. LiDAR (2016) throughout and around study area

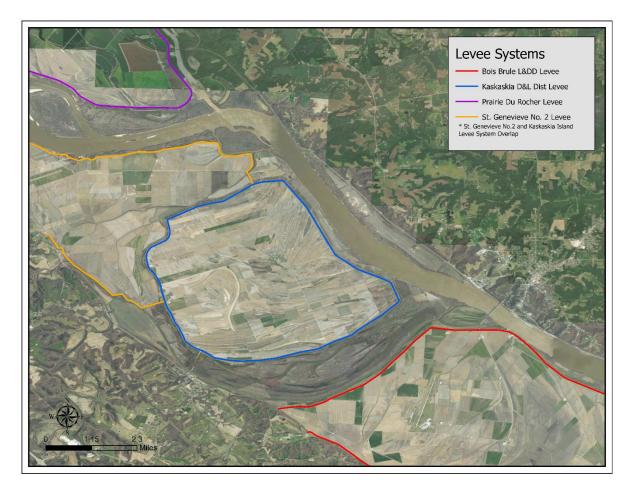


Figure 5. Levee systems in the vicinity of the study area

b. No Action (Future Without Project Conditions). Over time, the open water wetlands may fill in with sediment as seasonal flooding deposits material onto the upland areas of Horse Island. Similarly, the small variations in topography present on the island would also fill in. The local topography on the island would be more uniform in the FWOP condition. Sedimentation will continue to slowly fill in lower elevation swales and wetlands; however, the rate of sedimentation and erosion in the study area would no cause significant changes to current topography suitable for increasing diversity of forest communities. There would be no expected increase in elevation suitable for hard mast and mixed forest communities, and areas with mature pecan would remain the same. There would be no change to the extent of elevation suitable for hard mast with no action in future without project conditions since the highest elevations are expected to remain at the same extent. It is expected that the diversity of vegetative communities would stay the same or decline over time. Geology would not be affected.

3.1.2 Soils and Prime Farmland

The soils resources section addresses compliance for the following applicable environmental laws and regulations:

• Farmland Protection Policy Act of 1981 (7 USC 4201 et seq.) 7 CFR 657-658

- 7 USC 4201, Prime and Unique Farmland
- Soil Conservation Act (16 USC 590(a) et seq.)
- Clean Water Act Section 402
- a. Existing. Figure 6 shows soil ratings in the study area. The soils in the study area are typical of floodplain areas and consist primarily of Darwin silty clay, Nameoki silty clay, and Haynie silt loam. The Darwin soils series consists of very deep, poorly and very poorly drained, very permeable soils formed in clayey alluvium on floodplains. Darwin silty clay soils, which represent the primary soil classification of the study area, are not prime farmland. The study area does contain other small patches of soils that would be designated as prime if drained, protected from flooding, or if not flooded during the growing season. However, the soils on Horse Island are not protected from flooding and can often be flooded during the growing season.

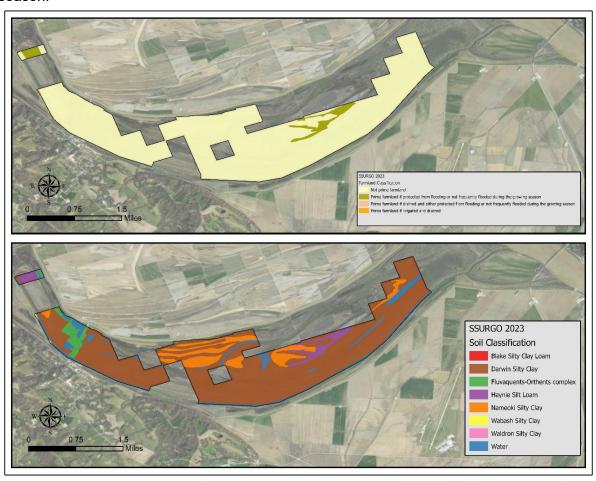


Figure 6. Soils and Farmland Classification in the study area

b. No Action (Future Without Project Conditions). Seasonal flood events would continue to deposit sediment onto Horse Island that would become a part of the area's soil over time. The soil compositions would change according to inputs from seasonal flood events in the FWOP condition. The existing patches of Prime Farmland on the USFWS-owned land on Horse Island are classified as Prime Farmland only if drained, an action that would not occur in this alternative. Prime Farmland would not be affected by the No Action alternative.

3.1.3 Land Use/Land Cover

This section addresses compliance for the following applicable environmental laws and regulations:

- Executive Order (EO) 11990, Protection of Wetlands
- EO 11988, Floodplain Management
- Fish and Wildlife Coordination Act
- Clean Water Act Section 404: Specific impacts to water quality due to displacement of water bodies by fill materials, stockpiling, and hydromodifications will be described in the 404(b)1 evaluation.
- Clean Water Act Section 401
- Clean Water Act Section 402
- Section 906(d) of WRDA 1986

Permanent impacts to wetland habitat can include the reduction in overall area of wetlands within the study area through filling or conversion to other land cover types. Temporary impacts can include erosional sedimentation pollution and temporary access routes or staging areas within a wetland.

a. Existing. Historically, the Mississippi River was a complex mosaic of prairies, forests, wetlands, marshes, and clear water lakes (Theiling C., 1999; Theiling, et al., 2000) enhanced by the annual flood pulses that advance and retreat over the floodplain (Sparks & Lerczak, 1993). The pre-settlement landscape of the Mississippi River Basin was approximately 66 percent prairie and 29 percent forest. Open water and wetlands once accounted for four percent of the Basin (U.S. Army Corps of Engineers, 2007). Most of the prairie was located on the mainland and the islands were mainly forested. The mosaic of land cover types were maintained by disturbance (i.e., flooding and fire). The human-induced alteration or elimination of the disturbance regime has resulted in a more homogeneous environment, with an associated loss in ecological complexity and integrity.

The majority of the Mississippi River Basin floodplain is used for row-crop agriculture. The remaining wetlands and floodplain in the floodplain are important because they provide important resting, breeding, and foraging habitats for fish and wildlife. **Figure 7** depicts the land cover classes for the study area according to the 2011 LTRM data. The natural habitats in the study area are wet forest (floodplain forest, salix community, and populus community), shallow marsh, and wet shrub. The areas identified as shallow marsh are fallow agricultural fields that are dominated by weedy species, scrub-shrub habitat, and patches of young early successional forest of cottonwood and willow. **Figure 8** shows the wetland classifications in the study area. The study area also contains existing wetland swales that have been identified by USFWS using aerial leaf-off imagery, infrared imagery, National Wetlands Inventory (NWI) wetlands maps, and USGS growing season flood inundation model data. Some are almost permanently wet, and some are ephemeral.

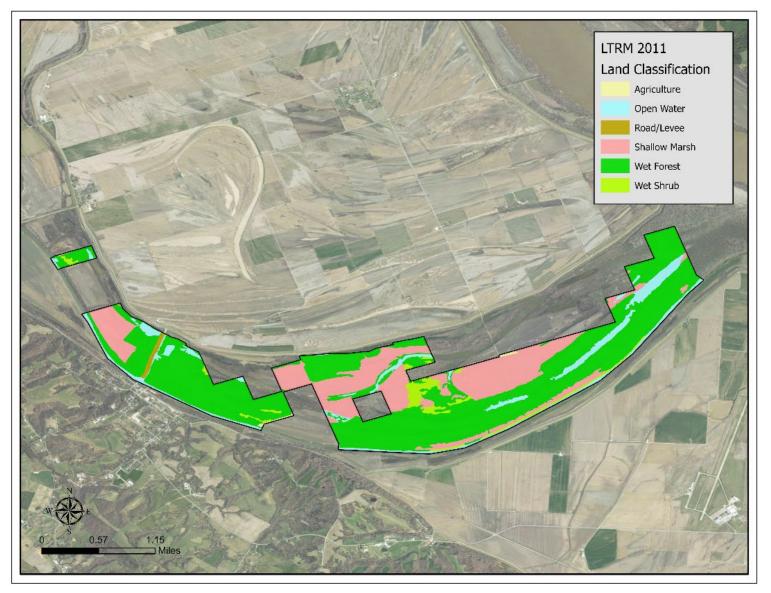


Figure 7. 2011 Land Cover for the study area

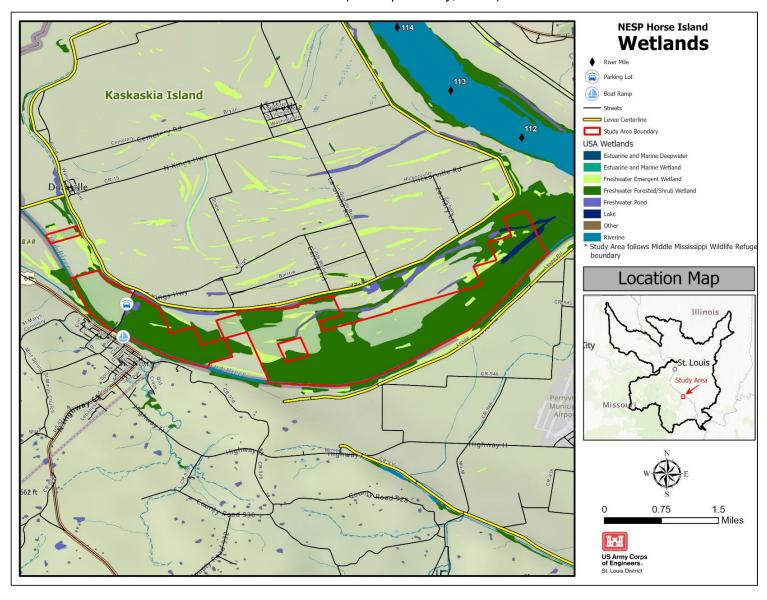


Figure 8. Wetland classifications in the study area

b. No Action (Future Without Project Conditions). The USFWS would continue to manage the areas on Horse Island as public land. Land cover is expected to be impacted by invasive species, a decline in natural regeneration of forest habitat, a decline in structural diversity across the study area, and hydrologic variability. Invasive species such as Japanese Hops are expected to colonize canopy gaps and prevent growth of native vegetation and suppress forest succession. Emerald Ash Borer (EAB) will continue to kill mature ash in the study area, creating canopy gaps that could be overtaken by invasive species. There may be a decline in forest cover in even-aged willow stands as the canopy trees age and die without a cohort of younger trees in the understory to replace them. The fallow agricultural fields are expected to remain partially unforested, further transitioning into scrub-shrub and -field habitat dominated by non-native weeds. Patches of early successional forest will continue to establish and increase forest cover in the old fields over time.

There would be a continued lack of hard mast trees across the study area due to a decline in natural recruitment and an absence of suitable topographic variation. The private landowners may or may not continue to use their land for agriculture, or to develop it for other purposes. Land Use/Land Cover would be adversely impacted by the No Action alternative.

3.1.4 Hydrology and Hydraulics (H&H)

This section introduces the existing and future without project conditions, as it pertains to hydrology and hydraulics.

a. Existing. This project is located on the open river, downstream of the series of locks and dams on the Mississippi River. Being on the open river, this project will be exposed to large fluctuations in WSE and flow. USGS Gage (07020500), Mississippi River at Chester, IL (operated in conjunction with the USACE St. Louis District) is located about one mile downstream of the project area at RM 109.9 (Table 5).

Table 5. Flood Stage	Information for St.	Louis and Chester	Gages.

Gage	Flood	Flood	Flood	Structure	AEP for
Location	Stage (ft)	Elevation	Flow	Elevation	Flood
		(ft, NAVD88)	(cfs)	(ft, NAVD88)	Stage
St. Louis	30.0	409.58	517,00	394.38	20-50%
			0		
Chester	27.0	367.73	417,30	358.33	>50%
			0		

Figure 9 plots the percent exceedance for WSEs at the Chester gage for the past 50 years (1974 - 2023). This dataset will include the effects of all major infrastructure and reservoirs on the river. Additionally, **Figure 10** shows the maximum, minimum, and average WSE at Chester over the same time period (1974 - 2023).

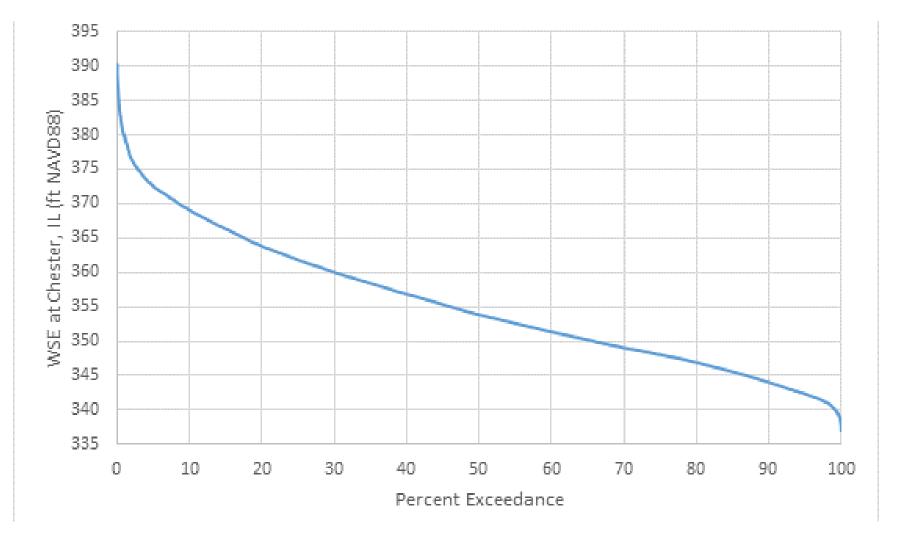


Figure 9. Percent Exceedance WSEs at Chester, IL

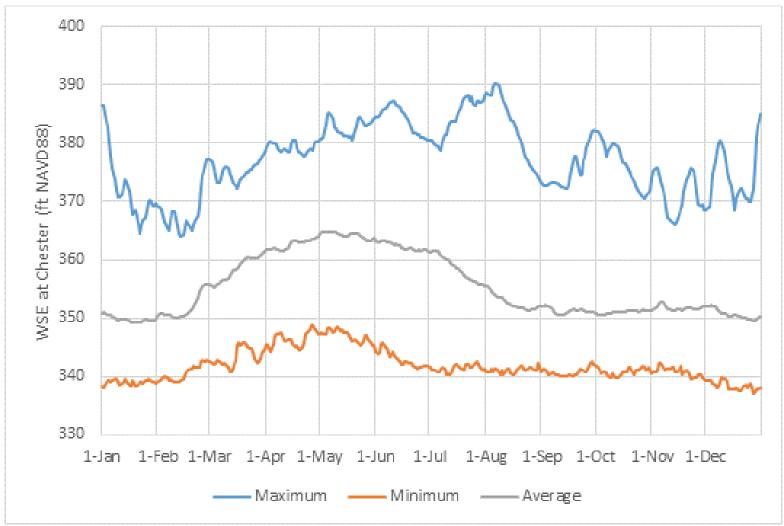


Figure 10. WSE Seasonality at Chester, IL

As seen in **Figure 10** the highest WSEs generally occur during April and May and the lowest tend to be in December and January.

Figure 11 below identifies key features related to the H&H conditions of the study area. Yellow lines are used to represent levees that influence the area. These levees have varying levels of protection. The location of the gage at Chester, IL is shown by a red circle. Lastly, the old main channel of the Mississippi River is identified in blue. As the water elevations in the main river channel rise, backwater from the Mississippi River inundates the project area. The old Main Channel fills in first, overtopping the banks (black arrows) and inundating the Horse Island area. Inundation across the site depends on hydraulic connection and elevation. During large events, levees in the surrounding area can overtop changing the flow of water through the area.

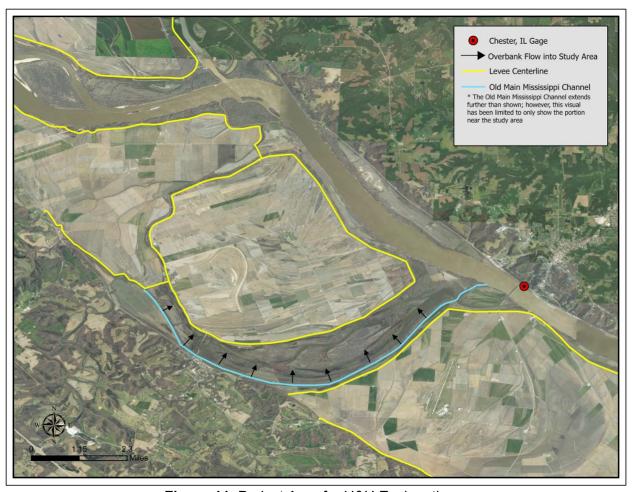


Figure 11. Project Area for H&H Explanation

The Hydraulic Engineering Center River Analysis System version 6.4.1 was used to construct a two-dimensional numerical model of the Horse Island study area. The model extends from the upstream end of Sainte Genevieve, Missouri (near RM 125) to the Red Rock Landing Gage (near RM 94). The model was calibrated to three WSEs at Chester: 360 ft NAVD88 (water has nearly filled the old main channel of the Mississippi River), 365 ft NAVD88 (water is starting to inundate the Horse Island area), and 370 ft NAVD88

(water has nearly inundated the entire Horse Island area). The model was also validated to other low flow and high flow events. More details of this analysis can be found in Appendix A – Hydrology and Hydraulics.

b. No Action (Future Without Project Conditions). Hydrologic trends show that the project area will continue to see large fluctuations in the water depth. This area is likely to see slow increases in sedimentation, particularly in the old main channel of the Mississippi River. Changes in sedimentation have the potential to reshape some of the hydraulic connectivity (or drainage patterns) in the area, but the study area is likely to have similar hydraulic connectivity to the existing conditions.

3.1.5 Noise

This noise section addresses compliance for the following applicable environmental laws and regulations:

- Noise Control Act of 1972, as amended by Quiet Communities of 1978
- National Environmental Policy Act

Adverse impacts to noise can include an alternative that would result in substantial permanent increase in ambient noise levels for adjacent sensitive receptors, or exposure of persons to or generation of noise and vibration levels in excess of standards established by local/regional noise ordinances (**Figure 12**).

a. Existing. Noise levels surrounding the study area are varied depending on the time of day and season. The current human activities causing elevated noise levels in the vicinity of the study area includes agricultural production, recreation (hunting), recreational boat traffic, and commercial navigation. A recreational boat or barge traffic noise range can typically be between 65-115 decibels (dB) (USEPA, 1974). Infrequent horn blasts may be in excess of 120 dB at one foot. Noise during the hunting season may occur with a typical 12 gauge shotgun blast at 130 dB. All of these may contribute to noise levels within the study area.

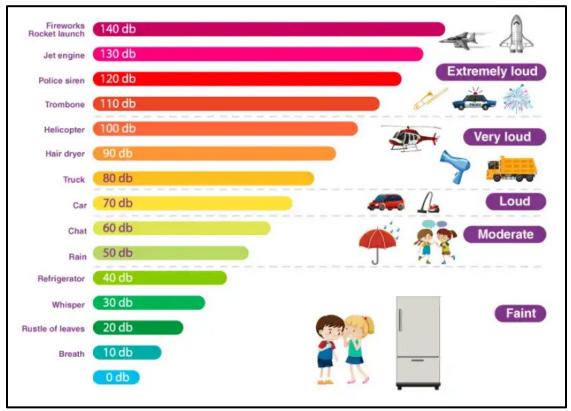


Figure 12. Example indoor and outdoor activities associated with common noise levels.

b. **No Action (Future Without Project Conditions).** Existing noise levels would not change from current conditions. Noise concerns would not be impacted by the No Action alternative.

3.1.6 Air Quality

This air quality resources section addresses compliance for the following applicable environmental laws and regulations:

- Clean Air Act
- General Conformity Rule

Impacts to air quality could include an alternative resulting in emissions that exceed the General Conformity de minimis thresholds associated with the Clean Air Act. Impacts to air quality would be temporary, ending after construction is complete.

Existing. The Clean Air Act of 1963 requires the U.S. Environmental Protection Agency (USEPA) to designate National Ambient Air Quality Standards (NAAQS). The USEPA has identified standards for six criteria pollutants: ozone, particulate matter (PM₁₀ = less than 10 microns; and PM_{2.5} = less than 2.5 microns in diameter), sulfur dioxide, lead, carbon monoxide, and nitrogen dioxide. Randolph County is currently in attainment for these air quality standards. The main sources of emissions on the island are from the combustion of diesel and unleaded gas. Agricultural operations, commercial navigation, and recreational use of the island would be the main causes of these emissions.

a. No Action (Future Without Project Conditions). The attainment status of Randolph County may change in the future, but not as a result of the No Action. Nothing would be built that would temporarily or permanently adversely affect air quality in Randolph County. Air Quality would likely remain the same as existed conditions. Sources of emissions are likely to remain similar in quantity and type as existing conditions. Agricultural and recreational use would continue to drive these emission sources.

3.1.7 Water Quality

This water resources section addresses compliance for the following applicable environmental laws and regulations:

 Clean Water Act Section 401, 402, and 404 (see Section 5.53 and Appendix B for full details)

Impacts to water resources could result from an alternative that caused long-term or permanent violations of state water quality standards or otherwise substantially degraded water quality.

a. Existing. Water Quality Standards (WQS) are the foundation of the Clean Water Act. An objective of the Clean Water Act is to restore and maintain the chemical, physical and biological integrity of the nation's waters. Two Sections of Illinois Administrative Code (IAC) 35, Section 302, Water Quality Standards and Section 303, Water Use Designations and Site-Specific Water Quality Standards, contain the standards applicable to lakes and streams. The objective of the WQS is to protect uses by applying criteria. Water quality criteria are expressed as concentrations, loads or narrative statements. The level of protection given to a stream, river, or lake depends on the expected, or "designated use(s)," of that water. Once a designated use is assigned to a water body, it is considered "classified" and listed in the Illinois WQS as such. Illinois waters are designated for various uses including aquatic life, wildlife, agricultural use, primary contact (e.g., swimming, water skiing), secondary contact (e.g., boating, fishing), industrial use, public and food-processing water supply, and aesthetic quality. Antidegradation policy requires actions to maintain and protect high quality waters and existing water quality.

Illinois EPA 303(d) - The Mississippi River within the vicinity of the study area (Assessment ID IL-D-01) is listed in the Illinois 2022 303(d) list for impairment for Aldrin, Dieldrin, Endrin, fecal coliforms, Heptachlor, mercury, Mirex, polychlorinated biphenyls, and Toxaphene based on fish consumption (Illinois Environmental Protection Agency, 2023).

Section 401 Compliance - Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the TSP would be designed to be compliant with section 404(b)(1) Guidelines (40 CFR 230) should it not meet the conditions of a Nationwide Permit. If the TSP does not meet the conditions of a Nationwide Permit, then an Individual Illinois EPA 401 Certification would be pursued.

Section 402 Compliance – If the TSP results in at least one acre of soil disturbance then a Clean Water Act Section 402 Permit would be pursued.

Section 404 Compliance - Section 404 of the Clean Water Act regulates the placement of fill, such as rock, in waters of the United States. Specific impacts to water quality include displacement of water bodies by fill materials, stockpiling, and hydromodifications.

b. **No Action (Future Without Project Conditions).** There would be no construction that could cause erosional sedimentation nor any discharges of fill into nearby bodies of water. Current impairment levels are unlikely to be affected by the No Action. Water quality would likely remain the same as existing conditions. The No Action would not involve any impacts to Waters of the United States. Section 401, 402, and 404 compliance is not applicable.

3.1.8 Meteorological Conditions

- a. **Existing.** Meteorological data for the study area was obtained from the National Weather Service from the weather station at the Jerry F. Costello Lock and Dam. Data from the nearer Chester, IL did not include temperature, so it was not used. The study area has a continental climate type, which means that its winters are cold and dry, and its summers are warm and wet. The transition season of spring tend to be very wet, while the fall seasons tend to be dry. The average annual temperature is 54°F, with an average high temperature of 86.8°F in July, and an average low temperature of 37.7°F in January. The average yearly rainfall is 42.25 inches, with the greatest average accumulation in April and May.
- b. **No Action (Future Without Project Conditions).** An assessment of weather related risks in the project's region and watershed was conducted to identify the potential changes in weather and hydrology that may occur in the project's life cycle. This assessment is attached in Appendix I Resilience Assessment. The local meteorological conditions are expected to remain the same as existing conditions.

3.1.9 Hazardous, Toxic, and Radioactive Waste (HTRW)

a. Existing. USACE regulations (ER-1165-2-132, ER 200-2-3) and District policy requires procedures be established to facilitate early identification and appropriate consideration of potential HTRW in feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting Phase I Environmental Site Assessment (ESA). USACE specifies that these assessments follow the process/standard practices for conducting Phase I ESAs published by the American Society for Testing and Materials (ASTM). The purpose of a Phase I ESA is to identify, to the extent feasible in the absence of sampling and analysis, the range of contaminants (i.e., RECs) within the scope of the USEPA Comprehensive Environmental Response, Compensation and Liability Act, and petroleum products. Current policy is to avoid known HTRW sites. A Phase I ESA has been completed for the project area using methods outlined by ASTM E2247-23 (American Society for Testing and Materials International, 2023) and is attached in Appendix F. This included a records review, physical site visit, and communications with persons knowledgeable of the project footprint and adjoining properties. Generally, the project area contains no major sites of interest which pose significant HTRW concerns. The environmental impact for the migration of off-site contaminants onto the project property is negligible. Therefore, no special considerations are being recommended for the project to proceed to construction. The USACE Environmental Quality Section should be contacted

immediately if HTRW material is encountered at any point during construction activities.

b. No Action (Future Without Project Conditions). Any existing HTRW concerns are likely to be similar to the existing conditions. Any unidentified HTRW concerns would remain present in the study area.

3.1.10 Aquatic Habitat/Fish

This fisheries resources section addresses compliance for the following applicable environmental laws and regulations:

• Fish and Wildlife Coordination Act

Impacts to aquatic habitat and/or fish could occur if an alternative resulted in substantial loss of desired aquatic habitat for native species or the substantial loss of fishes within the study area.

a. **Existing.** Historically, the fishery in the Mississippi River was exceptional, with a 200-mile reach producing ten percent of the total U.S. catch of freshwater fish in 1908, more than any other river in North America (Sparks R. E., 1992). The river is home to 115 fish species, 95 percent are native species. A group of aquatic organisms that is particularly representative of the Mississippi River include American paddlefish (*Polyodon spathula*) and pallid sturgeon (*Scaphirhynchus albus*). The majority of these fish are migratory by nature and use a diversity of river habitats, flowing channel habitats, side channels, and backwater areas. Many native fish populations are considered limited in the Mississippi River from the loss of backwater areas that provide sufficient depth for spawning, nursery, and overwintering habitat and competition with non-native species (U.S. Army Corps of Engineers, 2007).

Past actions within the Mississippi River Basin have adversely impacted the fisheries resources by disconnecting the river from its floodplain, altering hydrology and sedimentation. These actions have led to loss of access to important habitat for spawning, rearing, and foraging. It is expected that the 9-foot navigation channel will continue to contribute to degradation. In general, these impacts could be offset by an adaptive environmental restoration approach that focuses on the re-creation or enhancement of key processes (periodic drawdown, connectivity) and habitat features such as island/side channel creation or restoration. Several restoration programs have been initiated to achieve this goal. However, current management and restoration levels have not fully addressed system-wide habitat degradation. Additional, sustained restoration actions and water quality improvements, both within the channel of the UMRS and its watershed would be needed to improve habitat and river system quality long-term. Increased efforts to reverse human-induced effects on aquatic habitats, vegetation succession and forest health will be required to sustain ecosystem values such as the restoration of island habitat and side channels in the Mississippi River.

The wetlands on the island offer aquatic habitat for a variety of aquatic insects, crustaceans, amphibians, reptiles, and mollusks. Snakes, turtles, salamanders, frogs, and toads can all be expected to occur in these wetlands. Turtle species could include snapping turtles (*Chelydra serpentina*), river cooter (*Pseudemys concinna*), and redeared slider (*Trachemys scripta*). The northern water snake (*Nerodia sipedon sipedon*) can be expected to occur as well. Amphibians like American toad (*Anaxyrus*)

americanus), spring peeper (*Pseudacris crucifer*), green frog (*Lithobates clamitans*), bullfrog (*Lithobates catesbeianus*), and northern leopard frog (*Lithobates pipiens*) could occur on the island. Aquatic insects would be abundant where/when conditions allow.

b. No Action (Future Without Project Conditions). The fisheries resources provided by USFWS-managed backwater areas on Horse Island will continue to decline in quality. Sedimentation would continue to fill in important off-channel areas, degrading fisheries habitat. Future actions by private landowners in the study area are unlikely to benefit fisheries resources.

3.1.11 Terrestrial Habitat/Wildlife

This wildlife resources section addresses compliance for the following applicable environmental laws and regulations:

- Fish and Wildlife Coordination Act
- Bald and Golden Eagle Act of 1940, as amended.
- Migratory Bird Treaty Act of 1918
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

Impacts to wildlife could occur if an alternative resulted in substantial loss of native wildlife habitat or the substantial loss of wildlife within the study area as a result of implementing the considered action alternatives.

a. **Existing.** The Migratory Bird Treaty Act (MBTA) of 1918 provides protection for bird species native to North America. Horse Island is in the Mississippi Flyway, a bird migration route which follows the Mississippi River, the Missouri River, and the Lower Ohio River in the United States. The habitats along the Mississippi Flyway are important nesting and feeding areas for many migratory birds and waterfowl species. A variety of migratory birds might occur in the project areas, some as migrants and some as breeders, depending on the time of year. Year-round residents would also be present.

Although the bald eagle (*Haliaeetus leucocephalus*) was removed from the federal list of threatened and endangered species in 2007, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA prohibits unregulated take of bald eagles, including disturbance. The USFWS developed the National Bald Eagle Management Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute disturbance. There is an existing, active bald eagle nest on the USFWS-managed area on Horse Island. The National Bald Eagle Guidelines will be implemented if this nest, or any other bald eagle nest, is found to be within 660 feet of any construction areas, staging areas, or access routes.

On 12 October 2023, USACE and USFWS toured the existing terrestrial habitats found on Horse Island. The terrestrial bottomland floodplain habitats on Horse Island are a mix of floodplain forest (primarily willow and maple-ash-elm), old field, and wetland habitats. The wetland habitats consist of open water sloughs, with some emergent vegetation around the edges, and swamp-shrubland habitat. These areas retain no permanent connection to the Mississippi River. Some lower elevations within these wetlands retain

shallow water after floodwaters recede. Swamp shrubland habitat, primarily composed of buttonbush (*Cephalanthus occidentalis*) and swamp privet (*Foresteria acuminata*), has increased in the wetlands (**Figure 14**). Forested areas in the lower elevations are dominated by Willow forest community. Black willow (*Salix nigra*), forms a monoculture throughout these stands (**Figure 15**). There is little-to-no regeneration of desirable native tree and shrub species in the understory. These even-aged stands of willow represent one of the most common community types in the study area.

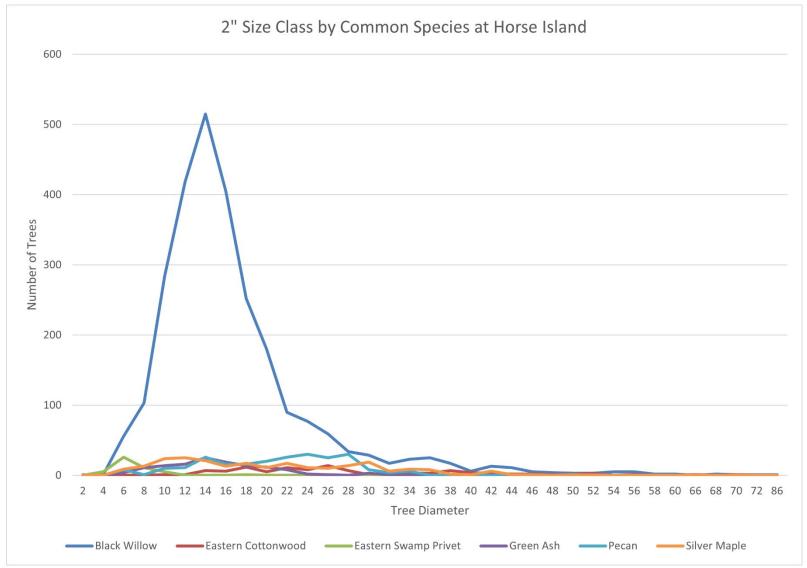


Figure 13. Forest inventory data was collected in 2024. A summary of trees counted by 2" size class of the six most common species demonstrates the dominance of black willow throughout the study area.



Figure 14. A photo of a shallowly-flooded wetland area surrounded by forest.



Figure 15. A photo of the willow stand monoculture at a low elevation patch of forest.

In the middle elevations, floodplain forest habitat is dominated by silver maple (Acer saccharinum), green ash (Fraxinus pennsylvanica), cottonwood (Populous deltoides). and other common floodplain tree species. Forest stands with high density of green ash are expected to experience an increase in canopy gaps as a result of EAB (Agrilus planipennis) leaving behind full-sun gaps in the canopy. Existing gaps in the forest canopy are often covered in spreading vines like bur cucumber (Sicyos angulatus) and Japanese hops (Humulus japonicus). Higher elevation stands have a Mixed forest community that includes mature pecan (Carya illinoensis) and exhibit more species diversity and structural complexity compared to middle and low elevation floodplain forest. There is some natural recruitment of pecan in the understory of these mixed stands; however, these young saplings are being shaded out by maple, cottonwood, and other species. (Figure 16). The Illinois State Champion pecan (Carya illinoinensis) is within the Horse Island Unit. There is no oak component to these higher-elevation forests. Mature pecan can be found throughout the project area, indicating the past extent of hard mast in Horse Island. However, there is limited regeneration except in higher elevation stands. The understory in many of the floodplain and willow stands has little regeneration of desirable floodplain tree species, native understory woody species. nor native herbaceous plants. Overall diversity of forest structure, species, and community type is low.



Figure 16. A photo of the pecan overstory in a high elevation patch of forest.

The study area is also composed of approximately 20% old field habitat, which has been fallow since the 1990s. The fields are dominated by dense weedy cover, scrub-shrub habitat, and patches of young early successional forest. The non-native and native weedy vegetation has prevented the establishment of forest, except in lower elevation areas where variable inundation has exposed soil cover for seed catch. Early successional species such as cottonwood and willow have been able to establish in some of these areas. However, the majority of the old field habitat remains unforested.

A high-density forest inventory was conducted between July 2024-March 2025 within the Horse Island Unit to assess current forest conditions using the USACE Forest Inventory Phase II protocol. This inventory will gather stand level forest metrics that will be analyzed to develop management plans and inform Project design. Inventory was completed in March 2024. Stand walks will be conducted by USFWS and USACE foresters spring 2025 utilizing this data to write forest management prescriptions.

Many mammal species occur on Horse Island, including white-tailed deer (*Odocoileus virginianus*), cottontail rabbit (*Sylvilagus floridus*), fox squirrel (*Sciurus niger*), gray squirrel (*Sciurus carolinensis*), river otter (*Lontra canadensis*), American mink (*Neovison vison*), muskrat (*Ondatra zibethicus*), American beaver (*Castor canadensis*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), and long-tailed weasel (*Mustela frenata*). A variety of nocturnal species are also present, including marsh rice rat (*Oryzomys palustris*), deer mouse (*Peromyscus maniculatus*), prairie vole (*Microtus ochrogaster*), short-tailed shrew (*Blarina brevicauda*), and many bat species. Eastern box turtle (*Terrapene carolina*), rat snake (*Pantherophis obsoletus*), eastern racer (*Coluber constrictor*), and northern water snake (*Nerodia sipedon*) also occur in the area.

b. No Action (Future Without Project Conditions). The current status of bald eagles on Horse Island is likely to remain the same. However, the current number of available nesting trees is likely to decrease due to a lack of natural tree regeneration in the understory and competition with invasive species. Overall, the reduced sustainability and diversity of floodplain forest habitat is likely to result in less available habitat for terrestrial wildlife and migratory birds. There is also the risk of development of monotypic stands, further reducing forest health and sustainability. The monotypic stands of willow found throughout the project area have little natural regeneration of native trees in the understory, which may result in a loss of forest cover as mature willow trees in the canopy die without a younger cohort of trees to replace the canopy. Forest stands are likely to continue to have low species diversity and low structural diversity. Canopy gaps created by ash mortality as a result of emerald ash borer, or other means, may be overtaken by invasive species such as Japanese hops, preventing the natural succession of forest habitat, reducing forest cover, and further degrading forest resources. Hard mast is expected to remain the same or decline over time due to insufficient elevation to support these species and competition from less desirable floodplain species. Wetland-dependent wildlife would be adversely impacted as the existing wetlands degrade and fill in over time. The fallow agricultural fields are expected to remain partially unforested, with patches of early successional forest and scrub-shrub habitat.

3.1.12 Threatened & Endangered Species

This section addresses compliance for the Endangered Species Act Section 7. If it is

determined that adverse impacts to federally listed species are unlikely, then informal consultation with the USFWS would be requested. If it is determined that adverse impact is likely, formal consultation and a Biological Opinion would be requested instead. A full Biological Assessment can be found in Section 5.12.

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, an updated list of species and critical habitats potentially occurring in the vicinity of the proposed work areas was acquired from the USFWS Information for Planning and Conservation (IPaC) website at (https://ecos.fws.gov/ipac/) on 7 March 2025 (Project Code: 2023-0128121). There are no designated Critical Habitat locations in the project area. Habitat requirements and impacts of the proposed action are discussed for each listed species. The species included in the IPaC are Indiana bat, tricolored bat, pallid sturgeon, and monarch butterfly (**Table 6**).

Table 6. List of federally threatened and endangered species and habitat potentially occurring in the vicinity of the proposed project, acquired from the USFWS Information for Planning and Conservation (IPaC) website.

Common Name (Scientific Name)	Classification	Habitat
Indiana Bat (<i>Myotis sodalis</i>)	Endangered	Uses caves and mines for winter hibernacula; uses trees for summer roosting. Forages along small stream corridors with well-developed riparian woods and in upland forests.
Tricolored bat (Perimyotis subflavus)	Proposed Endangered	In summer, roosts in structures, trees, cliffs, and caves. In winter, hibernates in caves.
Pallid Sturgeon (Scaphirhynchus albus)	Endangered	Large, deep, turbid river channels, usually in strong current over firm sand or gravel.
Monarch Butterfly (Danaus plexippus)	Candidate	Uses milkweed plants as a reproductive host. Found in open grassy areas with milkweed.

Existing Indiana bat and tricolored bat habitat in study area: Suitable habitat for these bat species exists within the study area. Potential roost trees are present within the study area forested stands with larger diameter trees. Some snag trees are also present, scattered throughout the forested areas of the study area. In some areas, the understory has open lanes for bat movement. The highest elevation forest has more open flight lanes. Openings in the canopy covered in creeping vines and areas with a denser understory present barriers to flight.

Existing pallid sturgeon habitat in study area:

There is no pallid sturgeon habitat on Horse Island since it is primarily composed of terrestrial habitat and wetlands with no connection to the river channel. There may be suitable habitat in the main channel of the Mississippi River adjacent to the study area. There are no measures proposed in the main channel of the Mississippi River.

Existing monarch butterfly habitat in study area: The forested areas would not be suitable habitat but the open old fields would be suitable habitat. Flowering herbaceous

plants in the old fields provide a nectar source for adult monarch butterflies. There may also be some patches of host milkweed along forest edges, in forest openings, and in other open habitats where conditions allow. However, much of the old field habitat is dominated by weedy annuals rather than perennial native wildflower more suitable for monarch butterflies.

a. No Action (Future Without Project Conditions). Without some intervention, the floodplain forest habitats on Horse Island will continue to degrade in quality, adversely impacting bat species using these habitats for roost trees and foraging habitat. As the existing mature forest continues to age and die out, the lack of mid and understory trees will result in large canopy gaps that will likely be overtaken with invasive and non-desirable species. There may be a short-term gain in habitat from snags created by the aging canopy, but there may be a long-term decrease as forest cover slowly declines over time. The status of monarch butterflies in the study area is likely to remain the same, as the old field habitats used by these butterflies are unlikely to change substantially in the No Action alternative.

3.1.13 Invasive Species

This invasive species section addresses compliance for the following applicable environmental laws and regulations:

- EO 13112, Invasive Species
- EO 13751, Safeguarding the Nation from the Impacts of Invasive Species

Impacts to invasive species could result from an alternative that caused a substantial spread or introduction of invasive species into the study area.

- a. **Existing.** The primary invasive species of concern at Horse Island are Japanese hops and emerald ash borer. Japanese hops is an annual vine that quickly becomes established in gaps in the forest canopy. It is present throughout the Horse Island study area in existing canopy gaps, out-competing native vegetation and preventing regeneration of desirable tree species. Although native, bur cucumber is an annual weedy vine that also overtakes canopy gaps, similarly preventing regeneration of native species. It is also a species of concern for this project area. The EAB is an invasive insect that is causing high mortality of green ash in the study area. EAB infestations typically result in 100% mortality of native ash in a stand. Zebra mussel (*Dreissena polymorpha*), bighead carp (*Hypophthalmichthys nobilis*), and silver carp (*Hypophthalmichthys molitrix*) are present in the Mississippi River adjacent to the study area. No permanent sources of water exist within the study area to support these invasive species. However, during high-water events, these invasive species would be present in the aguatic habitats temporarily.
- b. **No Action (Future Without Project Conditions).** The establishment and spread of invasive species in the project area is likely to increase. Canopy gaps will continue to be overtaken by Japanese Hops and other undesirable species, suppressing the growth of trees and native understory species. New canopy gaps will develop as emerald ash borer continues to kill ash trees, which could then be susceptible to invasive species. New invasive species that are not yet present on Horse Island may become established. Federal, state, local laws, programs, and regulations aimed at invasive species

management and control would be expected to continue. Invasive species concerns would be adversely impacted in the No Action Alternative.

3.1.14 Historical and Cultural Resources

This section addresses compliance for the following applicable cultural resource laws and regulations:

- NEPA
- NHPA, Section 106
- Archaeological Resources Protection Act (ARPA)
- Native American Graves Protection and Repatriation Act (NAGPRA)
- EO 13007, Indian Sacred Sites

Impacts to cultural resources could result from an alternative that directly or indirectly affects the integrity of the cultural resource.

a. **Existing.** Historic maps from 1875 to 1970 were investigated. The maps indicate that the study area was located in the Mississippi River channel in the 19th century and had not yet formed to its present-day extent. Sedimentation began to create land masses at the beginning of the 20th century, and, by 1908, the study area consisted of forest, wetlands, and sloughs. By 1919, the area had experienced sedimentation to the point that it was divided and sold as individual land parcels as part of Survey No. 5 Kaskaskia Commons. None of the maps indicated buildings within the study area.

A review of Illinois State Historic Preservation Office (SHPO) files revealed that two cultural resource surveys have been conducted within the study area, but no historic properties have been identified. Survey 5510M was an Environmental Assessment (EA) from the U.S. Army Corps of Engineers, St. Louis District, for levee repair of the Cape Girardeau Flood Emergency Area that encompassed Alexander, Union, Jackson, and Randolph Counties, Illinois, and Ste. Genevieve County, Missouri. The EA determined that the individual levee districts will need to conduct cultural resource surveys before repairs can be completed. Based upon the cultural resource surveys being undertaken by the levee districts, USACE came to a finding of no significant impact.

Survey 10937 was conducted by the Illinois Transportation Archaeological Research Program (ITARP) in 2000 for a 3.5 acre borrow pit. The survey consisted of pedestrian and subsurface testing. The survey did not identify cultural resources. ITARP determined that because the survey was conducted in the old Mississippi River channel that continued to flood frequently, the potential for an archaeological site was extremely low. Project clearance was recommended (Witty 2000).

b. **No Action (Future Without Project Conditions).** No impacts to historical or cultural resources are anticipated in the No Action condition. If unknown cultural resources are within the study area, the continuous sedimentation caused by frequent flooding would bury them deeper and thus preserve them.

3.1.15 Socioeconomics

This section addresses compliance for the following applicable environmental laws and regulations:

- EO 13166, Improving Access to Services with Persons with Limited English Proficiency
- CEQ 1508.27(b)(3)
- National Environmental Policy Act, 23 USC Section 109(h) (NEPA)
- Wild and Scenic Rivers Act
- 1988 Visual Resources Assessment Procedure

Impacts to recreation would be considered adverse if an alternative resulted in a substantial effect to the long-term provision of, or access to, recreational uses in the area. Impacts to views (aesthetics) would be considered adverse if an alternative substantially degraded the existing visual character or quality of the site and its surroundings. Impacts to local communities would be considered significant if the considered action alternative resulted in a disproportionate, high adverse environmental impact to a minority or low-income population. Impacts to economic factors would be considered adverse if the considered alternative resulted in substantial shift in regional spending or earning patterns.

a. **Existing.** Existing socioeconomic data was gathered for Randolph County, Illinois from www.census.gov. The median household income was \$58,093. Approximately 15% of the population in Randolph, Illinois is below the poverty line. An estimated 85.1% of the population have a high school degree or higher, while 13.2% have a bachelor's degree or higher. Approximately 52.9% of the county population is in the labor force (between ages 16 and 64). The unemployment rate has decreased by 4.6% since the last census. Randolph County, Illinois, has a total population of 30,068. 5.1% of the population is under 5 years old, and 20.9% of the population over the age of 65. The population within the county is approximately 88.9% white, 8.5% black, 3.6% Hispanic or Latino, 0.4% American Indian and Alaska Native, and 0.6% Asian.

Aesthetics.

The aesthetics of the island are typical of the floodplain areas along the Mississippi in this region. Visual resources of the study area consist primarily of natural habitat. Horse Island has scenic habitat including forests, fields, wetlands, and a view of the Mississippi River on the far eastern boundary. A view of the old channel of the Mississippi River forms the southern boundary of the area.

Recreation.

Currently, the Horse Island study area is open to several recreational opportunities including hiking, fishing, bird watching, and limited hunting.

Local Communities/At Risk Communities.

Per Implementation Guidance of the Water Resources Development Act of 2020, Section 160, an economically disadvantaged community is defined as meeting one or more of the following:

- a. Low per capita income The area has a per capita income of 80 percent or less of the national average;
- b. Unemployment rate above national average The area has an unemployment rate that is, for the most recent 24-month period for which data are available, at least 1 percent greater than the national average unemployment rate; or

c. Indian country as defined in 18 U.S.C. 1151 or in the proximity of an Alaska Native Village;

d. U.S. Territories.

The study area does not contain any human communities. Horse Island is within Census tract #17157951200. The study team determined this tract is not considered disadvantaged. It does not meet any burden thresholds or at least one associated socioeconomic threshold.

b. No Action (Future Without Project Conditions). There are no disadvantaged communities in the study area. Socioeconomic factors are expected to be similar to existing conditions. Aesthetics and Recreation are likely to remain similar to existing conditions. Recreational opportunities would continue to be offered in a similar manner to existing conditions. The aesthetic of the island would continue to be a floodplain mosaic of agricultural fields, old fields, forests, and wetlands.

3.2. Resources Not Evaluated in Detail.

The PDT considered relevant environmental resources that would potentially be impacted by the proposed alternatives and eliminated resources that were not in the area of potential effect or would not be impacted by any of the alternatives from further evaluation. These resources include:

- Mineral and Energy Resources. The project does not propose to alter or impact the availability of mineral or energy resources.
- Wild and Scenic Rivers. Illinois has approximately 86,076 miles of river, of which 17.1 miles of one river (Vermillion River) are designated wild and scenic, which is not in the study area.

The PDT focused on information gathered from the study area and the area of potential effect.

4 PLAN FORMULATION

Plan formulation is the process of building alternatives (plans) that meet planning objectives, addressing the problems while avoiding constraints. The process helps decision-makers identify water resources problems, conceive solutions to them, and compare the importance of the inevitable conflicting values inherent in any solution. Economic, social, and environmental benefits, impacts, and costs are to be identified, measured, and/or qualitatively characterized using the P&G accounts, NED, EQ including NER plan, RED, and OSE. The plan formulation process considers all effects, beneficial and adverse, to each of these four evaluation P&G accounts.

This PIR-EA describes the systematic and repeatable planning approach the PDT implemented to ensure sound decisions are made in accordance with the process described in the Planning Guidance Notebook (ER 1105-2-103) and the P&G Guidelines. The USACE planning process consists of six steps including: (1.) Specify problems and opportunities, (2.) Inventory and forecast conditions, (3.) Formulate alternative plans, (4.) Evaluate effects of alternative plans, (5.) Compare alternative plans, and (6.) Select a recommended plan. The USACE planning process, as well as NEPA, requires USACE to evaluate a range of reasonable alternatives. This section describes plan formulation strategies that involve developing a wide range of potential actions or management measures (measures). Alternative plans are a set of one or more measures functioning together to address one or more planning objectives.

4.1 Management Measures

Management measures (measures) are constructed features or actions implemented to achieve the planning objectives. Several measures were identified in the early planning stages; many of these were partially developed, then were determined not feasible and did not undergo further evaluation. Measures that were further evaluated to a point appropriate for planning purposes to meet the goals and objectives outlined in Section 2.5, Project Objectives, are described below. The measures discussed below were identified from similar projects, the Upper Mississippi River Restoration Environmental Management Program Environmental Design Handbook (2012), NESP Design Pamphlets (2023), subject matter experts, and meetings with state and federal resources agencies. **Table 7** in Section 4.1.2 shows the measures and the objectives they primarily address.

The following are potential measures that could be combined into an implementable alternative that may be in the federal interest, address the identified problems, and achieve the project objectives.

- Tree planting in open areas
- Forest Stand Improvement (FSI)
- Wetland restoration
- Ridge and swale creation (topographic diversity)

4.1.1 Non-Structural Measures

The following measures are non-structural, natural/nature-based measures.

Tree planting in open areas: Planting trees to support forest species diversity and richness, increase forest cover, and increase diversity of forest communities to provide resources for forest-dependent wildlife. Includes afforestation: the act and process of establishing a forest especially on land not previously forested; or otherwise has lost its forested habitat. For

example, old fields are good candidates for tree planting. Tree planting will target community diversity, which can include early successional, wet bottomland, mixed, and bottomland hard mast (including floodplain ridge and riverfront terrace).

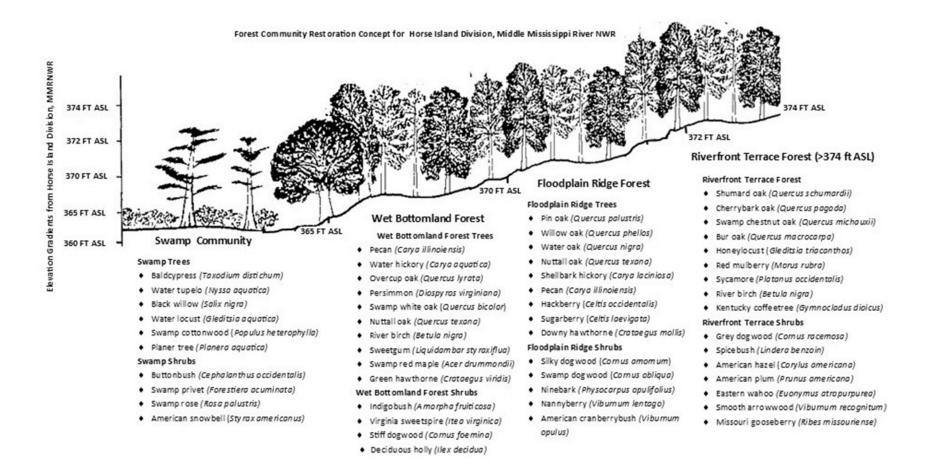


Figure 17. Middle Mississippi River NWR, Horse Island Division Floodplain Restoration Species List. Tree and shrub species listed in categorical forest communities for use in ecosystem restoration projects on the Middle Mississippi River National Wildlife Refuge.

Considerations for tree planting:

- Tree species selection will be site-specific to maximize long term survivability. Determining factors will include elevation, inundation days, stand-level management objectives, and vegetative competition.
- Planting will include three-gallon containerized stock to reduce susceptibility to vegetative
 and invasive species competition, inundation, and wildlife herbivory. Trees may be planted
 directly into vegetated areas, including old fields, that are not overgrown with invasive
 vegetation such as Japanese hops. Trees planted in vegetated areas should be larger
 containerized stock to ensure they can get adequate sunlight and outcompete established
 vegetation. Site preparation may include mowing and invasive species treatment.
- Tree plantings will have five 3-5 years of follow-up establishment actions including vegetative and invasive species management through herbicide application and mowing.
- Bare ground should be exposed only as much as needed (i.e., in areas of earth work, or for site preparation for planting and seeding). Native cover vegetation will be planted on disturbed bare soil in advance of tree planting to prevent establishment of invasive species or other undesirable vegetation, as well as for soil conservation best management practices (BMP).
- Site preparation may include herbicide application, disking, mowing, cover crops, and other methods to reduce invasive species competition and support survivorship of tree plantings.
- Strategic selection of flood and heat-tolerant species will be considered to support resilience.

Forest Stand Improvement (FSI): Actions to improve the vigor, composition, diversity, resilience, and quality of forest stands. FSI includes a variety of forest management actions including thinning, canopy gap creation, invasive species management, and native species planting. These actions can be prescribed to achieve a variety of project objectives such as increasing forest species and structural diversity, supporting natural regeneration of forest habitat, and reducing the establishment of invasive species. FSI also improves food sources and habitat for wildlife at the project site. FSI can include, for example, underplanting or planting in existing canopy gaps in areas with high ash density expected to be impacted by emerald ash borer.

Considerations for FSI:

- FSI management actions will be determined by existing and desired future stand conditions.
 Stand-level prescriptions will be written using data from forest inventory and stand walks conducted by USFWS and USACE foresters.
- In areas where natural recruitment of pecan is occurring, undesirable overstory species can be removed to open canopy and allow more sunlight to the understory.
- Invasive species removal and treatment is included in FSI. These actions can reduce the establishment and proliferation of invasive species throughout the study area.
- FSI will include tree planting in existing forest and canopy gaps. It is important to note that FSI planting is differentiated from the tree planting measure due to the differing requirements for site preparation, follow-up establishment, and equipment access.
- Species selection for planting will consider site elevation (Figure 17), existing and desired stand conditions, canopy cover, and invasive/vegetative species competition. Site preparation, as well as follow-up establishment measures, will be included in the prescriptions to maximize planting survivorship. This can include herbicide application, disking, mowing, and thinning.
- Planting will include containerized stock, bare roots, and cuttings. It could also include

reseeding areas of soil disturbance with native seed mixes or artificially disturbing soil in open canopy areas to promote seed catch of early successional tree species.

• Strategic selection of flood and heat-tolerant species will be considered to support resilience.

Wetland restoration: Restoration of a community of native plants within wetlands in the study area and establishing backswamp communities.

- Re-introduction of hydric plant species to swales will improve wetland habitat diversity.
- Planting of backswamp species, such as Bald Cypress and Water Tupelo, will support sitelevel diversity of vegetative communities, provide diverse resources for native wildlife, and increase resilience of forest communities to hydrologic variability.
- Appropriate plant species will vary dependent on water depth and inundation periods.
- Planting will include both containerized stock and bare roots. Larger stock will be used for species such as cypress, which are prone to wildlife disturbance.
- Strategic selection of flood- and heat-tolerant species will be considered to support resilience.
- Herbaceous plants will be planted only below a certain elevation (360 ft). Wetland species to be considered include Arrowhead (*Sagittaria* spp.) and Lobelia sp.

4.1.2 Structural Measures.

Ridge & Swale Creation (topographic diversity): Restoration of ridge and swale landforms consisting of regular, parallel ridges alternating with marshy depressions. These features were originally formed by the gradual movement of fluctuating water levels, or the shifting meanders of a river. Priority will be establishment of bottomland hard mast (including, oak-hickory, floodplain ridge, and riverfront terrace forest)

Considerations for ridge and swale restoration/creation:

- The restoration/creation of ridges will help increase topographic diversity at the study area, allowing for a greater diversity of species and habitats at different elevations. Ridges and swales will be planted in a gradient of species depending on elevation.
- Focus on excavating existing ground and placing material adjacent to the swales to form higher elevation ridges.
- Hydrology and hydraulics in the study area and historic ridge and swale topography in the study area will be considered when designing new ridges and swales
- Non-forested fields in the study area are likely candidates for the creation of new ridges and swales due to easy access and less disturbance to forest habitat.
- Ridge creation will take into consideration elevations suitable for hard mast species and reduced periods of inundation.
- In swales, species to consider for restoration/establishment include swamp species such as cypress, tupelo, nuttall oak, and water oak, which are more tolerant to longer periods of inundation. Higher elevations will target riverfront terrace and floodplain ridge forest communities, mid elevation will target wet floodplain forest, and low elevation will target swamp and wetland communities (Figure 17).
- Trees planted on ridges will be containerized stock since they have higher tolerance to inundation and vegetative competition.
- Strategic selection of flood and heat tolerant species should be considered to support resilience.

Table 7. Management measures and objectives addressed

Measure	Objective 1 - Restore floodplain forest communities	Objective 2 – Restore and enhance natural hydrologic conditions and function to the floodplain	Objective 3 – Restore and enhance the quality and diversity of wetland habitat
Tree planting in open areas	Y		
Forest Stand Improvement (FSI)	Y		
Wetland restoration	Υ		Υ
Ridge and swale creation/restoration		Y	Y

4.2 Evaluation and Screening of Measures.

Screening is the process of eliminating, based on planning criteria, measures that will not be carried forward for consideration. Criteria are derived from the specific planning study, based on the planning objectives, constraints, and the opportunities and problems of the study area. Measures are screened by the team, Sponsors, and key technical partners throughout the formulation process utilizing the four criteria of completeness, effectiveness, efficiency, and acceptability described in Policy for Conducting Civil Works Planning Studies (ER-1105-2-103).

Completeness is the extent to which the measures or alternatives provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other federal and non-federal entities. Completeness must consider the sustainability and long-term aspects of the plans and whether all resource requirements are included. Completeness does not mean that all planning objectives are fully realized, only that the required resources and actions are included to achieve the estimated benefits. The study team determined that, at this stage of the planning process, no additional investments were needed to obtain benefits, so all alternatives are considered "complete".

Effectiveness is the extent to which the measures or alternative plans contribute to achieving the planning objectives. Benefit metrics reflect the effectiveness of each alternative. Effectiveness does not mean that all planning objectives need to be addressed or fully realized. The degree of effectiveness will be used to illustrate the trade-offs between plans when compared. In order to evaluate the effectiveness of each alternative, the team relied upon Adaptive Hydraulics numerical modeling results and bathymetric survey data to assess flow diversity and bathymetric diversity for each alternative. In addition, the modeling results indicated if there was potential for longitudinal connectivity as a result for each alternative. The alternative that maximized the "removal" / repurposed materials was also considered. See Section 5 for assessment of with project conditions.

Efficiency is the extent to which a measures or alternative plan is a cost-effective means of solving the problem and achieving the objectives. Efficiency is determined through a comparison of the costs and benefits of each alternative. The CE analysis was performed by the Institute for Water Resources (IWR) planning model. The IWR Planning model was run to make the necessary calculations.

Acceptability is the workability and viability of the measure or alternative plan with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations, and public policies. Acceptability has two dimensions – implementability and satisfaction. Implementability means the extent to which the alternative is feasible from a technical, financial, and legal perspective. Satisfaction is the extent to which the plan is welcome from a political or preferential perspective.

The measures were evaluated under these four criteria, and all were found to be complete, effective, efficient, and acceptable. Therefore, none of the measures were screened.

4.3 Summary of Retained Measures.

The measures retained were:

- Tree planting in open areas
- Forest Stand Improvement (FSI)
- Wetland restoration
- Ridge and swale creation

Table 8. Summary Table of the Problems, Opportunities, Objectives, and Measures.

PROBLEMS	OPPORTUNITIES	OBJECTIVES	MEASURES
Native floodplain forest communities have severely declined in extent, diversity, and health due to changes in land cover, introduction of invasive species, physical modifications, and altered hydrology and hydraulics of the Mississippi River.	 Large-scale forest restoration in the MMRRC, which has limited federal land ownership Design for contiguous forest habitat Design with resiliency to altered hydrology and environmental regimes Design with minimal OMRR&R Establish other natural habitat types and increase species diversity (i.e. planting wet tolerant species) which may be more resilient to frequent flooding Evaluate opportunities to learn from variable forest restoration 	Primary Objective 1: Restore floodplain forest communities	Tree planting in open areas Ridge and Swale Forest Stand Improvement (FSI) Wetland Restoration

PROBLEMS	OPPORTUNITIES	OBJECTIVES	MEASURES
	actions and alternative management strategies (i.e. flood adaptive species, different planting techniques) Develop habitat types for species of interest (i.e, bats, migratory species)		
Loss of topographic diversity reduces vegetative community diversity and wildlife resources (e.g., forage, invertebrate production, nesting habitat, and resting sites).		Primary Objective 2: Restore topographic variation supporting forest and wetland communities to include	Ridge and Swale
Loss of aquatic, emergent, and backswamp vegetation has degraded the quality of wetland habitat for aquatic and terrestrial species, decreased the potential to retain sediment, and reduced water quality.	Establish other natural habitat types and increase species diversity (i.e. backswamps) which may be more resilient to frequent flooding Evaluate opportunities to learn from variable forest restoration actions and alternative management strategies (i.e. flood adaptive species, different planting techniques)	Secondary Objective*: Restore and enhance the quality and diversity of wetland and backswamp habitat.	Ridge and Swale Forest Stand Improvement (FSI) Wetland Restoration

4.4 Development of Initial Array of Alternatives

Alternative plans are a set of one or more measures functioning together to address one or more planning objectives. An initial array of alternative plans was formulated by combining retained measures. The alternatives differ in scale of each measure implemented across the

Study area, with acreage increasing across the Alternatives. Ridge and Swale construction was prioritized by USFWS because it would support bottomland hard mast reforestation efforts, along with other forest community types, while also increasing forest cover across the study area.

Alternative development is a complex and iterative process with many inputs. The PDT relied on the expertise of the team, including sponsors and agency partners, and the abundance of work already completed for the study area, including the 2004 IFR/EIS, to guide each iteration of the alternative development process.

The following initial array of alternatives was developed to achieve the study goal, objectives, and opportunities, while avoiding constraints. **Table 9** displays the acreages included in each measure for each alternative in the initial array.

Table 9. Acreage per Measure included in Initial Array of Alternatives

Alternative Number	Alternative Name	Ridges & Swales (R/S)	Tree Planting (Open areas)	FSI (including underplanting)	Wetland Restoration
1	Minimum 1		272 acres	455 acres	
2	Minimum 2	193 acres			
3	Intermediate 1	193 acres		455 acres	
4	Intermediate 2	182 acres	266 acres	455 acres	27 acres
5	Intermediate 3	213 acres	213 acres	742 acres	54 acres
6	Maximum	237 acres	211 acres	1,317 acres	163 acres

No Action Alternative: The NEPA requires Federal agencies to consider the option of no action as one of the alternatives. The No Action plan assumes no action is taken by the USACE to achieve the planning objectives and is synonymous with the FWOP condition. The No Action Plan forms the basis against which all other alternative plans are measured.

Minimum 1: The focus of this plan is forest restoration and afforestation in "low-hanging fruit" priority areas that would likely add the greatest forest habitat benefit at the lowest cost. This plan includes tree planting on accessible open areas close to roads and FSI in "priority areas" determined with USFWS (**Figure 18**).

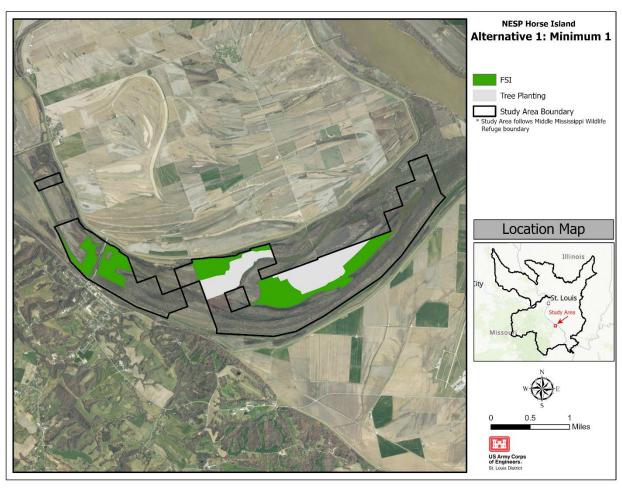


Figure 18. Minimum 1 Alternative.

Minimum 2: The focus of this plan is limited ridge and swale creation at the two easiest-to-access locations that would likely have the lowest construction costs. This plan includes ridge and swale creation/restoration on accessible locations, as well as tree planting on new ridge and swale sites and adjacent areas (**Figure 19**).

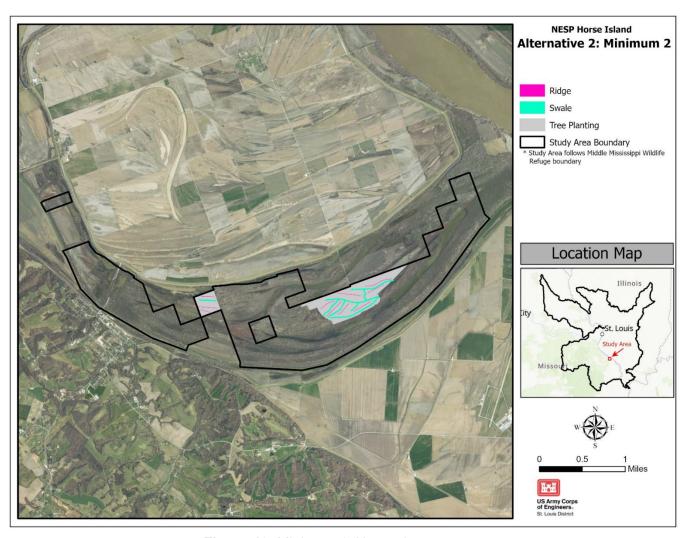


Figure 19. Minimum 2 Alternative.

Intermediate 1: The Intermediate 2 plan combines the measures from Alternative 1 and Alternative 2 in order to address study objectives 1 and 2 and capture habitat benefits from both forest restoration and topographic diversity. This plan includes ridge and swale creation/restoration on accessible locations, tree planting on new ridge and swale sites and adjacent areas, and FSI near tree planting and priority areas (**Figure 20**)...

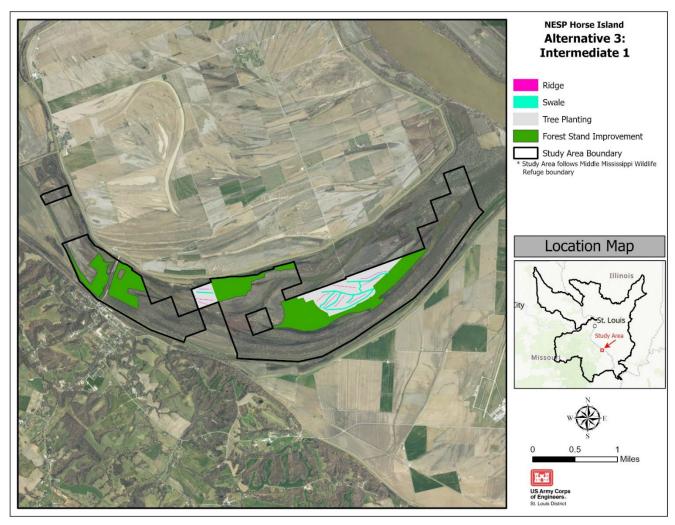


Figure 20. Intermediate 1 Alternative

Intermediate 2: The intent of this plan is to address all three study objectives at an intermediate scale, including topographic diversity, forest restoration and afforestation, and wetland restoration. This plan includes ridge and swale creation/restoration at three locations, tree planting on new ridge and swale sites and adjacent areas, FSI, and wetland restoration of three existing wetlands (**Figure 21**).

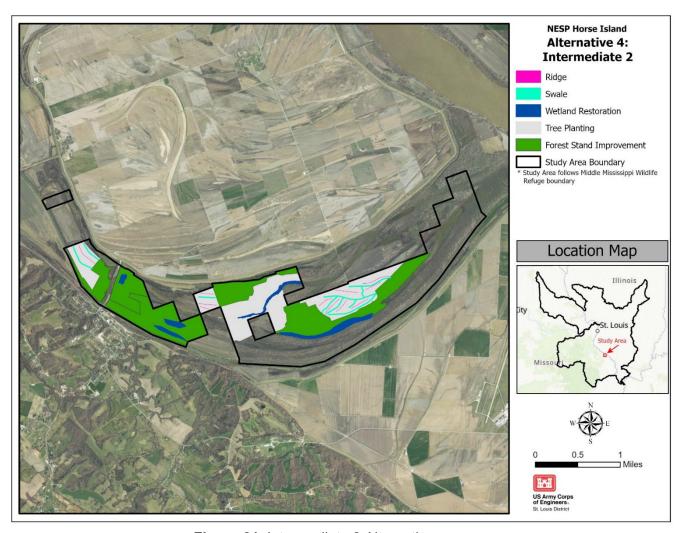


Figure 21. Intermediate 2 Alternative.

Intermediate 3: The intent of this plan is to address all three study objectives at a scale in between Intermediate 2 and the Maximum alternative, to determine if net benefits were maximized between the two alternatives (**Figure 22**).

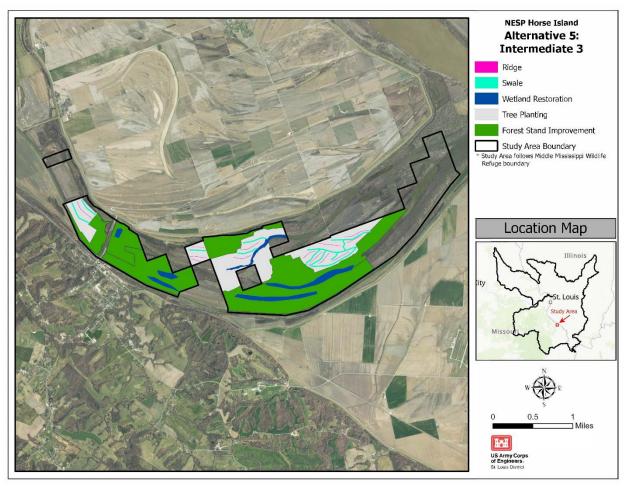


Figure 22. Intermediate 3 Alternative.

Maximum: The intent of this plan is to maximize habitat benefit across the entire study area, meeting all three study objectives to the greatest reasonable extent. This plan includes ridge and swale creation/restoration at five locations, tree planting on new ridge and swale sites and adjacent areas, FSI at all existing forested areas, and wetland restoration at all existing wetlands (**Figure 23**).

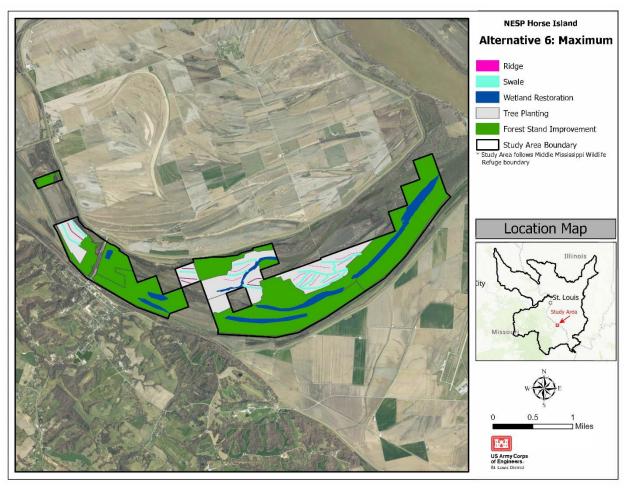


Figure 23. Maximum Alternative.

4.5 Evaluation and Screening of Alternatives

The initial array of alternatives was evaluated based on the evaluation and screening criteria described in Section 4.4: the planning objectives, constraints, opportunities, and problems of the study area; and the four criteria of completeness, effectiveness, efficiency, and acceptability described in Policy for Conducting Civil Works Planning Studies (ER-1105-2-103).

The Minimum 1 alternative was screened on the basis of ineffectiveness. The Minimum 1 alternative only meets objective 1: restore floodplain forest communities. The study team determined, in coordination with the federal Sponsor, that meeting the topographic diversity objective (objective 2) was of high importance, whereas Minimum 1 only included tree planting and FSI and thus only addressed objective 1.

The other alternatives in the initial array were found to be sufficient and worthy of further

examination and development into the final array.

4.6 Final Array of Alternatives

The alternatives below were carried forward to form the Final Array:

- No Action
- Minimum 2
- Intermediate 1
- Intermediate 2
- Intermediate 3
- Maximum

5 ASSESSMENT OF ENVIRONMENTAL CONSEQUENCES OF THE FINAL ARRAY OF ALTERNATIVES.

The following chapter describes the anticipated environmental effects (both adverse and beneficial) of the No Action Alternative and action alternatives on the resources addressed in *Chapter 3, Existing Conditions and Future Without Project Conditions*. When the analysis presented in the 2004 IFR/EIS is sufficiently comprehensive or adequate, no additional analysis is provided in this chapter.

Under the National Environmental Policy Act (NEPA), the FWOP (considered to be the No Action alternative) is necessary to provide a reference point, enabling a comparison of environmental effects of the action alternatives. The FWOP condition is the forecasted condition of the project area for the next 50 years assuming that no significant action is taken to address the resource problems identified. The base year (the year when a proposed project is expected to be operational or, in this case, when construction is complete, and benefits begin accruing) considered for this project is 2028, and period of analysis is 50 years (2028-2077). The PDT focused its evaluation on resources potentially affected by the alternatives.

The effects described in the following sections may be temporary or long-term in duration. Minor effects are typically considered negligible, while moderate adverse effects may be either avoided or counteracted by other actions that further enhance or benefit the resource. According to NEPA guidance, the meaning of significant effects varies with the context (where the action occurs) and intensity (how much damage or improvement the action causes). Non-significant effects mean there is no substantial change to the resource, while significant effects may be beneficial or adverse. The effects of the action alternatives may occur immediately because of the action (direct), occur later in time or removed in distance in response to the action (indirect), or may be reasonably expected to occur, given similar restoration actions within the UMRS (cumulative). The magnitude of the respective effects is proportional to the proposed restored acreages listed in Table 7 above

5.1 Topography and Geography.

Impacts of the No Action Alternative (Future Without Project Condition) – Over time, seasonal flooding will deposit material onto the area, particularly in existing low elevation swales. This may result in reduced topographic diversity and more shallow open water and wetland areas. Additionally, much of the project area does not have sufficient elevation to support desired hard mast tree species, limiting overall forest species and community diversity. Topographical diversity would be minorly adversely impacted by the no action. Geology would not be affected.

Impacts of the Action Alternatives – The action alternatives all include varying amounts of ridge and swale construction. Minimum 2 and Intermediate 1 include ridge and swale in two locations, Intermediate 2 includes three ridge and swale complexes, Intermediate 3 includes four complexes, and the Maximum includes five. The ridge and swale measure would increase topographic diversity across the island, increasing areas with suitable habitat for hard mast. The Maximum alternative includes the greatest amount of ridge and swale construction which would result in the greatest amount of topographic diversity across the island. Even if seasonal flood events deposit some material across the island over time, the inclusion of ridges and swales would preserve higher elevation areas. These higher elevation sites would support a greater diversity of floodplain tree species, particularly those less tolerant to long periods of inundation.

Within the planted areas, tree plantings may slow moving water and increase sedimentation rates. Topographical diversity would be substantially benefitted by the action alternatives. Geology would not be affected.

5.2 Soils and Prime Farmland.

Impacts of the No Action Alternative (Future Without Project Condition) – The conditions that prevent soils on the island from qualifying as Prime Farmland would not be met in this alternative. The existing drainages would not be altered, and the soils would remain unprotected from flooding. The soils deposited by flood events over time would likely be similar to existing soils, being typical floodplain soil types which may or may not be Prime Farmland, depending on drainage conditions. The area of Prime Farmland would be expected to be similar to existing conditions.

Impacts of the Action Alternatives – The action alternatives include soil manipulation to create the ridge and swale topography. The ridges would be constructed from soils excavated from the adjacent swales, so overall types and composition would be similar to existing conditions. After construction, the soils on the ridges may qualify as Prime Farmland because they would be elevated above most seasonal flooding events. Soils and Prime Farmland characteristics would remain similar to existing conditions.

5.3 5.3 Land Use Land Cover.

Impacts of the No Action Alternative (Future Without Project Condition) – Land uses would remain the same as existing conditions. The USFWS would continue to manage Horse Island as public land. Forested land cover may change over time due to invasive species and a decline in forest regeneration and health. Tree mortality will increase due to the Emerald Ash Borer, creating more forest canopy gaps which would likely be occupied by invasive and non-desirable species. Even-aged willow stands with little-to no understory may lose forest cover as the canopy ages and dies without a younger cohort of trees to replace it. In areas that are less affected, the land cover is likely to remain forested, albeit with a different composition of tree species. The fallow agricultural fields are expected to remain partially unforested, further transitioning into scrub-shrub and field habitat dominated by non-native weeds. Patches of early successional forest will continue to establish and increase forest cover in the fallow fields over time. The no action would not affect land use. The no action would result in a substantial, permanent adverse impact to land cover (floodplain forest).

Impacts of the Action Alternatives – In all of the action alternatives, the land uses would remain the same as existing conditions. Horse Island would remain a public area managed by the USFWS. All of the action alternatives include tree planting in areas that are currently unforested. This would change the land cover by increasing forest habitat and cover, particularly in the old fields. FSI measures would include actions such as underplanting, thinning, and invasive species treatment. These actions would prevent loss of forest cover over time, support natural regeneration of native species, increase plant community diversity, and reduce the spread of invasive species in the study area. The margins around the wetland areas would be planted, increasing backswamp forest habitat in the Intermediate 2, Intermediate 3, and Maximum alternatives. The action alternatives would not affect land use. The action alternatives would result in substantial permanent benefits to land cover (floodplain forest and wetland restoration).

5.4 Hydrology and Hydraulics.

Impacts of the No Action Alternative (Future Without Project Condition) – Hydrologic

trends in the open river show that the Horse Island area will continue to experience large fluctuations in water depth. The old main channel of the Mississippi River will likely experience slow increases in sedimentation, which would change some of the hydraulic connectivity or drainage patterns in the area. However, the study area is likely to have similar hydrology to existing conditions. The no action will have no effect on hydrology.

Impacts of the Action Alternatives – Hydrologic trends in the open river show that the Horse Island area will continue to experience large fluctuations in water depth. The old main channel of the Mississippi River will likely experience slow increases in sedimentation, which would change some of the hydraulic connectivity or drainage patterns in the area. Increased tree density in the project is likely to slow moving water in the tree planting areas, which may increase sedimentation rates. All action alternatives create some topographic changes. These topographic changes are not expected to have significant impacts on the hydrology and hydraulics of the area, but they will have localized effects on the movement (and ponding) of water. Overall, the action alternatives would have minor neutral effects on hydraulics and hydrology.

5.5 Noise.

Impacts of the No Action Alternative (Future Without Project Condition) – Existing noise levels would not change from current conditions. Noise concerns would not be impacted by the No Action alternative.

Impacts of the Action Alternatives – The tree planting measure may require the use of vehicles, skid steers, and a soil augur. The ridge and swale construction would create noise as heavy equipment excavates swales and shapes the material into the ridges. The Maximum alternative has the greatest area of both ridge and swale and tree planting and would therefore be expected to create the greatest temporary noise impact. All of the action alternatives would create temporary minor adverse noise impacts during construction activities.

5.6 Air Quality

Impacts of the No Action Alternative (Future Without Project Condition) – The no action will have no effect on air quality.

Impacts of the Action Alternatives –The expected emission sources will be quantities of unleaded and diesel fuel used during construction. After the tree plantings become established, they will serve as a carbon sink. All of the action alternatives would contribute some amount of particulates and emissions during construction and tree planting activities, but these impacts would be temporary and minor. The Minimum 2, Intermediate 1, Intermediate 2, and Intermediate 3 alternatives would have a moderate amount of impact, while the Maximum alternative would cause the greatest emission impacts. Alternatives with ridge and swale construction could drive particulates into the air during construction, but these impacts would be temporary and minor through the use of best management practices to reduce dust and particulate transport. The action alternatives would have temporary minor adverse impacts during construction, but the tree plantings would create a minor permanent benefit by serving as a carbon sink.

5.7 Water Quality

Impacts of the No Action Alternative (Future Without Project Condition) – The No Action would not involve any impacts to Waters of the United States. There would be no soil disturbance. Section 401, 402, and 404 compliance is not applicable. Water quality would likely remain the same as in the existing condition.

Impacts of the Action Alternatives – None of the action alternatives would add dredged or fill material to a Water of the United States. The action alternatives with ridge and swale construction may create a risk of sediment pollution if large precipitation events transport soil from construction areas to adjacent waterbodies. However, the areas of soil disturbance would be revegetated following construction and all best management practices to reduce sedimentation pollution would be implemented. Adverse sedimentation impacts are expected to be temporary and minor. The proposed action alternatives will result in a net improvement to the impacted aquatic habitats. Therefore, the work would meet the qualifications for the Nationwide (NWP) 27 for Aquatic Habitat Restoration, Enhancement, and Establishment Activities (Appendix L).

5.8 Resiliency

Impacts of the No Action Alternative (Future Without Project Condition) – An assessment of resiliency in the project's region and watershed was conducted to identify the potential changes in weather and hydrology that may occur in the project's life cycle. This assessment is attached in Appendix I. Taking no action would have no effect on resiliency.

Impacts of the Action Alternatives – Proposed measures for this project would have minimal effect on the changing weather patterns, but the additional trees would sequester carbon. However, future changes in weather may pose a minimal risk to the effectiveness and function of project features. A qualitative risk assessment of how impacts to resiliency may affect project features is included in Appendix I.

5.9 Hazardous, Toxic, and Radioactive Waste Impacts of the No Action Alternative (Future Without Project Condition) – The HTRW concerns in the project area would remain the same as existing conditions.

Impacts of the Action Alternatives – The Phase 1 Assessment did not identify any major sites of interest which pose significant HTRW concerns. Therefore, the action alternatives would not disturb any known HTRW sites. The action alternatives would have no effect on HTRW concerns.

5.10 Aquatic Habitat/Fish

Impacts of the No Action Alternative (Future Without Project Condition) – No actions would be taken that would effect a change to the aquatic habitats in the area. Fish would still have access to the open water areas on the island. Some natural amount of sedimentation is expected in the old channel of the Mississippi River. This sedimentation input would be the primary change in the FWOP condition. The no action would have minor adverse impact to the aquatic habitat.

Impacts of the Action Alternatives – The proposed action alternatives would not alter the aquatic habitats adjacent to the study area. The old and main channels of the Mississippi River would remain similar to existing conditions. However, during construction, it is possible that the areas of soil disturbance created during ridge and swale construction may deliver erosional sediments into the adjacent waterbodies after large rain events. Best management practices would be implemented to reduce sedimentation pollution risk to the old and main channel of the Mississippi River. This sedimentation pollution may cause temporary minor adverse impact to aquatic species occurring in the old channel and the main channel of the Mississippi River. Any low-water crossing features would be temporary and the soil and substrate would be restored following construction. The action alternatives would have temporary minor adverse impacts in

the form of sedimentation, but overall would result in substantial permanent benefits.

5.11 Terrestrial Habitat/Wildlife

Impacts of the No Action Alternative (Future Without Project Condition) – Existing threats for forest health would persist and become worse in the No Action. Regeneration of native tree species would continue to decline. The lower elevation stands where hard mast trees cannot survive would likely remain dominated by willows, similar to existing conditions. The old fields on the island may have some increased coverage of early successional species like eastern cottonwood but could also have a much greater invasive vegetation component. Additionally, lack of natural regeneration in forested stands will result in loss of forest cover over time as mature trees die without another cohort of trees to replace them. Based on the presence of Japanese hops, bur cucumber, and other highly invasive and weedy species, it is likely that gaps created by tree mortality will be overtaken by these species, preventing the natural succession of forest that would otherwise occur. Any wildlife that rely on healthy floodplain forest habitats, including migratory birds, would be permanently adversely affected in the FWOP condition.

Impacts of the Action Alternatives - All of the action alternatives include measures that will improve the quality of terrestrial habitat at Horse Island for wildlife. All action alternatives include a component of planting native trees and vegetation, which will increase species diversity, particularly of hard mast trees that are currently minimally represented throughout the project area. This action would also increase forest cover and habitat diversity in old fields, which are currently dominated by weedy annuals that provide little wildlife benefit. FSI activities will also increase forest diversity, especially in even-aged monotypic willow stands found throughout Horse Island. FSI activities will promote natural regeneration of native trees and shrubs, improve forest structural diversity through silvicultural activities, treat invasive species that are outcompeting native vegetation, and increase forest community diversity through tree and shrub plantings. The Intermediate 2 and Maximum alternatives also include enhancement of wetland and backswamp habitat. These activities will increase habitat quality and diversity, and provide greater habitat benefits for a broader range of wildlife species. Additionally, all action alternatives except Minimum 1 include ridge and swale creation on old fields. This activity will support the long-term establishment of hard mast trees on Horse Island by creating high elevation areas that will have less inundation throughout the year, thus supporting the survivorship of less flood tolerant tree species. Wildlife that depend on healthy floodplain forest communities, including migratory birds, would be benefited by the restoration of floodplain forest on Horse Island. Overall, the action alternatives would result in substantial permanent benefit.

5.12 Biological Assessment.

5.12.1 Federally Listed Species.

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, an updated list of species and critical habitats potentially occurring in the vicinity of the proposed work areas was acquired from the USFWS Information for Planning and Conservation (IPaC) website at (https://ecos.fws.gov/ipac/) on 7 March 2025 (Project Code: 2023-0128121). There are no designated Critical Habitat locations in the project area. Habitat requirements and impacts of the proposed action are discussed for each listed species. The species included in the IPaC are Indiana bat, tricolored bat, pallid sturgeon, and monarch butterfly (Table 8).

Table 10. List of federally threatened and endangered species and habitat potentially occurring in the vicinity of the proposed project, acquired from the USFWS Information for Planning and

Conservation (IPaC) website.

Common Name (Scientific Name)	Classification	Habitat
Indiana Bat (<i>Myotis sodalis</i>)	Endangered	Uses caves and mines for winter hibernacula; uses trees for summer roosting. Forages along small stream corridors with well-developed riparian woods and in upland forests.
Tricolored bat (Perimyotis subflavus)	Proposed Endangered	In summer, roosts in structures, trees, cliffs, and caves. In winter, hibernates in caves.
Pallid Sturgeon (Scaphirhynchus albus)	Endangered	Large, deep, turbid river channels, usually in strong current over firm sand or gravel.
Monarch Butterfly (Danaus plexippus)	Candidate	Uses milkweed plants as a reproductive host. Found in open grassy areas with milkweed.

Ecology of the federally-listed species:

Indiana bat: During late fall and winter, Indiana bats hibernate in caves and mines. During the spring and summer, Indiana bats roost in trees. Suitable roosting trees can be alive or dead, but all would have loose, exfoliating bark, holes, and other damage that can be used by a roosting bat. These damages allow bats to crawl inside and be sheltered from predators and weather. Indiana bat roost trees are typically at least 5 inches diameter at breast height (dbh) with suitable roosting characteristics (U.S. Fish & Wildlife Service, 2022). Preferred roost sites are in forest openings, at the forest edge, or where the overstory canopy allows some sunlight exposure to the roost tree, which is usually within one km (0.6 mi.) of water. Indiana bats forage for flying insects (particularly moths) in and around the tree canopy of floodplain, riparian, and upland forests. The most significant threat facing Indiana bat populations today is white-nose syndrome (WNS), a fungal disease. Other major range wide threats to the Indiana bat include habitat loss/degradation, forest fragmentation, winter disturbance, and environmental contaminants.

Tricolored bat: Tricolored bats were formerly called Eastern Pipistrelle. Tricolored bats are usually found roosting singly, only sometimes in pair or clusters of up to a dozen individuals (Missouri Department of Conservation, 2022). In winter, Tricolored bats hibernate in caves. They prefer caves that are humid and warm. In summer, they leave their hibernation caves and roost in trees amongst dead leaves, in crevices in cliffsides, and in human-made structures. They also sometimes roost in caves during summer. Tricolored bats forage for insects high in the air along forest edge and the boundary of streams or open bodies of water. Tricolored bats mate during spring, fall, and sometimes in the winter. Maternity colonies begin forming in mid-April and females bear one to two pups by late May to mid-July.

Pallid sturgeon: Pallid sturgeon are a large fish with a characteristic flattened shovel-shaped snout that occur along the bottom of the Missouri and Mississippi Rivers. The species' historical range included Arkansas, Illinois, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, North Dakota, South Dakota, Tennessee, Wyoming (U.S. Fish & Wildlife Service, 2025). This fish requires a wide diversity of river and floodplain habitats including backwaters, chutes, sloughs, islands, sandbars, and main channel waters to complete its life

history. Pallid sturgeon are bottom dwelling fish that prefer areas of strong current that have firm sand substrates in the main river channels, such as along sand bars and behind wing dikes with deeply scoured trenches. Compared to the shovelnose sturgeon, the pallid sturgeon is restricted to areas of strong current (U.S. Fish & Wildlife Service, 2025). Restoration efforts include captive breeding and restocking of juveniles, habitat preservation: not altering channel island tips; avoiding channel alterations that limit or eliminate shallow, sloping bank habitat; and prohibiting new dams and impoundments, which further reduce habitat. Conservation concerns include the consequences of historical overharvest, dam construction, hybridization with shovelnose sturgeon, and habitat loss/fragmentation (Missouri Department of Conservation, 2025).

Monarch butterfly: The Monarch Butterfly is a large orange butterfly that is a candidate for listing on the Endangered Species List. Monarch populations of eastern North America have declined 90%. Much of the monarch butterfly's life is spent migrating between Canada, Mexico, and the U.S. Monarchs do not overwinter in Illinois or Missouri. The Monarch occurs in a variety of habitats where it searches for its host plant, milkweed. Of the over 100 species of milkweed that exist in North America, only about one fourth of them are known to be important host plants for monarch butterflies (Kaul & Wilsey, 2019). Three factors appear most important to explain the decline of Monarchs: loss of milkweed breeding habitat, logging at overwintering sites, and change weather conditions and extreme weather. In addition, natural enemies such as diseases, predators, and parasites, as well as insecticides used in agricultural areas may also contribute to the decline (United States Forest Service, 2021).

<u>Impacts to federally-listed species and effects determinations:</u>

Impacts of the No Action Alternative (Future Without Project Condition) – The floodplain forest would continue to decline in health, adversely impacting forest bat species that rely on this habitat for foraging and roosting. The reduction in native trees from natural mortality and lack of regeneration would reduce the amount of potential roost trees. As the understory becomes filled with invasives, clear foraging routes would become blocked. Pallid sturgeon status is likely to remain similar to existing conditions in the FWOP condition because this condition would not alter the river habitat adjacent to the study area. The status of monarch butterflies in the study area is likely to be adversely impacted if the spread of invasive species limits the available nectar sources in the old field areas.

Impacts of the Action Alternatives – Each of the action alternatives will improve the quality of floodplain forest habitat, which will provide substantial permanent benefits to forest bat species. The FSI activities would improve existing forested areas by reducing the presence of invasive species, increasing native tree regeneration, and creating a desirable composition of floodplain tree species in these forested areas. Each of the action alternatives would include some amount of FSI and some amount of tree planting in currently unforested areas. The action alternatives that include ridge and swale would provide further benefits by allowing a more diverse array of tree species based on the new elevations created by the ridge construction. The ridges would also reduce the mortality from seasonal flood events by raising the plantings above inundation. The improved diversity of tree species and beneficial use of topographic diversity would increase the resiliency of the floodplain forest to future flood events. The action alternatives would aim to reforest some old fields, which would reduce the area of habitat for the monarch butterfly. However, existing old field habitat is only marginal, and milkweed populations would be rare to nonexistent. However, there would be some nectar sources in the old field areas that could be used by migrating adults. In addition, the cover crop used to revegetate areas of soil

disturbance would include nectar sources for monarchs and other pollinators, providing a long-term benefit to monarchs migrating through the area.

Should the Maximum Alternative be implemented, the St. Louis District would make the following effects determinations for the listed species:

Indiana bat: May affect, not likely to adversely affect (<u>NLAA</u>). Construction of the ridge & swale habitat would cause minor, temporary adverse impact in the form of vibration and noise during the day when bats would be roosting nearby. The implementation of the Maximum Alternative would provide substantial long-term benefit to Indiana bat by increasing the area of and quality of suitable habitat.

Tricolored bat: <u>NLAA</u>. Like the Indiana bat, tricolored bats roosting near the areas of ridge & swale construction may experience temporary, minor adverse impact via noise and vibration. However, the Maximum Alternative's improvements to the area and quality of floodplain forest habitat would provide substantial long-term benefits to tricolored bat.

Pallid sturgeon: No Effect. The work would occur in upland areas so adverse impacts resulting from sedimentation pollution from the soil disturbance caused during construction would be unlikely. Best management practices would be used to reduce the risk of sediment pollution from entering the Mississippi River. Sedimentation risk impacts would be temporary. Following construction, the areas of disturbed soil will be restored with quick-growing grass and further anchored with the proposed tree plantings.

Monarch butterfly: <u>NLAA</u>. Individuals migrating through the area may be impacted by the construction disturbance caused during ridge & swale creation. The conversion of the marginal old field habitats to floodplain forest may cause additional impacts. However, areas of soil disturbance would be revegetated with a seed mix that includes nectar sources, which would provide benefit until the canopy closes over the planted areas.

5.12.2 State Listed Species.

An EcoCAT report (#2507668) was generated for Horse Island on 17 December 2024 from the Illinois Department of Natural Resources website (https://dnr2.illinois.gov/EcoPublic/). The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location: Mississippi River - Mudds Landing Illinois Natural Area Inventory (INAI) Site. The INAI was established in 1978 to identify and document natural areas with conditions that reflect the areas' historical composition. The INAI is a collection of ecological information on natural areas evaluated to have statewide conservation significance. These areas allow for the preservation biodiversity (Illinois Department of Natural Resources, 2024). No other natural areas or state-listed species were included in the report.

Impacts of the No Action Alternative (Future Without Project Condition) – The Mudds Landing INAI site does not overlap with Horse Island. It will not be adversely impacted in the FWOP condition. The condition of this site over time would be unrelated to conditions at Horse Island.

Impacts of the Action Alternatives – The Mudds Landing INAI site does not occur on Horse Island, and it would not be adversely impacted by any of the action alternatives. The condition of this site over time would be unrelated to conditions at Horse Island.

5.13 Invasive Species.

Impacts of the No Action Alternative (Future Without Project Condition) – It is anticipated that existing invasive species identified in the study area will continue to establish and proliferate, especially in disturbed areas such as canopy gaps. As EAB continues to cause high mortality of green ash, it is expected that Japanese hops and other non-desirable species will colonize these gaps. While some invasive species management is expected to be conducted on the island, it will be very limited in extent. Bighead and silver carp will continue to occur in the wetland sloughs following high water events. Invasive species concerns would adversely impact habitat quality and native species diversity in the No Action.

Impacts of the Action Alternatives – All alternatives will include varying levels of invasive species management as part of measure implementation. FSI will include invasive species management to reduce the extent and spread of invasive species in forested stands through actions such as herbicide application, planting, and mechanical removal. Tree planting and soil disturbance associated with ridge and swale creation will have additional invasive species management actions as part of site preparation and tree establishment. Mowing and spraying to reduce invasive competition are included in the Operation and Maintenance (O&M) of each of the action alternatives as well as in the Monitoring and Adaptive Management Plan. As in the No Action, bighead and silver carp will continue to occur in the wetland sloughs following high water events and would not be affected by any of the action alternatives. Terrestrial invasive species concerns would be substantially benefitted by each of the action alternatives.

5.14 Historical and Cultural Resources.

Impacts of the No Action Alternative (Future Without Project Condition) – In the FWOP condition, continued sedimentation would bury and protect any unknown cultural resources.

Impacts of the Action Alternatives – A review of historic maps indicate that the study area was part of the Mississippi River channel until the end of the 19th century/beginning of the 20th century. Significant land accretion within the study area did not take place until 1908 and historic atlases and maps indicate no buildings were within the study area. The St. Louis District consulted with the Illinois SHPO and consulting Tribal Nations, providing a determination that the no historic properties will be affected by the action alternatives. The SHPO and two Tribal Nations responded to the St. Louis District's request to consult and concurred with St. Louis District's determination. There is a low likelihood of historic properties in the study area, so the action alternatives would have no impact. The NESP-UMRR Cultural Programmatic Agreement (PA), which this study is covered under, outlines the process in the unlikely event a historic property(ies) is identified during construction. See Appendix J for the full PA. The Section 106 process has been met.

5.15 Socioeconomics.

Impacts of the No Action Alternative (Future Without Project Condition) – The FWOP condition would not create adverse socioeconomic impacts to the local economy or population.

Impacts of the Action Alternatives – The impact of the action alternatives to aesthetics, recreation, and local communities are discussed below.

5.15.1 Aesthetics

The aesthetics of the island are typical of the rural floodplain. The island is a mix of different habitats interspersed with some agricultural fields. Only a narrow band of the Mississippi Riverbank exists on the far eastern boundary of the area, but the old channel forms the

southern boundary.

Impacts of the No Action Alternative (Future Without Project Condition) – The aesthetics of the island would remain similar to existing conditions. While the degradation of the floodplain forest community would cause ecological impacts, it may not cause aesthetic impacts. The site will remain forested, though the composition and age of trees may be less healthy or desirable from an ecological perspective. The area aesthetically would remain as a forested floodplain island.

Impacts of the Action Alternatives – The aesthetic of the island would change to be more forested in each of the action alternatives. Whether a more forested floodplain island represents a benefit to the island's aesthetic is subjective, however. During the ridge and swale construction, soil disturbance would create temporary minor adverse impacts to aesthetics until the soil is restored with a cover crop and/or planted trees become established.

5.15.2 Recreation.

Currently, the Horse Island study area is open to several recreational opportunities including hiking, fishing, bird watching, and limited hunting.

Impacts of the No Action Alternative (Future Without Project Condition) – Current recreational opportunities would still be offered and are likely to be similar to existing conditions into the future.

Impacts of the Action Alternatives – As in the No Action, the current recreational opportunities would still be offered into the future. However, during implementation of the action alternatives, some recreational opportunities may be disrupted for public safety. Following construction, these temporary minor impacts would cease.

5.15.3 Local Communities/At Risk Communities.

Impacts of the No Action Alternative (Future Without Project Condition) – The study area does not contain any human communities, and adjacent communities are not at risk for environmental, socioeconomic, or demographic impacts. There would be no adverse impacts to local communities in the No Action alternative.

Impacts of the Action Alternatives – There are no permanent residents on the island that may be impacted during implementation of the action alternatives. There would be no adverse impacts to local communities under the action alternatives.

5.16 Cumulative Effects.

The CEQ regulations (40 CFR §§ 1500–1508) implementing the procedural provisions of NEPA, as amended (42 USC § 4321 et seq.) define cumulative effect as:

"...which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 508.1(g)(3))

Cumulative effects analysis recognizes that the most serious environmental impacts may result from the combination of individually minor effects of multiple actions over time, rather than the

direct or indirect effects of a particular action.

Analyzing cumulative effects requires identifying the environmentally relevant area and the past, present, and future actions in that area that would contribute incrementally to the overall effect. The environmentally relevant area is determined by both location and time. Future actions are those that are reasonably likely to occur. A future project is only considered in this analysis if there is sufficient information on the project to understand what its incremental contribution to cumulative effects might be.

The 2004 IFR/EIS (Chapter 9-Cumulative Effects) contains detailed identification of other past, present, and future actions throughout the UMR.

5.16.1 Past, Present, and Future Projects.

River-based and floodplain projects are discussed in Section 1.6 of this report - Prior Reports, Existing Water Projects, and ongoing Programs. In addition to USACE, other entities also construct and operate projects in the Mississippi River corridor.

5.16.2 Cumulative Effects Assessment.

The 2004 IFR/EIS (Chapter 9-Cumulative Effects) contains a comprehensive analysis of cumulative effects associated with the NESP and other past, present, and reasonably foreseeable actions. The open river past, present and future actions identified above are consistent with that analysis, which remains valid. Cumulative effects are not meaningfully different than analyzed in the 2004 IFR/EIS. Area-specific cumulative effects are summarized below where relevant. The environmental consequences outlined below are organized by the resource categories discussed for the project in Chapter 5.

There are no area-specific adverse cumulative effects anticipated as a result of the proposed NESP project. Conversely, this NESP ecosystem restoration project reduces the negative cumulative impacts that have occurred because of a lack of floodplain forest restoration efforts in the region which are reducing forest health, increasing habitat fragmentation, and adversely impacting the biological resources dependent on these habitats. The proposed action alternatives would cause permanent cumulative benefits to physical and biological resources. Socioeconomic resources would not experience cumulative adverse or beneficial impacts.

Table 14 summarizes the cumulative effects of the NESP Horse Island Project.

Table 11. Summary of the cumulative effects of the "No Action" and the final array of action alternatives to physical, biological, and socioeconomic resources.

_	mpar	Altern ed to E Effects	xistir	ng Co	onditi		Symbols: X = Long-Term Effect T = Temporary Effect C = Cumulative Impact	_	Proposed Alternatives, Effects of Action Alternatives to No Action Effects (Effects of Project)					
ВЕ	NEFI	CIAL		Α	DVER	SE		BEN	NEFICI	AL		Α	DVER	SE
SIGNIFICANT	SUBSTANTIAL	MINOR	NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT	Affected Resource	SIGNIFICANT	SIGNIFICANT SUBSTANTIAL MINOR		NO EFFECT	MINOR	SUBSTANTIAL	SIGNIFICANT
							A. Physical Effects							
					Χ		Topography, Geology, & Soils		Χ					
			Х				Land Use/Land Cover				Х			
			Χ				Prime Farmland			Χ				
			Х				Noise				Χ			
			X				Water Quality				X			
			X				Hydraulics & Hydrology				X			
			X				Air Quality				X			
			X				Resiliency				X			
			Х				Hazardous Waste				Х			
							B. Biological Effects							
			Χ				Aquatic Habitat				Χ			
			V		Х		Terrestrial Habitat		Х		V			
			Х		V		Bald Eagle		V		Х			
					X		Migratory Birds		X					
					X		Invasive Species		X					
					X		State-listed Species		X					
					Λ		Federally-listed Species		٨					
			V				B. Social Effects				V			
			X				Economics Aesthetics				X			
			X				Recreation				X			
			X				Cultural Resources, Historic				X			
			Х				Tribal Resources				Χ			

6 EVALUATION AND COMPARISON OF FINAL ARRAY OF ALTERNATIVES 6.1 Evaluation of Final Array of Alternatives.

This chapter describes the final array of alternatives evaluated. It also documents the process used to determine the potential costs and habitat of each alternative and compares those costs and benefits against each other.

Economic, social, and environmental benefits, impacts, and costs are to be identified, measured, and/or qualitatively characterized using the four Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) accounts (ER 1105-2-103, Section 1-6) listed below:

- National Economic Development (NED) account displays changes in the economic value of the national output of goods and services.
- Environmental Quality (EQ) account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of aquatic ecosystem restoration plans. Increases (or decreases) in the net quantity and/or quality of desired ecosystem resources are referred to as National Ecosystem Restoration (NER) benefits or impacts.
- Regional Economic Development (RED) account displays changes in the distribution of regional economic activity (for example, income and employment).
- Other Social Effects (OSE) account displays plan effects on social aspects such as community resilience, public health, life safety, displacement, energy conservation, and similar effects.

Taken together, the concepts behind the four P&G accounts contribute to a structured planning framework for evaluating and comparing alternatives.

6.1.1 Cost Estimates.

Parametric or rough cost estimates for alternative comparison were prepared using October 2024 (FY2025) price levels; annualized costs include construction costs, contingency costs, interest during construction, monitoring and adaptive management costs, and O&M costs. All project measures are on Federal lands; consequently, there are no lands and damages or relocation costs. Project costs used in the CE/ICA were annualized based on the Fiscal Year discount rate of 3.0% and a 50-year period of analysis. Interest During Construction (IDC) was calculated using middle of year compounding based on a two-year period of construction, using the Fiscal Year 2025 discount rate of 3.0%. **Table 15** shows the estimated cost of Project alternatives as of completion of the habitat analysis and for use in the comparison of alternatives (prior to selection, refinement, and developing a detailed cost estimate of the selected plan.

 Table 12. Cost Estimates (October 2024 Price Level)

Name of Alternative	First Cost	Interest During Construction	Average Annual Construction	Average Annual O&M	Average Annual M&AM	Average Annual Cost
No Action	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Min 2	\$13,117,000	\$394,986	\$525,150	\$2,848	\$6,580	\$534,578
Int 1	\$14,536,000	\$437,715	\$581,961	\$4,916	\$13,309	\$600,187
Int 2	\$15,552,000	\$468,310	\$622,637	\$9,455	\$24,811	\$656,903
Int 3	\$18,659,000	\$561,869	\$747,029	\$10,864	\$29,406	\$787,299
Max	\$21,136,000	\$636,458	\$846,197	\$13,043	\$36,536	\$895,777

Note: Costs are shown at the 2025 price level and were annualized using the current FY25 Federal discount rate of 3.0 percent over a 50-year period of analysis.

6.1.2 Habitat Benefits.

This assessment includes a summary of the existing biological conditions used in the evaluation, as well as a forecast for future conditions under the No Action Alternative and each potential Project alternative. The evaluation was conducted by a multi-agency team that included representatives from the District and Project partners. Aquatic and floodplain benefits were quantified using the Habitat Evaluation Procedures (HEP; USFWS 1980a), a habitat-based evaluation methodology used in project planning. The procedure documents the quality and quantity of available habitat for selected wildlife species. The HEP assume that habitat for selected wildlife species can be described by a Habitat Suitability Index (HSI). This index value (from 0.0 to 1.0) is multiplied by the area of applicable habitat to obtain Habitat Units (HUs).

Changes in HUs will occur as a habitat matures naturally or is influenced by development. These changes influence the cumulative HUs derived over the period of analysis (50 years). HUs are calculated for select target years and annualized using the IWR Planning Suite II tool annualizer over the period of analysis to derive a net Average Annual Habitat Unit (AAHU) quantity. By using target years, AAHUs were annualized using a linear interpolation approach, essentially drawing a straight line between target years, and then calculating the area under the curve for the resulting planning horizon benefit curve. Resulting net AAHUs are used as the output measurement to compare alternatives for the proposed Project.

The PDT used two USACE-approved habitat evaluation methodologies in their analyses:

- HSI model #1 Floodplain Forest Model
- HSI model #2 Yellow Warbler Model

The floodplain forest model was used to evaluate the forest community response to the proposed forest stand improvement, tree planting, and topographical changes via ridge and swale. The floodplain forest model does not evaluate changes to wetland habitats like those that will be impacted by the proposed wetland restoration measures, so the yellow warbler model was also used. A summary of the habitat analysis is provided in **Table 13**; additional details are provided in Appendix C – Habitat Evaluation.

Table 13. Habitat Types and Areas Evaluated for This Assessment

Habitat Type	Evaluation Area	Area (acres)	Habitat Suitability Index Model
Floodplain Forest	Tree Planting with R&S	237	Floodplain Forest Model
Floodplain Forest	Tree Planting no R&S	211	Floodplain Forest Model
Floodplain Forest	Forest Stand Improvement	1317	Floodplain Forest Model
Freshwater Wetland (backswamp)	Wetland Restoration	163	Yellow Warbler Model
TOTAL		1928	

Table 14 summarizes the benefits for each alternative to be carried forward for cost effectiveness and incremental cost analysis (CE/ICA). Complete documentation of the habitat benefits analysis is provided in Appendix C – Habitat Evaluation.

Table 14. Environmental Outputs

Alternative Number/Letter	Alternative Name	Alternative Name Area (acres) Total AAHU		Net AAHU
1	Minimum 1	727	455.8	259.5
2	Minimum 2	193	120.5	90.8
3	Intermediate 1	648	434.3	250.1
4	Intermediate 2	581.9	350.4	350.4
5	Intermediate 3	1275	814.6	472.9
6	Maximum	1928	1259.7	695.2

6.1.3 Comprehensive Benefits

The Corps is required to comprehensively evaluate and provide a complete accounting, consideration, and documentation of the total benefits of alternatives a full array of benefit categories including national economic development, regional economic development, environmental quality (including national ecosystem restoration), and other social effects (ER1105-2-103, Section 1-6). Alternatives are assessed to determine if they have net benefits in total and by type. Judgement was done in collaboration with non-federal partners and in consideration of other study interests and stakeholders, using available data, analysis, input from peer review, and professional judgment. For this comprehensive benefit analysis, the final array of alternatives was evaluated. This evaluation is summarized at the end of Section 6.2 in **Table 19**. As documented below, the Maximum alternative maximizes net total benefits across all benefit categories and net benefits consistent with the study's purpose.

Review of the four formulation criteria suggested by the P&G (completeness, effectiveness, efficiency, and acceptability) described in Section 4.2 and resource significance (institutional, public, and technical) were used to aid in the selection of a TSP.

6.1.4 National Economic Development (NED) Account

The national economic development (NED) account displays changes in the economic value of the national output of goods and services. The No-Action Alternative would result in no project expenditure and would have no positive or negative impact on national output of goods and services. The minimum 2, Intermediate 1, Intermediate 2, and Intermediate 3 alternatives provide similar economic benefits in terms of value added based on the RECONS results. The Intermediate 3 and Maximum alternatives provide similar economic benefits to each other as well. Because this is an ecosystem restoration project, a NED account is not required to be identified.

6.1.5 Regional Economic Development (RED) Account

The RED account registers changes in the distribution of regional economic activity that result from each alternative plan. Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output, and population. USACE and Michigan State University have developed a regional economic impact modeling tool, RECONS (Regional ECONomic System), that provides estimates of jobs and other economic measures such as labor income, value added, and sales that are supported by USACE programs, projects, and activities. The RECONS model was run for the final array of action alternatives. As the costs of action alternatives varied, regional benefits would also vary. However, the percentage of Federal expenditure to regional benefits would be largely equivalent and not useful as criteria

for comparison.

The No Action alternative would result in no project expenditure associated and would have no positive or negative regional impact. **Table 15** shows a comparison of local impacts for all alternatives. See Appendix G - Economics for the full RECONS Analysis.

Table 15. RECONS Results – Local Total Impact for Final Array of Action Alternatives (2025 Price Level)

Total Impact (Local)	Local Capture	Output	Jobs*	Labor Income	Value Added
Minimum 2	\$8,660,000	\$12,333,000	106.4	\$6,499,000	\$6,517,000
Intermediate 1	\$9,597,000	\$13,668,000	118.0	\$7,202,000	\$7,222,000
Intermediate 2	\$10,268,000	\$14,623,000	126.2	\$7,706,000	\$7,727,000
Intermediate 3	\$12,319,000	\$17,544,000	151.4	\$9,245,000	\$9,271,000
Maximum	\$13,955,000	\$19,873,000	171.5	\$10,472,000	\$10,501,000

Numbers rounded to the nearest \$1,000

6.1.6 Environmental Quality (EQ) Account

The Environmental Quality (EQ) accounts for non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of ecosystem restoration plans. The USACE's objective in ecosystem restoration is to contribute to national ecosystem restoration (NER) via increases in the net quantity and/or quality of desired ecosystem resources. Contributions to national ecosystem restoration, or NER outputs, are increases in the net quantity and/or quality of desired ecosystem resources. The credit for the EQ account is the quantified benefits resulting from the project (AAHUs). Intangible and or non-quantifiable environmental benefits associated with the alternatives are assumed to increase proportionally relative to the AAHU outputs associated with each alternative. As a result of the project, positive effects on both the quality and extent of wildlife habitats would be expected.

For ecosystem restoration projects such as this one, contributions to the EQ account are detailed both through NEPA compliance and through calculation of net ecosystem benefits. Here, NEPA compliance is achieved by integrating an EA into this feasibility report, with a qualitative summary of environmental effects detailed in Section 7 of this report. A calculation of net ecosystem benefits was completed through the use of HEP, and the application of HSI models. The quantitative results of the evaluation are contained in Appendix C – Habitat Evaluation. Other contributions to the EQ account, such as forest contiguity, learning opportunities related to ridges and swales, and adaptive management, are discussed in Section 6.2.2.

6.1.6.1 National Ecosystem Restoration (NER) Plan

The USACE's objective in ecosystem restoration is to contribute to NER via increases in the net quantity and/or quality of desired ecosystem resources. Contributions to national ecosystem restoration, NER outputs, are increases in the net quantity and/or quality of desired ecosystem resources.

The NER plan identifies quantified habitat benefits against project costs to determine cost per AAHU; this is determined via alternatives found to be a Best Buy under the Cost Effectiveness Incremental Cost Analysis (CE/ICA) as described in the Section. The NER plan is the alternative

^{*} Jobs are presented in full-time equivalence

plan that reasonably maximizes ecosystem restoration benefits compared to cost.

Based on the cost benefit analysis shown in Section 6.2, the PDT identified the Maximum Alternative as the NER Plan as it reasonably maximizes the average annual cost per habitat unit benefits over the 50-year period of analysis over the other alternatives.

6.1.7 Other Social Effects (OSE) Account

The Other Social Effects (OSE) account addresses plan effects from perspectives that are relevant to the planning process but are not reflected in the other three accounts. Per the recent Policy Directive "Comprehensive Documentation of Benefits in Decision Document" (5 January 2021) the PDT relied on the expertise of the interagency team and other local experts to determine OSE. Per guidance, teams can, at a minimum, consider urban, rural and community impacts; life, health, and safety factors; displacement; and long-term productivity under OSE.

The study area does not contain any human communities, and adjacent communities are not at risk for environmental, socioeconomic, or demographic impacts. There are no expected negative effects for any of the action alternatives related to life safety, health, displacement, social connectivity, etc. However, positive effects related to recreation (wildlife viewing, hiking, etc.) and aesthetics may emerge as a result of the action alternatives. It was determined that effects captured under the OSE account would be minimal and this evaluation did not significantly contribute to the plan comparison process.

6.2 Comparison of Final Array of Alternatives.

6.2.1 Cost Effectiveness/Incremental Cost Analysis (CE/ICA)

IWR Planning Suite II software was used to complete a CE/ICA for the six alternatives (including the No Action Alternative), using the AAHUs and annualized costs described in this section. The CE/ICA is used when project benefits are not measured in dollars and is used to ensure the least cost alternative is identified for each possible level of environmental output, and the maximum level of output is identified for any level of investment. Cost Effectiveness evaluation is used to identify the least costly solution to achieve a range of project benefits; the Incremental Cost Analysis identifies the subset of cost-effective plans that are superior financial investments, called "Best Buys," through analysis of the preliminary incremental costs. Best Buys are the plans that are the most efficient at producing the output variable or provide the greatest increase in AAHUs for the least increase in preliminary cost. The first Best Buy is the most efficient plan, producing output at the lowest incremental cost per unit. If a higher level of output is desired than that provided by the first Best Buy, the second Best Buy is the most efficient plan for producing additional output, and so on.

The CE/ICA analysis evaluated six possible plans. **Figure 24** show the resulting alternatives differentiated by cost effectiveness. From this list of six alternatives, four cost effective plans that were not best buys, and two Best Buy Plans were identified (**Table 16** and **Figure 24**).

Table 16. Final Array of Alternatives Differentiated by Cost Effectiveness

Alternative Number	Alternative Name	Annualized Cost (\$)	Annualized Output (AAHU)	Average Cost/Output (\$/AAHU)	Cost Effective?
1	No Action	\$0	0	\$0	Yes (Best Buy)
2	Minimum 1	\$534,578	90.8	\$5,875	Yes
3	Intermediate 1	\$600,187	250.1	\$2,401	Yes
4	Intermediate 2	\$656,903	350.4	\$1,877	Yes
5	Intermediate 3	\$787,299	472.9	\$1,665	Yes
6	Maximum	\$895,777	695.2	\$1,289	Yes (Best Buy)

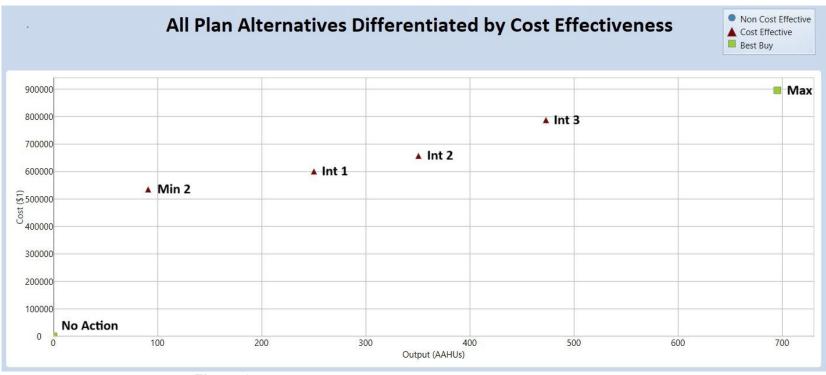


Figure 24. Final Array of Alternatives Differentiated by Cost Effectiveness

Table 17. Incremental Cost Analysis of Best Buy Alternatives

Alt	Alternative Name	Annualized Cost (\$)	Annualized Output (AAHU)	Incremental Cost (\$)	Incremental Output (AAHU)	Incremental Cost/Incremental Output (\$/AAHU)
1	No Action	\$0	0	0 \$0		\$0
6	Maximum	\$895,777	695.2	\$895,777	695.2	\$1,289

Table 18. Cost Effective Plans and Incremental Costs (AAHUs)

Name of Alternative	AAHUs	First Cost	Interest During Construction	Average Annual Cost	Average Annual Cost per AAHU	Additional Average Annual Cost	Additional Output(AAHUs)	Incremental Cost (per AAHU)
No Action	-	\$ -	\$ -	\$ -	\$ -	\$ -	-	\$ -
Min	90.8	\$13,117,000	\$394,986	\$534,578	\$5,887	\$534,578	90.81	\$5,887
Int 1	250.1	\$14,536,000	\$437,715	\$600,187	\$2,400	\$65,608	159.25	\$412
Int 2	350.4	\$15,552,000	\$468,310	\$656,903	\$1,875	\$56,717	100.36	\$565
Int 3	472.9	\$18,659,000	\$561,869	\$787,299	\$1,665	\$130,396	122.47	\$1,065
Max	695.2	\$21,136,000	\$636,458	\$895,777	\$1,289	\$108,478	222.27	\$488

Note: Costs are shown at the 2025 price level and were annualized using the current FY25 Federal discount rate of 3.0 percent over a 50-year period of analysis.

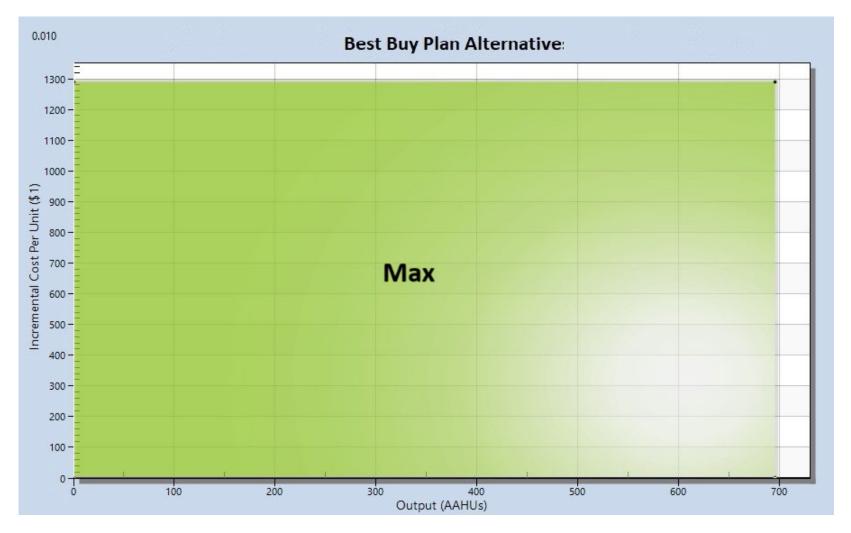


Figure 25. Incremental Cost Analysis of Best Buy Plans

While comparing the costs and outputs of the Best Buy Plans, it should be noted that the habitat models do not quantity all benefits, particularly with regards to habitat diversity and overlapping benefits. This is due to the fact that benefits on the landscape can only be accounted for once in the modeling. Even when increased diversity on the landscape benefits an increased number of species and contributes more to ecosystem health, the benefits quantified in the model are unchanged. Diversity is a measure of the variety of physical habitats and organisms that an ecosystem supports.

The two Best Buy alternatives (No Action and Maximum) were compared to determine which had the lowest incremental cost for each additional increment of output. **Table 17** and **Figure 25** present the alternatives' incremental cost and benefit information.

The first Best Buy, the No Action Plan, has the lowest average annual cost but produces no benefit. The No Action Alternative does not include any measures or provide any additional AAHUs. The No Action Alternative would have no financial cost to the federal government but does not meet any of the project objectives. The study area would continue to degrade as discussed in section 3.0.

The second Best Buy is the Maximum Alternative, which has an average annual cost of \$1,289 per AAHU. The Maximum Alternative would provide a net of 695 AAHU gain over the No Action alternative and would substantially meet all three objectives. This alternative is expected to improve habitat quality across the entire study area, including supporting the establishment of trees in open areas on newly created high ground on ridges, improving the quality of existing forest, and restore the quality of existing wetlands and creating new swamp habitat within newly created swales. This alternative would contribute meaningfully toward all the objectives, and though it has a relatively high incremental cost, it would be worth the investment. Since all of the alternatives were cost effective, the team decided to compare the incremental costs of all of the alternatives to determine whether another alternative would be competitive with the Best Buy plans to use in the full comparison of alternatives. **Table 18** shows the incremental costs of all the alternatives.

6.2.2 Table of Effects

Table 19 shows a comparison of the effects of each alternative across several evaluation categories compared to the baseline No Action alternative, including the 2013 Principles and Requirements for Federal Investments in Water Resources Criteria (completeness, effectiveness, efficiency, and acceptability); project-specific objectives; the Federal Objectives (from ER 1105-2-103); and the four P&G accounts (NED, EQ, RED, and OSE).

Principles and Guidelines

The final array of alternatives was evaluated against the 2013 Principles and Requirements for Federal Investments in Water Resources Criteria for completeness, effectiveness, efficiency, and acceptability (see Section 4.2 for discussion of each criterion):

Completeness: The PDT determined that, at this stage of the planning process, no additional investments were needed to obtain benefits, so all alternatives are considered "complete".

Effectiveness: All action alternatives are considered effective, but the Minimum 2 and Intermediate 1 alternatives only partially met the project objectives. The Intermediate 2, Intermediate 3, and Maximum alternatives met all three objectives, making them more

effective than Minimum 2 and Intermediate 1. However, the Maximum alternative is the most effective because it meets all three objectives while also maximizing the habitat benefits over the largest area of land. The Maximum alternative also restores a broader extent of contiguous habitat, providing greater benefit to native species. Large contiguous tracts of quality forest habitat are in decline in the Middle Mississippi Reach, where much of the floodplain is fragmented into smaller parcels. Fragmentation reduces habitat connectivity for wildlife, decreases overall biodiversity, increases "edge effect" impacts of environmental disturbance, and increases spread of invasive species. Smaller patches of forest decrease overall resiliency and health while reducing quality habitat for wildlife. Many species of concern in the floodplain, including migratory birds and bats, rely on contiguous forest habitat for nesting, foraging, and breeding.

Efficiency: All action alternatives are considered efficient. All are expected to provide net positive annual AAHUs, with the number of AAHUs increasing between the Minimum and the Maximum alternatives. Annualized costs per AAHU decrease between the Minimum and the Maximum alternatives. Thus, the Maximum alternative is the most efficient. See CE/ICA analysis in Section 6.2.1.

Acceptability: All action alternatives were considered acceptable regarding compliance with relevant laws and regulations. In terms of partner acceptability, all action alternatives were acceptable, but the Maximum alternative was preferred by the Sponsor.

Plan Identification

NER: The NER plan reasonably maximizes ecosystem restoration benefits compared to costs, while also meeting all planning objectives. The NER also considers information that cannot be quantified, such as environmental significance, scarcity, socioeconomic impacts, and historic properties. Based on the cost benefit analysis, the Maximum alternative was identified as the NER plan as it reasonably maximizes the average annual cost per habitat unit compared to the other alternatives, and it fully meets all three objectives.

Total Net Benefits: The Total Net Benefits plan is the Maximum alternative, which reasonably maximizes total net benefits across all benefit categories including monetized and non-monetized benefits. In terms of monetized benefits, the Maximum alternative has the lowest incremental cost among the Best Buy plans, and in terms of non-monetized benefits, it has the greatest number of AAHUs and the most habitat benefit.

LEDPA: The Least Environmentally Damaging Practicable Alternative (LEDPA) is identified by the Clean Water Act (CWA) under Section 404 (40 CFR Part 230). Nationwide Permit (NWP) 27 requires activities result in a net increase in aquatic resource functions and services. The analysis contained in the main report and Appendix documents compliance with that requirement and all associated NWP conditions. This analysis, combined with the NEPA analyses contained in the 2004 Integrated Feasibility Report, illustrate that the Maximum plan is not environmentally damaging, and thus the Maximum alternative meets the requirements to identify the Least Environmentally Damaging Practicable Alternative as specified in ER 1105-2-103.

Accounts

NED: Identification of an NED plan is not required because this is an ecosystem restoration project. However, alternatives' annualized cost and cost effectiveness are provided under the NED account as shown in **Table 19**.

RED: Table 15 in Section 6.1.6 shows a comparison of local impacts for all alternatives based on the full RECONS analysis performed. That analysis indicated that regional benefits would increase between the Minimum and Maximum alternatives, and that the Maximum alternative would have the highest local capture (\$13,955,000), highest output (\$19,873,000), most jobs created (171.5), highest labor income (\$10,472,000), and highest value added (\$10,501,000) when compared to the other alternatives.

EQ: All the action alternatives would increase environmental quality in the study area. in terms of habitat benefits calculated from habitat models, the Maximum alternative is expected to create 695 AAHUs at a cost of \$1,289 per AAHUs, making it both the highest producer of habitat benefits and the most efficient. All the action alternatives would also present a learning opportunity for the broader NESP program through the use of ridges and swales, which create topographic diversity within the floodplain being restored. All action alternatives also emphasize the use of resilient species; more of these species would be planted under the Maximum alternative. All action alternatives include tree planting in open areas, which would increase the area of contiguous forest in the study area, which would increase overall biodiversity, reduce "edge effects" impacts of environmental disturbance, and support migratory species that rely on contiguous forest habitat for nesting, foraging, and breeding. The Intermediate 2, Intermediate 3, and Maximum alternatives includes the most tree planting and would therefore have the greatest benefit to forest contiguity. The Maximum alternative provides the greatest restoration to overall forest habitat given that it maximizes the acreage of FSI for existing forest in addition to tree planting. Action alternatives would use a phased planting and adaptive management approach to learn what vegetation thrives in the conditions at the study area. The Maximum alternative provides the largest landscape for the phased plantings to be carried out and observed. Ultimately, the Maximum alternative has the highest increase in the net quantity of restored habitat.

OSE: There are no expected negative effects for any of the action alternatives related to life safety, health, displacement, social connectivity, etc. However, positive effects related to recreation (wildlife viewing, hiking, etc.) and aesthetics may emerge as more floodplain habitat is restored, increasing both the quantity of vegetation and the quality of habitat for native species. It was determined that effects captured under the OSE account would be minimal and this evaluation did not significantly contribute to the plan comparison process.

Table 19. Table of Effects – Alternatives Comparison for Comprehensive Benefits Evaluation

	Sustainable Developme	Economic nt	Floodnlains		Resilient	Healthy & Resilient Ecosystems	Equity & Other Benefits			
P&G ACCOUNTS	NED	RED	EQ	EQ	EQ	EQ	OSE			
PLANNING OBJECTIVES (specific to the study)			Floodplain Forest Communities; Restore Natural	Forest Communitie s; Restore	Restore Floodplain Forest Communities ; Restore Wetland	All objectives				
EVALUATION CRITERIA		Effectiveness	Acceptability	Efficiency	Effectiveness	Effectiveness	Effectiveness	Acceptability	Acceptability	Completeness
(QUAN and	Annualized Cost (\$) / Cost Effective	KRECONS.	Land Use/Land Cover	Annualized Cost (\$) / AAHU	AAHUS (Net	Objectives	Local Community Benefits	Under NESP \$25M limit Project First Cost	Partner Satisfaction / O&M	Complete
No Action	\$0 / Yes	\$0	Public land; forest & wetland	\$0	I()	No objectives met	No	Yes / \$0	No, Provides no solution	No
Minimum 2	\$534,578 / Yes	\$12,333,000	Public land; forest & wetland	\$5,874	91	Obj 1 & 2 met	No	Yes / \$13,117,000	Yes / Annual O&M \$2.8k	Yes
Intermediate 1	\$600,187 / Yes	\$13,668,000	Public land; forest & wetland	\$2,401	250	Obj 1 & 2 met	No	Yes / \$14,536,000	Yes / Annual O&M \$4.9k	Yes
Intermediate 2	\$656,903 / Yes	\$14,623,000	Public land; forest & wetland	\$1,877	15つ()	Obj 1, 2, & 3 met	No	Yes / \$15,552,000	Yes / Annual O&M \$9.4k	Yes
Intermediate 3	\$787,299 / Yes	\$17,544,000	Public land; forest & wetland	\$1,664		Obj 1, 2, & 3 met	No	Yes / \$18,659,000	Yes / Annual O&M \$10.8k	Yes
Maximum (T, R, L, D)	\$895,777 / Best Buy plan with highest cost.	\$19,873,000	Public land; forest & wetland	\$1,289	Inun	Obj 1, 2, & 3 met	No	Yes / \$21,136,000	Sponsor preferred / Annual O&M \$13k	Yes

⁽L) denotes the Least Environmentally Damaging Practicable (LEDPA) plan.

⁽R) denotes the National Ecosystem Restoration (NER) plan.

⁽T) denotes the Total Net Benefits plan.

6.3 Selection of the Tentatively Selected Plan/Recommended Plan.

The PDT considered the total benefits of project alternatives, including equal consideration of economic, environmental, and social categories.

Review of the four formulation criteria suggested by the P&G (completeness, effectiveness, efficiency, and acceptability), CE/ICA, and resource significance (institutional, public, and technical) were used to aid in the selection of a TSP.

The alternative plan that reasonably maximizes benefits in relation to cost and meets the overall project goals and objectives is the Maximum Alternative, which was selected as both the NER Plan and LEDPA. The maximum alternative is the TSP for Horse Island based on its effectiveness providing benefits to 2,000 acres of floodplain forest habitat. The Maximum Plan was approved as the TSP by the Mississippi Valley Division during a briefing held on 13 February 2025. When viewed relative to the preliminary costs of similar ecosystem restoration projects, the cost per AAHU of the Maximum Alternative is efficient in achieving the ecosystem restoration objectives. The Maximum Alternative yields an overall output of 695 net AAHUs and would provide habitat benefits based on topographic diversity, forest diversity, and wetland restoration. The TSP meets all the objectives while maximizing habitat benefit (is the most effective). The TSP (Plan) is consistent with regional plans for the area.

The PDT coordinated closely with the Sponsor to develop measures and alternatives. The selected TSP is preferred by the Sponsor because it maximizes ecosystem restoration benefits, supports a landscape-level approach to restoration, and addresses all project goals and objectives. It minimizes O&M by including considerations to support the long-term success of the measures. Additionally, it includes a significant portion of ridge and swale creation, which is a priority for the Sponsor. The project will be implemented in phases, which will allow monitoring for success of the Plan measures and support an adaptive approach.

This project would also provide a learning opportunity under the NESP program. The team worked to incorporate more adaptive forest management strategies (Section 7.4) including species that can withstand flooding and other climactic changes. Additionally, the creation of ridges and swales provides an opportunity for gradient-style planting where appropriate species are selected for different elevations.

The Fiscal Year 2025 project first cost of the TSP is \$21,136,000 and is anticipated to yield 695 net AAHUs annually. Using the Fiscal Year 2025 federal discount rate of 3.0%, this results in an average annual cost of \$1,289 per AAHU.

7 TENTATIVELY SELECTED PLAN/RECOMMENDED PLAN

7.1 Description of Plan.

The TSP was developed following an analysis of project alternatives, including a CE/ICA. The TSP is shown on **Figure 26**, and described as follows:

The TSP includes 237 acres of ridges and swale creation, 211 acres of tree planting (much of which is on the constructed ridges and swales), 1,317 acres of FSI, and 163 acres of wetland restoration. The tree planting would be implemented in a phased approach, separated over time and space. The species selected for planting would be chosen based on elevation, current site conditions, and desired future forest stand conditions. A variety of species will be considered to increase resiliency and habitat diversity across the study area. Specifics on the implementation of FSI actions will be determined by stand-level forest management prescriptions for Horse Island. These prescriptions, which will be incorporated into a larger forest management plan for the unit, will be developed using data collected during the USACE Forest Inventory Phase II protocol completed in early 2025 as well as stand walks conducted by USFWS and USACE foresters. More information on measures and design considerations is in Section 7.4.

Table 20. Description of TSP measures.

Measure	Actions	Acres
Tree planting in open areas	Planting containerized stock of native trees in already unforested areas Priority is increasing forest community diversity, including plant communities including early successional, wet bottomland, mixed, and bottomland hard mast (oak-hickory, floodplain ridge and riverfront terrace).	211 acres
Ridge and Swale	Maximum height of ridges is from 470-475 ft, based on USFWS elevation guidelines for hard mast suitability (Figure 18). Ridge height is also determined by existing topography, and availability of material on-site. No additional earth will be brought from off-site for construction. Ridges will use existing topsoil on site to ensure suitability for native trees Ridges follow existing topographic variation of old fields, with ridges on highest elevation and swales at lowest Elevation and site conditions will influence species selection. Ridges will be planted in a gradient, with focus on establishing bottomland hardwood (oak-hickory, floodplain terrace, and riverfront terrace) on ridges (see Figure 18)	237 acres
Forest Stand Improvement (FSI)	FSI will include several different actions such as: underplanting native trees and shrubs, thinning, gap creation, invasive species treatment, discing for native seed catch, and	1,317 acres

Measure	Actions	Acres
	tree planting in gaps. Prescriptions will be finalized during design phase for each stand.	
	Elevation and site conditions will influence species and stock selection (Figure 18).	
	Priority will be on increasing forest community, structural, and species diversity, increasing resilience, and supporting natural regeneration	
	Planting on wetland and backswamp species in existing depressions	
Wetland Restoration	Will include tree planting to create backswamp habitat (Figure 18)	163 acres
	Herbaceous planting will be included in areas with elevation less than 360 ft. Herbaceous and tree planting areas will be determined in the design phase during prescription development.	

The Plan is consistent with the NESP ecosystem restoration program authorization in WRDA 2007 Section 8004 and would, in concert with other NESP ecosystem projects, ensure the environmental sustainability of the existing Upper Mississippi River and Illinois Waterway and address the cumulative environmental impacts of operation of the system and improve the ecological integrity of the Upper Mississippi River and Illinois River. The proposed project fits within the general framework of the larger NESP Recommended Plan as described in **Table 21 below**.

 Table 21. Alignment with the Authorized NESP Recommended Plan for Ecosystem Projects

Type of Ecosystem Project	Number of Projects	Acres Benefitted
Floodplain Restoration	1	2,021

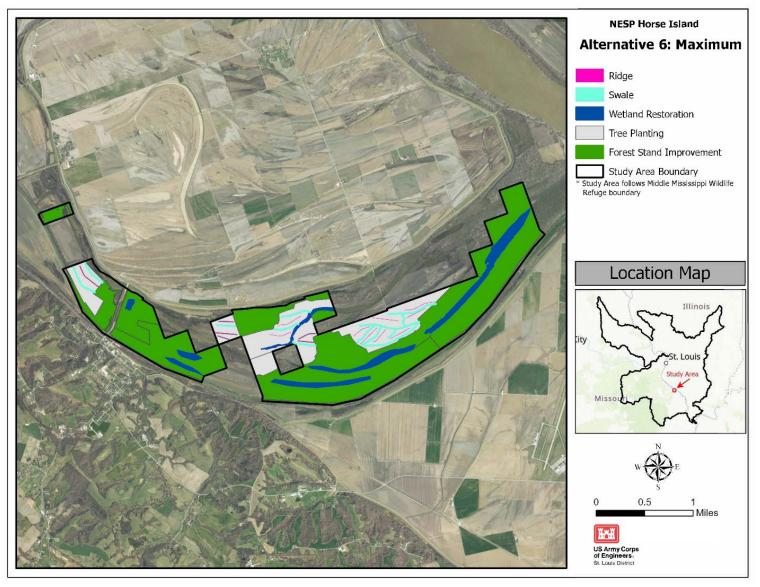


Figure 26. Tentatively Selected Plan: Maximum Alternative

Table 22 presents the Project Implementation Schedule.

 Table 22. Project Implementation Report Schedule

Event	Completed/Scheduled Date
Public Review of Draft Report	June 2025
Submit Draft PIR/EA to MVD for Policy and Legal Compliance	
Review	June 2025
Final PIR/EA to MVD for Approval	Late August 2025
Initiate Construction	Summer 2026
Complete All Construction Stages	2033
Complete Adaptive Management and Monitoring (10 years)	2043

Details of quantities and design for the TSP can be found in Appendix B – Civil Engineering. A summary of quantities is located in **Table 23**.

Table 23. Summary of the Quantities for the TSP Measures

Measure	Acres	Earthwork (CY)	Tree Planting (bareroot)	Tree Planting (3 <i>gallon</i>)	Tree Planting (15 gallon)	Tree Planting (cutting)
Ridges and Swales	49.6	Cut: 412,782 Fill: 410,440	0	29,568	0	0
Tree Planting in Open Areas	448.5	N/A	и и	и и	<i>u u</i>	0
Forest Stand Improvement	1289.6	N/A	55,000	20,636	0	17,187
Wetland Restoration	162.7	N/A	3000	1,793	1,490	0
Total	1950.1	N/A	58,000	51,997	1,490	17,187

Tree planting quantities were based on estimated planting acreage per measure and tree spacing per stock type. Four stock types were considered due to their different costs and tolerance to inundation, vegetative competition, and wildlife disturbance. Stock types are further discussed in the Design Considerations, Section 7.4.

7.2 Cost Estimates.

Table 24 presents the Project first cost including contingencies. Quantities and costs may vary during final design. A full description of the cost estimate, including all related elements, can be found in Appendix G – Cost.

 Table 24. Project Design and Construction Cost Estimates (in \$1,000s) (2025 Price Level)

Account	Measure	Project First Cost
01	Lands and Damages	\$0
06	Fish and Wildlife Facilities	\$17,672
30	Planning, Engineering and Design	\$2,757

Account	Measure	Project First Cost
31	Construction Management	\$1,451
·	TOTAL	\$21,881

The annualized costs and AAHUs were used to calculate a total annual cost per average annual habitat unit (**Table 25**). The total cost per habitat unit is \$1,332. The costs used for analysis purposes include total construction costs, IDC, and annualized O&M, adaptive management, and monitoring costs.

Table 25. Total Annual Cost per AAHU (FY25 Price Level, 3.0% discount rate).

Analysis Element	Present Cost	Annual Costs Total
Project First Cost (\$)	\$ 21,881,000	
Interest During Construction, IDC (\$)	\$659,000	
Subtotal	\$22,540,000	
Annualized First Cost (\$)		\$876,000
Annual Operations and Management Costs (\$)		\$13,000
Total Annual Costs (\$)		\$889,000
AAHUs		695
Total Annual Cost/AAHU (\$)		\$1,279

Costs for post-construction evaluation, as described in Section 7.7, are provided in Appendix D – Monitoring and Adaptive Management. Performance monitoring and adaptive management are funded by the NESP Program.

The USFWS is the non-federal cost sharing sponsor for all features of the project. The project first cost includes the value of lands, easements, rights-of-way, and relocations, and dredged material placement area improvements (LERRD). Total LERRD costs are estimated to be \$15,000 (all within the 30 Planning, Engineering, and Design cost account). The federal share of the project first cost for initial construction is estimated at \$21,811,000; there is no non-federal Sponsor and thus no non-federal share. The federal Sponsor will be responsible for 100 percent of the cost of project O&M. O&M activities and costs are described in Section 7.3.

7.3 O&M Considerations.

O&M of ecosystem restoration projects is similar to that undertaken by the partner agencies in day-to-day management of parks, boat ramps, wildlife management areas, and other public use areas. O&M is the responsibility of the Sponsor, USFWS. Upon completion of the construction as determined by the District Engineer, USFWS shall operate and maintain the Project as defined in this PIR/EA and in the Project's O&M manual. O&M measures were not identified for the ridge & swale features. It is anticipated that these features will be functional for the duration of the project based on targeted elevation of the features and the tree planting and the native cover crop preventing erosion. Furthermore, O&M measures for the ridge & swale would require the removal of native cover crop and planted trees in order to add or remove material as needed which would result in decreased overall performance of the measure.

This Project was designed to reduce overall operation costs and ensure low annual maintenance requirements. Project considerations to reduce O&M will include:

- Selecting a variety of species based on elevation, inundation periods, and site conditions to maximize survivorship
- Incorporating site preparation to reduce vegetative competition, such as invasive species treatment, mowing, and native cover crop.
- Including tree establishment actions with planting measures for three to five years, such as follow-up invasive species treatment, to improve long-term survivorship of planted trees.
- Considering a variety of species and planting stock based on site conditions, inundation tolerance, elevation, and desired stand conditions and objectives.
- Incorporating phased planting to allow for adaptive planting strategies and monitoring of measure success and response to modification and hydrologic variability
- Utilizing data driven management planning

Maintenance requirements would be further detailed in the Project's O&M manual published after construction completion and preparation of as-built drawings, and prior to transferring the Project to the Sponsor.

The annual cost of OMRR&R for the TSP is estimated to be \$13,000. OMRR&R activities include tree planting maintenance of annual herbicide spraying (two times per growing season) and mowing (two times per growing season) to reduce vegetative competition. In general, operation is limited to site visits and inspections to ensure that the measures are performing as designed. The Sponsor will be responsible for 100 percent of the cost of project OMRR&R. **Table 26** lists the major O&M components, their associated frequencies, and costs.

O&M Component	Frequency	Cost
Mowing open areas	Year 1 and 2	\$60,503
Spraying open areas	Year 1 and 2	\$107,560
Spraying FSI areas	Year 1 and 2	\$158,040
Spraying wetland areas	Year 1 and 2	\$16,300

Table 26. O&M Considerations.

7.4 Design Considerations.

The Preconstruction Engineering Design (PED) phase of the project will continue to refine the layout, with the engineering effort centered primarily on design of the ridges and swales. This refinement will take form in three different ways: utilization of newly acquired LiDAR data, 3D modeling of ridges and swales, and further Sponsor coordination and input.

The LiDAR utilized by the study for the entire project site was flown in early 2025 and will be used as existing ground surface for PED. Additionally, the data will be incorporated into ongoing H&H modeling efforts. Low lying areas within the project site likely had some shallow water present during LiDAR collection, and the bathymetric data will not be shown in the LiDAR. No additional surveying needs are anticipated for the project.

For a synopsis of assumptions and design effort during the PIR development, see Appendix B – Civil Design. 3D modeling of ridges and swales will take place during PED to further estimate quantities as well as accurately model plan and elevation of the ridges and swales. Transitions between features will be modeled in detail. Cut and fill balance within ridge and swale complexes will be verified and design modifications made, as necessary, to maintain balance.

Sponsor input and coordination will also play a key role in PED as the layout is fine-tuned around existing features. Drainage throughout the site will be further analyzed and verified to meet Sponsor needs.

The Maximum alternative gives the option to implement the measures over time and space. Construction contracts can be executed over many years and the USFWS can decide to pause at any point. Phased planting of the open fields, ridge & swales, and the forested areas will decrease construction disturbance and maximize survivability and resiliency of the plantings. Phased planting will allow for adaptive planting and FSI strategies, especially in consideration of the variety of new species that will be included in the planting.

Ridge and Swale

The top elevation for ridges and swales is 370 ft to 375 ft (see Appendix B Civil Design) – these elevations were selected from several contributing factors.

- Information from the sponsors supports that at these elevations, hard mast trees like bur oak, pin oak, and shellbark hickory can be supported (see **Figure 17**).
- Existing tree stands also show that pecans, the only hard mast species in the study area, is supported at 370 ft to 375 ft with natural regeneration occurring.
- Looking at the gage data from Chester, 370 ft and 375 ft has only been exceeded 2.9% and 1.0% of the time, respectively, in the past 50 years (1974 2023). When exceeded, the median duration of days exceed has been 9 and 6 days for 370 ft and 375 ft. This flooding pattern would not pose a substantial risk to the survivability of hard mast trees planted on the ridges.

Tree Planting Considerations

Tree planting took into consideration several stock types, including bare roots, containerized stock, and cuttings. Bare root trees are seedlings purchased without soil around their roots and can be planted directly into the ground. They are less costly to purchase, transport, and plant due to their size. However, they have lower tolerance to inundation and have higher mortality in areas with vegetative competition. More site preparation will need to be considered when planting. Containerized stock is purchased potted in various sizes, including 3-gallon and 15gallon. Because they are more mature, especially in regard to above ground growth, containerized trees have higher survivorship in floodplain restoration efforts and have a greater tolerance to inundation and vegetative competition. Larger containerized stock was also considered for wetland/backswamp restoration because this measure will include planting species that are commonly targeted by wildlife herbivory, such as cypress. Planting mature stock may prevent mortality from wildlife disturbance. Additionally, only containerized stock will be used for tree planting in open areas and ridge and swale plantings because these measures will include slower growing oak and hickory species. Lastly, tree cuttings can be a cost-effective method to establish early successional species such as cottonwood and willow. They can be cut directly from trees on-site, reducing transportation and planting costs. They can also be planted at a high density, which makes them suitable for quickly establishing forest cover in canopy gaps. These quantities may change during design but allow for flexibility during planting to ensure suitability to site conditions.

Elevation and site suitability will play an important role in determining species for planting. A guide was made by USFWS (**Figure 17**) that lists tree and shrub species in categorical forest communities for use in ecosystem restoration projects on the Middle Mississippi River National Wildlife Refuge. These forest communities have been conceptually categorized based on

seedling flood tolerance and relative site elevations.

Flood Adaptive Planning

Variability in hydrology have and will continue to impact the resilience of forest communities in the project area. This site is not protected by levees and is subject to the flooding and inundation of the Open River. It is expected that flooding will continue to change in severity and frequency, increasing inundation of the forest communities and subsequently increasing tree stress and morality. Extreme rain and drought events could further impacting flooding and inundation. The project design will include incorporating trees with ranges in the southern United States that are already more adapted to longer inundation as well as weather variability. This includes species such as Bald Cypress (*Taxodium distichum*), Swamp Cottonwood (*Populus heterophylla*), and Nuttall Oak (*Quercus texana*). The construction of higher ridges with a gradient of elevations for planting will also increase opportunities to plant oak and hickory on the project site, since these ridges will have less average inundation.

Additionally, we will be planting in stages to account for variability in weather and river conditions. This will reduce risk of large-scale mortality of planted stock due to a weather or hydrological event.

7.5 Construction Considerations.

General construction considerations for this project include the following:

- Flooding has the potential to limit site access and delay construction.
- Construction staging and access will be further determined during PED, but the site is generally accessible by public roads.
- For tree plantings planned for areas of ridge and swale construction, ridge and swales must be complete prior to planting.
- No tree clearing is anticipated for the project.
- Ridge and swale complexes will be cut/fill balanced, therefore no major hauling is anticipated. Soil materials present on the site appear/are assumed to be suitable for ridge construction, so no spoil is anticipated.

7.6 Real Estate Considerations.

For this Project, the USFWS is acting as the Sponsor. A map showing the Project area is included in Appendix F – Real Estate. All proposed project features are on lands owned by the United States of America in Fee Simple and currently managed by the USFWS. No land acquisition is required to support project features. No non-standard estates are required for implementation of this Project.

There are no proposed Public Law 91-646 relocations, as there are no acquisitions required.

All access to the Project will be by county road.

Sponsor agreement description and a Real Estate Plan is included as Appendix G – Real Estate Plan.

7.7 Monitoring and Adaptive Management.

The NESP ecosystem restoration element is structured around a comprehensive adaptive management strategy encompassing numerous spatial scales (e.g., system-scale to project-scale). The program's adaptive management framework is more expansive than the traditional

adaptive management approach specified in Corps civil works regulations and policies. As a result, Section 8 of the NESP implementation guidance clarified that many existing policy constraints related to adaptive management costs and durations were not applicable to NESP, as authorized. The implementation guidance further specified that monitoring and adaptive management under NESP would be accomplished according to the framework and costs authorized, as reflected in the feasibility report.

As described in Section 6.2.4 of the NESP IFR, adaptive management costs were not included in the cost estimates for individual projects. Rather, project-specific adaptive management costs were captured under separate program-level funding described in Table 14-7 of the NESP IFR as Restoration Response Monitoring and Evaluation. Per the NESP IFR, the per-project costs accountable for under the \$25,000,000 per project limit include planning, design, construction and contingency, with adaptive management costs excluded. While PIRs are required to describe project-specific adaptive management elements, including performance indicators, monitoring plans, and timelines for achieving success, the costs attributable to these adaptive management costs are program costs that should not be accounted for when considering the \$25,000,000 per project limit.

This section summarizes the post-construction evaluation plan, which includes performance monitoring, adaptive management, and long-term performance reporting, described in Table 27. See Appendix D – Monitoring and Adaptive Management, for a full description of post-construction evaluation, including performance monitoring, adaptive management activities, and long-term performance reporting. **Table 27** presents the post-construction evaluation plan, which displays several specific parameters and the levels of restoration that the Project hopes to achieve. The cost of adaptive management and monitoring is estimated at \$940,000 (FY25 dollars), or \$37,000 annually. Those costs are program costs that will be borne and tracked by NESP programmatically.

Monitoring Stage	Length of Time	Description	Funding Source
Performance Monitoring	10 years	For entire Project, determine the degree to which the Project is meeting the success criteria and for informing potential adaptive management decisions	Program Cost
Adaptive Management	10 years	Monitoring will take place at years 2, 5, and 9 post-planting to determine success of planted trees. Wetland/Backswamp monitoring will take place at years 2, 5, and 9 post-planting to determine success of planted wet prairie species to determine ground cover (percent ground cover of planted species).	Program Cost

Table 27. Post-Construction Evaluation Description.

The 2008 Implementation Guidance for Upper Mississippi River and Illinois Waterway System also indicates that NESP PIRs must consider the "degree to which the project contributes to learning in an adaptive management context..." Horse Island contributes to learning in an adaptive management context by demonstrating the effectiveness of ridge & swale topography

and through improving floodplain restoration design by refining tree species suitability for planting at various floodplain elevations. Other factors may be considered to evaluate Project performance and success.

From 2008 IG: The adaptive management approach will focus on delivering meaningful navigation and restoration benefits as early as possible, scheduling projects to provide early benefits and learning that can be applied to future projects, scheduling projects recognizing their mutual dependency in realizing navigation and ecosystem restoration system benefits and phasing large projects to provide early benefits.

7.8 Environmental Operating Principles (EOPs).

The Environmental Operating Principles (EOPs) outline the USACE's role and responsibility to sustainably use and restore our natural resources in a world that is complex and changing. The TSP meets the intent of the EOPs. The PDT proactively considered the environmental consequences of the proposed Project, as well as the benefits of the TSP. The Project would be constructed in compliance with all applicable environmental laws and regulations. In accordance with the EOPs, the District has proposed a Project that supports economic and environmentally sustainable solutions.

7.9 Risk and Uncertainty.

Areas of risk and uncertainty have been analyzed and were defined so that decisions could be made regarding the reliability of estimated benefits and the costs of alternative plans. Risk is defined as the probability or likelihood for an outcome. Uncertainty refers to the likelihood that an outcome results from a lack of knowledge about critical elements or processes that then contributes to risk or natural variability in the same elements or processes.

The PDT worked to manage risk in developing measures by expanding on and referencing successful similar work completed by previous UMRS restoration projects and the Upper Mississippi River Restoration Environmental Management Program Environmental Design Handbook (USACE, Rock Island District, Rock Island IL), 2012. The PDT used that experience and information to identify possible risks and decrease uncertainty in plan formulation. No measures in the TSP are believed to be burdened by significant risk or uncertainty regarding the eventual success of the proposed measures. Significant risk would be avoided by proper design, appropriate selection, and correct seasonal timing of applications.

Study Risks:

No-Rise Analysis: A "no-rise" certification (Illinois Rivers, Lake, and Streams Act ("RLSA") permit) may be needed for this project. This project (as with other NESP projects) will have very limited design during the PIR phase. The study team will conduct preliminary hydraulic modeling to evaluate no-rise, but the study but will not apply for the permit until greater design maturity in PED. Depending on the future receptiveness of Illinois Department of Natural Resources (IDNR) to the design, a change may be needed.

Management: IDNR was consulted in January of 2025 regarding this potential project. From that meeting, the PDT learned that a hydraulic model may not be necessary for obtaining a no-rise permit; however, if it is required, only topographic changes (ridges and swales) should be accounted for in the model. Changes to land cover (from planted vegetation) is not regulated by IDNR, and therefore, it should not be accounted for in the model. Additionally, it was verified that Illinois state guidelines dictate that in rural areas

such as the project site, proposed features may not cause more than 0.5 feet of rise in water surface elevation under a 0.01% AEP) (Illinois Department of Natural Resources, 2014).

Potential Takings Analysis: USACE guidance is evolving on takings analysis.

Management: Coordination between the St. Louis District Hydrologic and Hydraulics Branch and St. Louis District Office of Counsel is ongoing.

Forest inventory data: Forest inventory data was not available prior to TSP selection. Without detailed forest stand data, alternatives are more generalized. Once the data is received, the scale of the FSI may change; FSI is included in all the action alternatives.

Management: Assumptions have been coordinated with the Sponsor; stand walks and inventory will occur in spring 2025 to gather data as soon as reasonably possible.

NESP Program cost limit: The risk is that the Maximum alternative cost will exceed the \$25M NESP ecosystem total project cost limit described in the NESP authorization. The metric to use is the Total Project Cost (Project First Cost escalated to the mid-point of construction) in addition to the study/planning cost, from the certified cost that will be in the Cost appendix for the Final PIR report.

Management: The study team addressed cost risk including percentage for contingency and used conservative percentages and escalated the Project First Cost early. Cost is not expected to exceed the \$25M cost limit.

Implementation Risks:

O&M: The risk is that O&M is not sufficient to ensure tree survivorship and habitat benefits as anticipated in this project.

Management: The study team coordinated with the Sponsor which has concurred with O&M expectations.

Availability of trees to be planted: The TSP requires a large number of trees to be planted. Availability of trees in a given year may be limited in terms of quantity, stock, and species availability constraints.

Management: Phased planting would be implemented with close coordination with nurseries to determine supply/availability.

Availability of suitable on-site soils: As discussed in [7.5 Construction Considerations], onsite material is assumed to be suitable for ridge construction.

Management: Additional investigations will be evaluated as the project progresses into PED. If necessary, ridge and swale design will be adjusted to account for unsuitable material while maintaining cut/fill balance.

Performance Risks:

Illinois EPA 303(d) - The Mississippi River within the vicinity of the study area (Assessment ID IL-D-01) is listed in the Illinois 2022 303(d) list for impairment for Aldrin, Dieldrin, Endrin, fecal coliform, Heptachlor, mercury, Mirex, polychlorinated biphenyls, and Toxaphene based on fish consumption (Illinois Environmental Protection Agency, 2023). The status of IL-D-01 is likely to remain similar to existing conditions should the TSP be constructed.

Section 401 Compliance – The measures in the TSP would fit a Nationwide Permit 27 for Aquatic Habitat Restoration, Enhancement, and Establishment Activities and would include programmatic 401 certification. Therefore, an Individual Illinois EPA 401 Certification will not be pursued (Appendix L).

Section 402 Compliance – If the TSP results in at least one acre of soil disturbance then a Clean Water Act Section 402 Permit would be pursued. If a 402 permit is required, the contractor will be required to obtain an Illinois EPA National Pollutant Discharge Elimination System (NPDES) General Construction Permit.

Section 404 Compliance - Section 404 of the Clean Water Act regulates the placement of fill, such as rock, in waters of the United States. Specific impacts to water quality include displacement of water bodies by fill materials, stockpiling, and hydro-modifications. The wetland planting measure in the TSP would fit a Nationwide Permit 27 for Aquatic Habitat Restoration, Enhancement, and Establishment Activities and would include programmatic 401 certification (Appendix L).

7.10 Compliance with Environmental Statutes.

Status of compliance activities with environmental protection statutes, regulations, and guidelines is listed in **Table 28** below. Remaining compliance activities will be completed as construction limits and timelines develop with enough detail to properly coordinate any potential effects related to the TSP within and/or adjacent to the study area.

Table 28. Environmental Protection Statutes and Other Environmental Requirements

Federal Environmental Protection Statutes and Requirements	Applicability/ Compliance ^{1/2/3}
Federal Statutes	
Bald and Golden Eagle Protection Act of 1940, as amended	FULL
Clean Air Act, as amended	FULL
Clean Water Act, as amended	FULL
Coastal Zone Management Act, as amended	NA
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	FULL
National Historic Preservation Act of 1966, as amended	FULL
National Wildlife Refuge Administration Act of 1966	FULL
Noise Pollution and Abatement Act of 1972	FULL
Watershed Protection and Flood Prevention Act	FULL
Wild and Scenic Rivers Act of 1968, as amended	NA
Farmland Protection Policy Act of 1981	NA
Executive Orders, Memoranda	
Floodplain Management (E.O. 11988)	FULL
Protection of Wetlands (E.O. 11990)	FULL
Safeguarding the Nation from the Impacts of Invasive Species (E.O. 13112)	FULL
Protection and Enhancement of Environmental Quality (E.O. 11514)	FULL
Protection and Enhancement of the Cultural Environment (E.O. 11593)	FULL
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum,	
Aug 1976)	NA
Consultation and Coordination with Indian Tribal Governments (E.O. 13175)	FULL

¹ Full Compliance = having met all requirements of the statute for the current stage of project

² Partial Compliance = having met some requirements of the statute for the current stage of project or anticipate full compliance at completion of current state of project (additional information in Chapter 7.10)

³Not Applicable = no requirements for the statute or Project does not contain resources applicable to the law

8 PUBLIC INVOLVEMENT, COORDINATION, AND CONSULTATION

Scoping is an early and open process for determining the range of issues to be addressed and for identifying the significant issues related to a proposed action. Scoping was conducted during the planning process using a variety of communication methods with the affected public, agencies, and organizations. Scoping and coordination have been conducted with the following state and federal agencies, and other interested parties: USFWS, IDNR, and MDC.

8.1 Coordination Meetings.

This draft PIR/EA is a reflection of a collaboration of key partners and stakeholders. Numerous coordination and stakeholder meetings, as well as site visits, were conducted to discuss problems, opportunities, project goals and objectives, potential restoration measures, and expected outcomes with and without the proposed project. A scoping charrette was held 17 October 2023, prior to the development of the study. Representatives from USACE, USFWS, IDNR, and MDC attended and provided input on project objectives, potential measures, future conditions of the site, and identified resource issues. A full copy of the Planning Charrette report is available upon request. In addition, development of this report was actively coordinated throughout the planning process with the USFWS, IDNR, and MDC.

8.2 Coordination by Correspondence.

8.2.1 Public Views and Comments.

In accordance with NEPA, the draft report with integrated EA will be available to interested members of the public during a 30-day public review period. The report will be on the St. Louis District website and a letter will be mailed to interested members of the public identifying where to find the report, how to provide comments, and the date of the public meeting/open house to be held. Comments received during public review will be incorporated into the report where appropriate prior to finalizing the design.

8.2.2 Historical Preservation and Tribal Coordination

The National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to consider the effects of "undertakings", or projects, on significant historical or archaeological sites ("historic properties"). To ensure that agencies consider the effects they are required to provide the SHPO an opportunity to review and comment on the plans and the agency's assessment of the potential risk to historic properties through the process of consultation.

The Illinois State Historical Preservation Office was contacted on June 21, 2024. The St. Louis District made the determination of "no adverse effect" to historic properties due to the study area being a channel of the Mississippi River until the 20th century. The Illinois SHPO concurred with the St. Louis District's determination of "no adverse effect" on July 19, 2024. The St. Louis District consults with 24 Tribal Nations that have an interest in this area. Consultation with Tribal Nations was initiated on June 21, 2024. Two Tribes, the Caddo Nation (August 13, 2024) lowa Tribe of Kansas and Nebraska (June 21, 2024) and Peoria Tribe (July 10, 2024) concurred with the St. Louis District's determination of "no adverse effect" to historic properties in the study area. Correspondence to and from tribes is included in Appendix K.

8.2.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act directs the Service to investigate and report on proposed Federal actions that affect any stream or other body of water and to provide recommendations to minimize impacts on fish and wildlife resources (16 U.S.C. 661-666(e)). The PDT has been in communication with the USFWS regarding the Fish and Wildlife Coordination Act. The USFWS has been fully involved with the project and has provided guidance during the development of

the TSP. A Fish & Wildlife Coordination Act Report was requested on 14 March 2025. The report was received on 03 April 2025. The USFWS will also be consulted on the effects determinations made in the Biological Assessment in Section 5.12.

8.3 Views of the Sponsor.

The sponsor desires a comprehensive application of measures to improve the existing floodplain forest habitat in the study area. The sponsor desires relatively low operations and maintenance cost, including maintenance items that could be accomplished with existing personnel and resources available to the sponsor. There was no desire for features that would require electrical or other power to be installed on the site.

9 RECOMMENDATION

The Recommended Plan is the Maximum Alternative, including 237 acres of ridges and swale creation, 211 acres of tree planting, 1,317 acres of Forest Stand Improvement (FSI), and 163 acres of wetland restoration. The estimated Project first cost of the Recommended Plan is \$21,881,000 (October 2025 price level). The Federal share of the estimated first cost is \$21,881,000. Upon completion, the Sponsor is responsible for O&M at an estimated annual cost of \$13,000.

The expected outputs of the Recommended Plan include restoration of 1,950 acres of floodplain forest and wetland habitat. The Recommended Plan will contribute 695 average annual habitat units for forest and wetland habitat types over the 50-year period of analysis.

The Recommended Plan is consistent with the NESP ecosystem restoration program authorization in WRDA 2007 Section 8004 and will, in concert with other NESP ecosystem projects, ensure the environmental sustainability of the existing Upper Mississippi River and Illinois Waterway and address the cumulative environmental impacts of operation of the system and improve the ecological integrity of the Upper Mississippi River and Illinois River.

I have weighed the outputs to be obtained from the full implementation of the NESP Horse Island Ecosystem Restoration Project against its estimated cost and have considered the various alternatives proposed, impacts identified, and overall scope. I recommend that the NESP Horse Island Ecosystem Restoration Project be implemented as generally described in this report.

The recommendations herein reflect the information available at the time and current Department of the Army policies governing the formulation of individual projects. They do not reflect programming and budgeting priorities inherent in the formulation of national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are approved for implementing funding. However, prior to approval, the state, Federal agencies and other parties will be advised of any modifications and afforded the opportunity to comment.

ANDY J. PANNIER
COL, EN
Commanding (St. Louis District)

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Appendix A – Hydrology and Hydraulics

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1. Introduction

1.1 Study Reach

The Middle Mississippi River National Wildlife Refuge (Refuge) is located on the Mississippi River downstream from St. Louis, Missouri. The Horse Island Division is near Kaskaskia, Illinois [River Mile (RM) 113-111] and is shown in **Figure 1**. Over the past few centuries, the island emerged as the Mississippi River cut into the Kaskaskia River, altering its course. Lands in the study area are within the Refuge boundary and are owned by US Fish and Wildlife Service (USFWS). There are also privately owned inholdings. The study area comprises a total of 2,000 acres and consists of point bar (floodplain forest, riverfront forest, shrub swamp, and old field habitats) and backswamp (willow, shrub swamp and open water habitats) geomorphic surfaces on the riverside of the levees. Current land use is approximately 20% non-forested abandoned agricultural fields and 80% riverfront forest communities. The goal of this potential project is to restore the floodplain environment to withstand future impacts from hydrological, geomorphic, and biological influences.

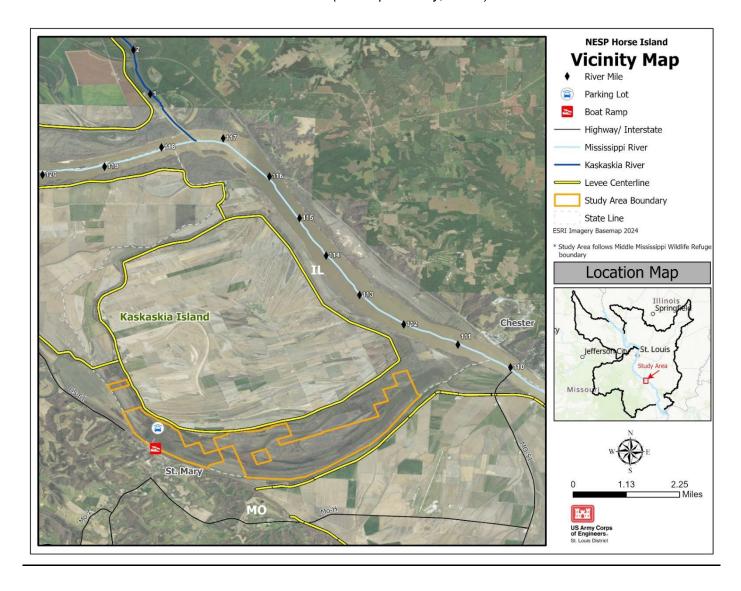


Figure 1. Study area and location map

1.2 Historical and Projected Future Information

Kaskaskia, Illinois has a dynamic history. In the early 1700s, it was home to members of the Kaskaskia tribe, Jesuit priests and French-Canadian fur traders. It was once considered to be the most important French town in the middle Mississippi Valley because of fur trade and related business. In 1818, Kaskaskia was named the first state capital of Illinois; however, this quickly titled was quickly transferred to another city. As early as the mid-1700s, it was observed that the 'river was dangerous' in this area. There were several floods that continued to shape the history of this area, a couple of which are discussed as follows. In 1844 there was a large flood on the Mississippi River and much of the town of Kaskaskia was inundated causing destruction and the flee of residents. In the flood of 1881, the Mississippi River shifted its course forming Kaskaskia Island (Horse Island is along the southern border of Kaskaskia Island). (Illinois, n.d.) This shift through time can be seen in **Figure 2** through **Figure 6** as follows.



Figure 2. Kaskaskia Island area in 1719, Before the Mississippi River Breach that created Kaskaskia Island (University of Illinois, (Illinois, n.d.))



Figure 3. Kaskaskia Island area in 1817, Before the Mississippi River Breach that created

Kaskaskia Island (USACE)

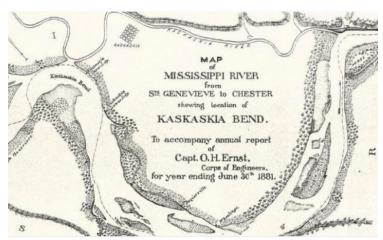


Figure 4. Kaskaskia Island area in 1881, During the Mississippi River Breach that created Kaskaskia Island (University of Illinois, (Illinois, n.d.))

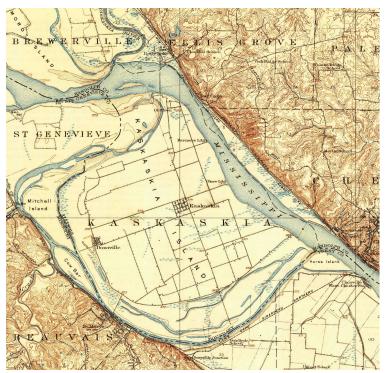


Figure 5. Kaskaskia Island area in 1915, After the Mississippi River Breach that created Kaskaskia Island (USGS)

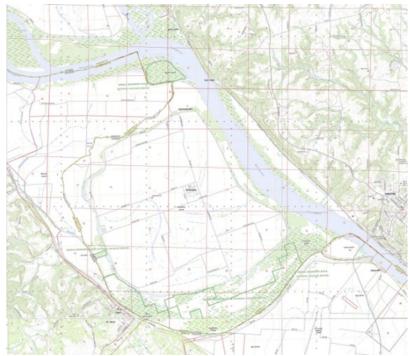


Figure 6. Kaskaskia Island 2021,2024 – After the Mississippi River Breach that created Kaskaskia Island (USGS)

Over time, the old main channel of the Mississippi River (the southern border of Horse Island) has slowly sedimented in from its pre-breach condition to the current condition. Local flows from the watersheds to west also help to keep the old main channel of the Mississippi River open to flow. Hydrologic trends show that the project area will continue to see large fluctuations in the water depth. As this area is exposed to floods, more aggradation is likely to occur – when flood waters backwater into this area, they are likely to deposit sediment due to their low velocities. Changes in sedimentation have the potential to reshape some of the hydraulic connectivity (or drainage patterns) in the area, but the study area is likely to have similar hydraulic connectivity to the existing conditions. The current topographic conditions can be seen in **Figure 7**.

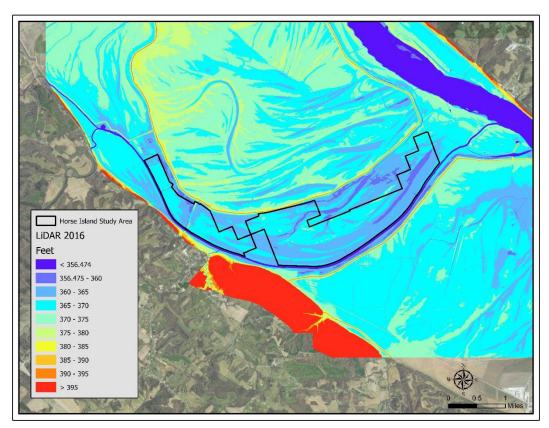


Figure 7. LiDAR (collected in 2016) throughout and around the study area

Between RM 113-111 on the open river, floodplain forest communities have severely declined in extent, diversity (age, structure, and species diversity), and resiliency due to changes in hydrology and hydraulics from implementation and operation of the 9-foot navigation channel, land use changes, and climate change. The conversion of native floodplain forest communities and spread of invasive species has resulted in the absence or limited quantity of tree species which provide food resources for migratory and resident wildlife. The degraded forest community provides reduced habitat suitability for wildlife such as neotropical migrants.

There are several river training structures within the main channel of the Mississippi River, but there are no structures within the Horse Island project area. Since the structures are located within the main channel, they should not be impacted by our project. **Figure 8** below shows the location of structures in the main channel. These are of varying age, construction material, and states of degradation.

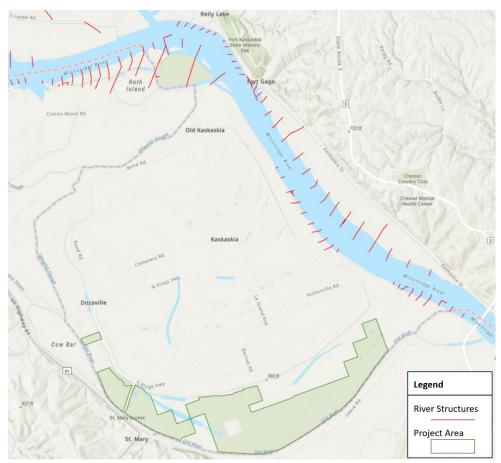


Figure 8. River Structures near Horse Island

1.3 Project Purpose and Need

Within the overarching NESP purpose, the purpose of this proposed project is floodplain restoration, including attaining and maintaining the sustainability of floodplain forest and wetland habitat in the Horse Island study area within the Refuge. The need for restoration actions within the study area is based on the following factors:

- The presence of invasive species;
- · Reduced native species richness and diversity;
- Low native tree regeneration;
- Reduced forest structural diversity;
- Reduced health and diversity of wetland habitats; and
- Lack of topographical diversity that was once characteristic to the floodplain before changes in land use.

2. River gage data analysis

This section introduces the gage data used in this project, then further describes how the gage data was analyzed to inform modeling and design decisions.

2.1 Gage Data

River gage data, including discharge (or flow) and water surface elevation (WSE), was used as

boundary conditions in the hydraulic model, as well as for model calibration and validation. Table 1 lists the name of each gage, the location, and the application in the project.

Table 1. Gage Data

Gage Name	Location	Application in Project
USGS 07020500 (also managed by USACE) Mississippi River at Chester, IL	109.9 miles above the mouth of the Ohio River	Upstream Flow Boundary and WSE Calibration
USACE Mississippi River at Red Rock, MO	94.1 miles above the mouth of the Ohio River	Downstream WSE Boundary

Note: The river gage at Chester, IL is owned and operated by the St. Louis District Corps of Engineers (USACE) maintained in cooperation with the US Geological Survey (USGS). Each of these agencies manages their own data (discharge and stage), resulting in two similar datasets. The data values are similar enough that using one dataset over the other would not have any significant impact on the project; however, the length of their records does vary significantly. For the purposes of this project, the longer datasets were used – that is discharge data from the USGS and stage data from the USACE. Additionally, USACE and USGS use a gage zero of 340.73 ft NAVD88.

2.2 Gage Data Analysis

This section walks through the process of how the gage analysis started simple and built upon as the project goals were developed.

Figure 9 plots the percent exceedance for WSEs at the Chester gage for the past 50 years (1974 – 2023). This dataset includes the effects of all major infrastructure and reservoirs on the river. Additionally, **Figure 10** shows how the maximum, minimum, and average WSE (from 1974 - 2023) change throughout the year.

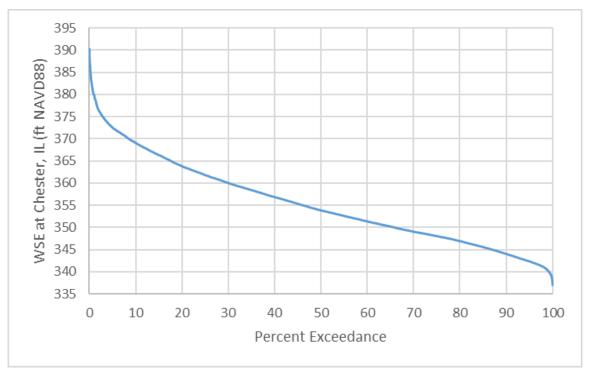


Figure 9. Percent Exceedance WSEs at Chester, IL

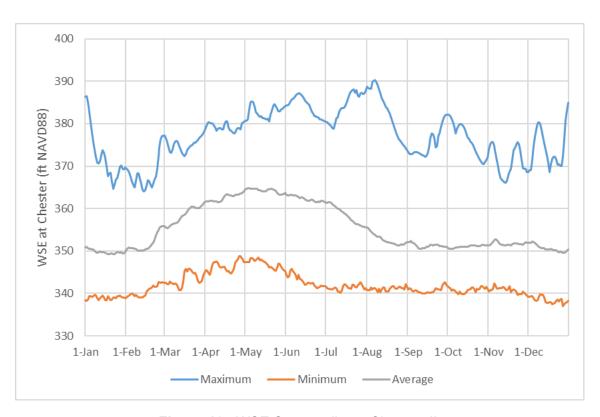


Figure 10. WSE Seasonality at Chester, IL

Percent exceedance, shown in **Figure 9**, is useful to start how often a certain elevation has been exceeded (or how often our project area has been experienced flooding). As seen in **Figure 10**, the highest WSEs generally occur during April and May and the lowest tend to be in December and January. It was identified that, for this project, the maximum and average WSEs at Chester are more relevant than minimum WSEs (the project area is not inundated when Chester stage is below about 360 ft NAVD88).

In discussions with the National Fish and Wildlife Service (NFWS), it was noted that this area seems to have flooded more frequently in the past decade than previous decades. This prompted a more detailed look at hydrologic trends over time. The average and maximum WSE by decade for the past 50 years is shown in **Figure 11** and **Figure 12**, respectfully.

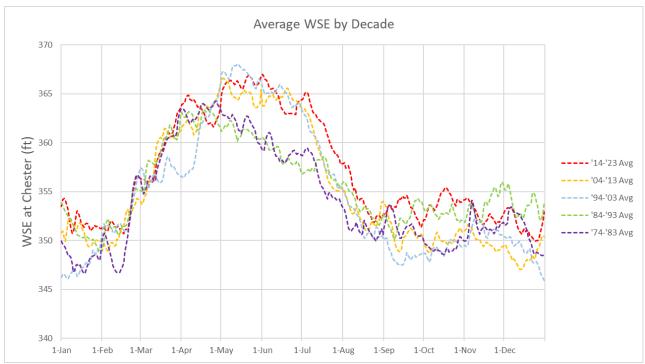


Figure 11. Average WSE at Chester by Decade

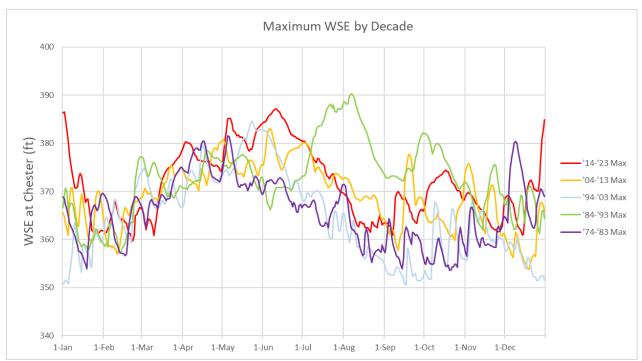


Figure 12. Maximum WSE at Chester by Decade

Figure 11 shows a higher average WSE from late spring through summer for the past three decades. The trends in fall and winter are less clear; however, the lower water surface elevations seen during the late fall and winter will not be used for design in this project. **Figure 12** shows higher maximums from May to June in the past three decades ('94-'23) than the previous two ('74-'93). Of the four highest maximum WSEs in the past 50 years, three were in the most recent decade ('14 – '23) and the other was from the flood of 1993. The maximums shown for the decade of '84-'93, the maximums from July to October are all from the 1993 flood.

Average and maximum WSE values are useful, but they do not tell the whole story. In this reach of the Mississippi River, the WSE is constantly changing. The amount of time spent over a certain elevation (inundation duration) was identified as an important factor this project because different plants and trees have different tolerances for how long they can be inundated.

An inundation duration analysis was completed using 50 years (1974 - 2023) of WSE data at the Chester, IL gage. Determining how long specific WSEs have been continuously exceeded is valuable for determining which species to plant at various elevations, since different species have varying tolerances to prolonged inundation. Definitions of the evaluated statistics are below, and the results of this analysis are presented in **Table 2**.

- <u>percent exceedance</u> the percent of time in the 50 years that the specified WSE has been exceeded (also shown graphically in **Figure 9**),
- <u>event count</u> number of events over 50 years (an event starts when the specified WSE has been exceeded and continues until it drops below the specified WSE),
- minimum duration minimum number of days in one event for the specified WSE,
- maximum duration maximum number of days in one event for the specified WSE,
- average duration average number of days over all events for the specified WSE, and
- median duration median number of days over all events for the specified WSE.

 Table 2. Summary of Inundation Duration Analysis

WSE (ft, NAVD88)	365	370	375	380	385
Percent Exceedance	17.6%	8.5%	2.9%	1.0%	0.3%
Event Count	170	97	42	16	4
Minimum Duration (days)	1	1	1	2	3
Maximum Duration (days)	203	136	73	44	28
Average Duration (days)	19	16	13	11	12
Median Duration (days)	8	7	9	6	8

The combination of information about inundation duration and species tolerances were used to help select the design elevation(s) of project features. Environmental section PDT members used this analysis to target 370 ft-375 ft NAVD88 as a range for the design height of the ridges on which vegetation is to be established. More discussion can be found in Section 7.4 Design Considerations of the main report.

3. Levee Data

There are several levees in the modeled area, as listed below in **Table 3** and shown in **Figure 13**. The levees that have overtopping protection up to at least the 1% Annual Exceedance Probability (AEP) event, have been used as model boundaries to cut down on the size of the model; however, that does mean that this model may be less accurate for events greater than the 1% AEP. The levees that are within the model boundaries have been included in the model (break lines were used to align the cell faces along the levees, as discussed in Section 4.6 Mesh Development. Their elevation was taken from existing LiDAR. Floodwalls and closure structures in St. Genevieve Levee No. 2 and No. 3 were modeled to have a top elevation that is consistent with the top elevation of the levee at that specific location. The other levees within the interior of the model do not have any floodwalls or closure structures. Levee data within this section come from the National Levee Database (USACE and FEMA, n.d.) and were supplemented with data from periodic and routine levee inspections where necessary.

Table 3. Levee Data

Levee System	NLD System ID	≥ or < 1% AEP Overtopping Protection
Prairie Du Rocher and Edgar Lake	5605360001	2
Sainte Genevieve Levee No. 3	5605880001	<
Sainte Genevieve Levee No. 2	5604910001	<
Kaskaskia Island	5605230001	<
Bois Brule	5605030001	2
Grand Tower and Degognia and Fountain Bluff	5605180001	2

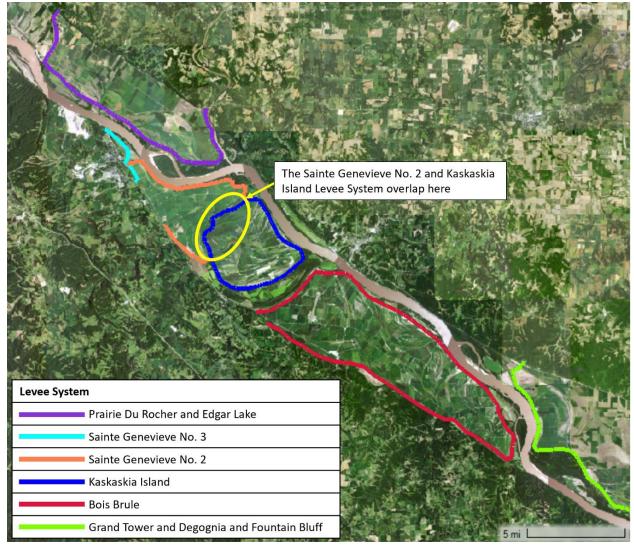


Figure 13. Levees in Modeled Area

4. HEC-RAS 2D Modeling

The Hydraulic Engineering Center River Analysis System (HEC-RAS) version 6.4.1 was used to construct a 2-Dimensional (2D) numerical model of the Horse Island study area. The following sub-sections detail how the model was made and how it was used to evaluate project alternatives.

4.1 Model Extents and Boundary Conditions

The model extends from the upstream end of Sainte Genevieve, Missouri (near RM 125) to the Red Rock Landing Gage (near RM 94) (**Figure 14**). The upstream extent was chosen so that it was upstream of Sainte Genevieve Levee No. 2 and No. 3, because levee data indicated that they may overtop during some modeled events.

Ideally, the Kaskaskia River would be modeled to the extent of Mississippi River backwater in the largest modeled event, and there would be another flow boundary condition at the upstream end of the Kaskaskia River. However, for the 50% AEP, the percent change in flow along the Mississippi River is only 4% from upstream (461,000 cfs) to downstream (480,000 cfs) of the

Kaskaskia River (USACE, 2004). Approximations for backwater along the Kaskaskia River could be made by adding another boundary condition, but this would add model complexity without adding much (if any) model certainty. The downstream extent was chosen because the Red Rock Landing Gage is the first gage after the Chester gage that has current water surface elevation (WSE) data.



Figure 14. Boundary of Modeled Area

4.2 Modeled Flows

A wide range of flows were run through the model during calibration and validation. Lower flows (flows less than the 50% AEP) were modeled by looking at WSEs from Chester in 5-foot increments – more specifically, the most recent daily WSE that was within 0.2 feet of 345 ft, 350 ft, 355 ft, 360 ft, 365 ft, and 370 ft NAVD88 was modeled (along with the corresponding discharge from Chester and WSE at Red Rock Landing). Higher flows corresponding to Annual Exceedance Probabilities (AEPs) from the Upper Mississippi River System Flood Frequency Study (FFFS) (USACE, 2004) were also used. The flow and WSE data for the modeled flows during lower flows (less than 50% AEP) and higher flows (50% AEP and greater) are shown in **Table 4** and **Table 5**, respectively.

Table 4. Modeled Low Flow Conditions

Date	Flow at Chester (cfs)	WSE at Chester (ft NAVD88)	WSE at Red Rock Landing (ft NAVD88)
1/15/2023	107,000	344.98	336.06
8/18/2023	156,000	350.06	341.35
5/31/2023	215,000	354.93	348.36
4/27/2023	291,000	359.81	351.67
6/1/2022	364,000	364.92	357.22
4/16/2021	463,000	370.10	362.61

 Table 5. Annual Exceedance Probabilities at Chester and Red Rock Landing (USACE, 2004)

Annual Exceedance Probability (%)	Flow at Chester (cfs)	WSE at Chester (ft NAVD88)	WSE at Red Rock Landing (ft NAVD88)
50	480,000	371.88	362.96
20	622,000	377.38	368.96
10	707,000	380.48	371.66
4	805,000	383.78	374.76
2	893,000	386.78	377.86
1	948,000	388.68	379.46

Note: WSEs were originally reported in the FFFS in National Geodetic Vertical Datum of 1929 (NGVD29). They were converted to NAVD88 using a conversion factor of -0.32 feet and -0.54 feet at Chester and Red Rock Landing, respectively.

4.3 Initial Conditions and Equations

The model was set with a ramp-up time of 4 hours and a ramp-up fraction of 0.25. This means the model warm-up period consists of 1 hour building from zero flow to the first flow value in the hydrograph, then three hours of maintaining that flow before the simulation begins. Once the model was setup, it was run with both the Diffusion Wave and Shallow Water Eulerian-Lagrangian equations (SWE). There were significant differences (about 1 foot) in the WSE results from these runs, so the SWEs were used for the rest of the modeling, as suggested by HEC-RAS 2D User's Manual (United States Army Corps of Engineers, n.d.).

4.4 Terrains

The existing conditions terrain uses US Geological Survey (USGS) topobathy in the main channel and LiDAR ground elevation outside of the main channel (see **Figure 15** and **Table 6**). Using a combination of ArcGIS Pro version 3.1.1 and Global Mapper Pro version 23.0, the elevation data was converted to the North American Vertical Datum of 1988 (NAVD88) (feet) and horizontal coordinate system was reprojected into North American Datum of 1983 (NAD83) State Plane MO East (US survey feet), then the data sources were layered and merged together. For the purposes of determining the main channel, a polygon shapefile of the

Mississippi River 'shoreline' was used with the 'Erase' tool and an Island shapefile to create a clipping boundary. Lastly, the data was brought into RAS Mapper, and the horizontal coordinate system was reprojected into NAD83 State Plane IL West (US survey feet) to be in line with the Geospatial Data Management Plan.

LiDAR was collected within the project area in November of 2024, but it was not available in time to incorporate in the hydraulic model during feasibility. The new LiDAR data will be incorporated in the model during Preconstruction, Engineering and Design (PED). Adding recent main channel comprehensive and side channel surveys will also be considered during PED.

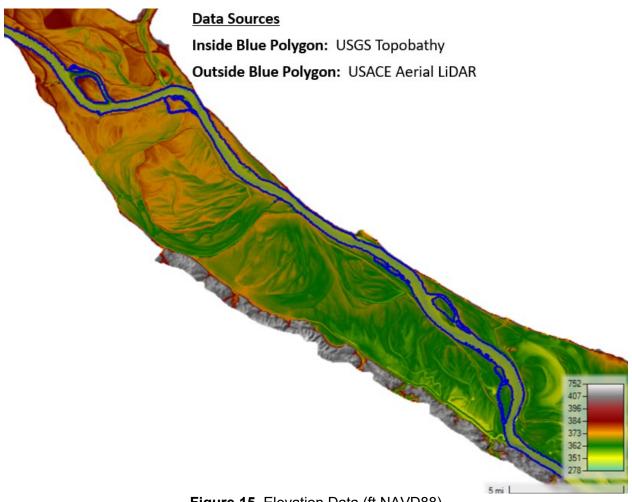


Figure 15. Elevation Data (ft NAVD88)

Table 6. Elevation Data Sources

SOURCE	SURVEY DATE	COORDINATE SYSTEM	VERTICAL DATUM
USGS TOPOBATHY (SURVEY, N.D.)	2006-2010	NAD 1983 UTM Zone 15N (m)	NAVD88 (cm)
USACE AERIAL LIDAR	2016	NAD 1983 State Plane MO East (US feet)	NAVD88 (ft)

4.5 Roughness Values

Manning's n roughness values chosen for this model were assigned according to 2021 National Land Cover Database (NLCD) land cover designations. The NLCD has a 30-foot by 30-foot resolution. Since the focus of this model is outside of the main channel, this resolution was deemed appropriate, and roughness values were adjusted in the project area for proposed conditions. The HEC-RAS 2D User's Manual gives ranges for each of these land cover designations (United States Army Corps of Engineers, n.d.). The mid-point value for each range was chosen as the representative manning's n-value in this model, besides for the open water value, which was adjusted for model calibration. While the mid-point of the suggested range was chosen, Manning's n-values are based on empirical data and site-specific conditions at any given time, such as the season. Further refinement of manning's n-values (other than open water) were not deemed necessary for this model effort; however, it could be useful to look at the sensitivity of these values during PED (particularly for the dominant land cover types within the project area). Table 7 and Figure 16 show the model's roughness values and their respective areas. After the model had been calibrated, the 2023 NLCD land cover data became available. The model was updated with the 2023 NLCD data near the project area, but not in the main channel. This allowed the model to have the newest land cover in the project area without having to recalibrate the hydraulic model. The value (and potential updating) of using the 2023 NLCD data for the entire model should be evaluated during PED.

Land cover designations were also collected with the November 2024 LiDAR collection. During PED, the land cover designations will be compared to the NLCD data. After viewing the resolution and accuracy of the November 2024 land cover data, model updates will be made if they will provide added value to the project.

 Table 7. Roughness Values for Land Cover Type

Land Cover	Manning's N-value Range	Manning's N-value for Calibration
Open Water	0.025-0.050	0.031
Barren Land Rock-Sand-Clay	0.023 - 0.030	0.027
Grassland-Herbaceous	0.025 - 0.05	0.038
Pasture-Hay	0.025 - 0.05	0.038
Cultivated Crops	0.020 - 0.05	0.035
Woody Wetlands	0.045 - 0.15	0.098
Emergent Herbaceous Wetland	0.05 - 0.085	0.068
Shrub-Scrub	0.07 - 0.16	0.120
Developed, Open Space	0.03 - 0.05	0.040
Developed, Low Intensity	0.06 - 0.12	0.090
Developed, Medium Intensity	0.08 - 0.16	0.120
Developed, High Intensity	0.12 - 0.20	0.160
Mixed Forest	0.08 - 0.20	0.140
Deciduous Forest	0.10 - 0.20	0.150
Evergreen Forest	0.08 - 0.16	0.120

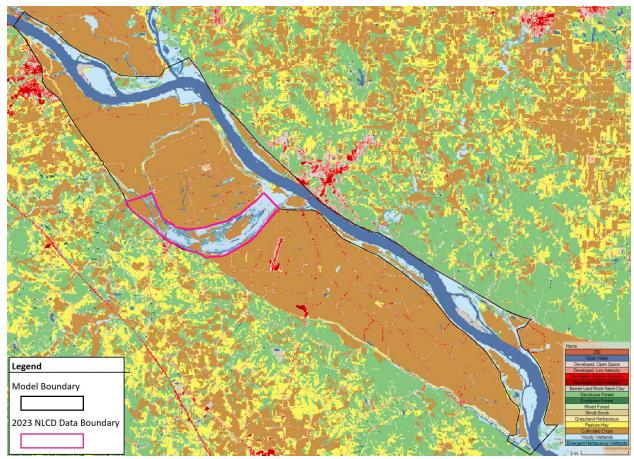


Figure 16. Land Cover Classification Geometry

4.6 Mesh Development

HEC-RAS 2D modeling works based on a 2D area coverage with an elevation source divided into smaller computational units called cells. Each cell is defined by the volume bounded by its faces, the provided elevation surface, and the calculated water surface. Running a 2D flow simulation will then output WSE and velocity values across the faces of each cell. Since these cells are treated as individual volumetric elements and not singular computational points, it is important that these cells are aligned with the direction of flow in the model and that they are of an appropriate size for the type of flow being simulated. Supercritical flow can cause computational issues in models; this can be overcome by assigning sufficiently large cell sizes near inflow boundary conditions that may be supercritical. Cells that are wetting and drying within a simulation run can also cause computational iterations. This can be mitigated by aligning cell faces along the wetted perimeter of the bank and using larger cell sizes for overbank shallow water areas prone to wetting/drying.

Cells were generated to form the model mesh with a base cell size of 200 ft by 200 ft, and a refinement region was added around the main channel of the Mississippi River and the project area with a cell size of 100 ft by 100 ft. Additionally, break lines were drawn along the center of the main channel and old channel of the Mississippi River (to align cells with the direction of flow), levees, riverine structures, and other sharp changes in elevation. The cell size along the break lines was reduced to 25 ft by 25 ft to prevent flow from jumping from cell to cell unrealistically (or 'leaking'). After generating the mesh, manual edits to problematic cells were

made where applicable. Further mesh refinements, such as break lines along ridges and swales, may be added during PED once the alignment is finalized.

4.7 Model Calibration and Validation

The hydraulic function of Horse Island is primarily driven by WSE fluctuation and backwatering from the main stem of the Mississippi River, so the model was calibrated and validated to WSEs associated with the nearby Chester, IL gage. However, this only calibrates and validates the model results in the main channel, not in the project area. Additionally, there is no gage data within the project area (only nearby at Chester) to help verify results. Aerial imagery was used to further validate the results of the model in the project area.

4.7.1 Model Calibration

The model was calibrated to three of the Low Flow events with WSEs of approximately 360 ft, 365 ft, and 370 ft NAVD88 at the Chester gage. These specific elevations were chosen because they are when water has nearly filled the old main channel (360 ft), started flooding the Horse Island area (365 ft), and flooded the Horse Island area (370 ft), as shown in **Figure 17**. The WSEs for calibration were chosen relatively early in the discussion of environmental benefits; however, it the greatest environmental benefit was expected to occur somewhere between the 360 ft and 370 ft WSEs when the Horse Island area has water depths of a few feet.

Since the flooding of the Horse Island area is largely dependent on the WSE in the main channel leading to backwater, the calibration of velocities along the main channel of the Mississippi River are less critical than WSE calibrations for this project. However, there were discussions of additional calibration and/or validation with velocity data along the main channel of the Mississippi River in the modeled area. To save time and money, historical Acoustic Doppler Current Profiler (ADCP) data throughout this reach was evaluated; however, after further investigation, the available datasets did not provide adequate data in the main part of the channel to be useful for this model's purposes. Additionally, it would be best to collect ADCP during the flow conditions used for calibration (when WSEs are between 360 ft and 370 ft NAVD88 at the Chester gage). If budget allows, ADCP data may be collected along the main channel near the inlet of water into Horse Island (between RMs 109 and 113) when WSEs are between 360 ft and 370 ft NAVD88 at the Chester gage. If this ADCP data is collected, it will be incorporated into the model during PED.

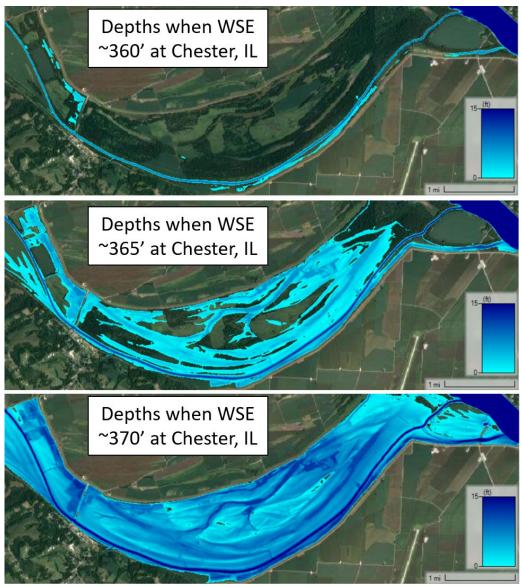


Figure 17. Depth Grids for Calibration Flows

To achieve calibration, the Manning's n-value for the main channel was altered to minimize the difference in WSE between the measured and modeled for these three events. Root mean square error (RMSE), which measures the spread of difference between two related sets of data, was used to analyze the differences in measured and modeled WSE outputs. The individual differences are aggregated to produce a single RMSE value, calculated using the following equation:

$$RMSE = \sqrt{\frac{\sum_{i=1}^{n} (x_{measured,i} - x_{modeled,i})^{2}}{n}}$$

Where $x_{measured}$ is the measured value, $x_{modeled}$ is the modeled value, and n is the number of model data pairs. RSME was calculated for each n-value that was modeled. The calibrated n-value was chosen to be the n-value with the closest RMSE value to zero. An n-value of 0.031 was chosen for the main channel to minimize this difference. Results of the analysis can be seen in **Table 8**.

Table 8 Measured versus	Modeled WSE Comparison	at Chester for Calibration
i able o. Measured versus	MODELEG MACE COLLIDATION	i at Chester for Cambration

Date	Measured WSE	Modeled WSE (n = 0.030)	Measured minus Modeled (n = 0.030)	Modeled WSE (n = 0.031)	Measured minus Modeled (n = 0.031)	Modeled WSE (n = 0.032)	Measured minus Modeled (n = 0.032)
4/27/2023	359.81	359.80	0.01	360.12	-0.31	360.43	-0.62
6/1/2022	364.94	364.57	0.37	364.88	0.06	365.18	-0.24
4/16/2021	370.12	369.90	0.22	370.20	-0.08	370.50	-0.38
		RMSE =	RMSE =	RSME =	RSME =	RSME =	RSME =
		0.25	0.25	0.19	0.19	0.44	0.44

4.7.2 Model Validation to 'Low Flows' and AEPs

The model was validated to remaining Low Flow Event WSEs (WSEs of approximately 345 ft, 350 ft, and 355 ft NAVD88 at the Chester gage) and flow exceedance probabilities 50%, 20%, 10%, 4%, 2%, and 1% based on the 2004 FFFS (USACE, 2004). The results of validation are shown in **Table 9** and **Table 10** for the Low Flows and AEP flows, respectively. Lastly, all the WSE and flow datasets from the 'low flow' events and AEP values were compared against the last ten years of gage data at Chester (data since January 1, 2014) in **Figure 18**. The calibrated model more closely matches the WSEs for the 'low flow events' than for the FFFS AEPs, as expected since the calibration was focused on lower flows. **Figure 18** goes a step further to compare these WSEs to the last ten years of measured gage data, since the FFFS WSEs were published in 2004. The 50-, 20-, 10-, and 4-% AEPs FFFS and modeled WSEs fall along the last ten years of gage data; however, for the 2- and 1-% AEP events, the modeled WSEs closer match the last ten years of gage data than the FFFS WSEs.

Table 9. Measured Low Flows versus Modeled WSE Comparison at Chester for Validation

Date	Measured WSE (ft NAVD88)	Modeled WSE n = 0.031 (ft NAVD88)	Measured minus Modeled (ft)
1/15/2023	344.98	345.70	-0.72
8/18/2023	349.96	350.55	-0.59
5/31/2023	355.44	355.76	-0.32

Table 10. AEP versus Modeled WSE Comparison at Chester 1

AEP (%)	AEP WSE (ft NAVD88)	Modeled WSE n = 0.031 (ft NAVD88)	AEP minus Modeled
50	371.88	370.79	1.09
20	377.38	376.73	0.65
10	380.48	379.62	0.86
4	383.78	382.72	1.06
2	386.78	385.86	0.92
1	388.68	387.56	1.12

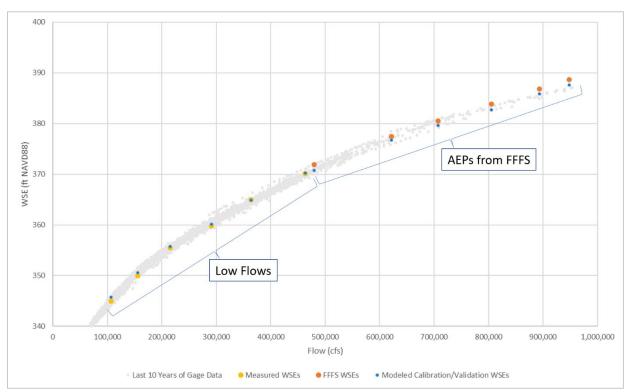


Figure 18. Modeled WSEs plotted with the Last 10 Years of Gage Data at Chester, IL

4.7.3 Model Validation to Aerial Imagery

In lieu of more traditional calibration/validation data within the project area, the inundation boundary from aerial imagery on a specific date was compared to the inundation boundary from model results (where the boundary conditions corresponded with the aerial imagery's collection date).

For this analysis, aerial imagery needs to be from a day when there is some water on the project area but not completely covering the area (WSEs at the Chester gage of about 363 ft, 365 ft, and 367 ft were used); this condition allows for inundation boundaries to be more easily compared. Days with rising WSEs were preferred to falling WSEs to minimize the amount of

ponded water (from previously higher water) in the aerial imagery. The collection time of the aerial imagery was not provided, so water levels fluctuating throughout the day could be another error source. Lastly, the gage data used for the aerial imagery validation is 2-5 years newer than the terrain data (gage data is from 2018 – 2021, and LiDAR is from 2016). This could be remedied by collecting new LiDAR and imagery that corresponds to more recent data, but it was determined that a higher level of precision is unnecessary at this time. Given the number of error sources with this method, minimal weight should be given to these results; however, the Hydrologic and Hydraulics (H&H) team members believed that this still provided value in showing that the model was showing similar results to what was observed by the aerial imagery.

Aerial imagery was obtained from the Sentinel satellite via the Copernicus browser. Sentinel captures aerial imagery in this area multiple times a week; however, days with excessive cloud cover could not be used. After identifying clear days that experienced the WSEs of interest, listed in **Table 1**, the aerial imagery was downloaded and georeferenced in ArcGIS Pro using control points. The model was then run with the corresponding WSEs and flows from gage data for the days of interest. The inundation boundary was generated in HEC-RAS and overlayed onto the georeferenced aerial images for a visual comparison of the modeled and observed conditions within the project area. Results are shown as follows in **Figure 19**, **Figure 20**, and **Figure 21**.

Table 11. Modeled Aerial Imagery Days

Date	Flow at Chester (cfs)	WSE at Chester (ft NAVD88)	WSE at Red Rock Landing (ft NAVD88)
01/01/2020	335,000	362.86	354.55
02/25/2018	377,000	365.01	355.51
03/29/2021	410,000	367.03	358.97

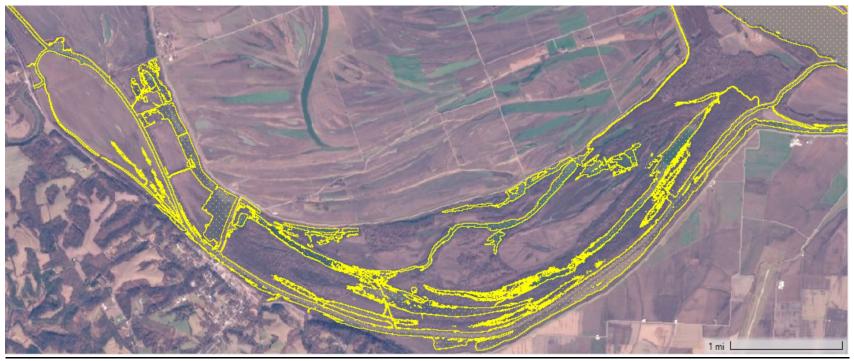


Figure 19. Inundation Boundary Comparison for WSE at Chester of ~363 ft NAVD88 on January 01, 2020



Figure 20. Inundation Boundary Comparison for WSE at Chester of ~365 ft NAVD88 on February 25, 2018



Figure 21. Inundation Boundary Comparison for WSE at Chester of ~367 ft NAVD88 on March 29, 2021

The results are more easily compared for the two lower water surface elevations (**Figure 19** and **Figure 20**) because the water is mostly inundating unforested areas. When the water starts inundating forest areas (**Figure 21**) the boundaries become increasingly difficult to compare because the water depth is likely lower than the treetops. For the two lower WSEs, the boundaries are similar between modeled and observed; similar amounts of the project area are inundated, and for the most part, the same areas are inundated. Slight variations are expected because of the previously stated error sources. For the higher WSE, it appears (from both the model and the aerial imagery) that the project area is nearly, but not completely, covered in shallow depths of water. No changes were made to the model due to the aerial imagery validation analysis; however, the aerial imagery validation analysis added confidence to the model's overall accuracy within the project area.

4.8 TSP Modeling

The alternatives for this project build upon themselves, with the Maximum alternative (which is also the TSP) having all the proposed features included. Given the location of the project (outside of the main channel) and the alternatives building upon themselves, extensive alternatives testing was not necessary.

There were two types of model modifications to incorporate the TSP: terrain edits and land cover changes. Terrain modification tools within RAS Mapper were used to incorporate ridges and swales. The terrain modifications will need further refined during PED after the Civil PDT member creates a 3D model.

Within the project area, there are patches of land that have the desired land cover (this was identified during a site visit in October of 2023). These patches were assigned a land cover type of Woody Wetland by the NLCD. The proposed project land cover could be more accurately described as a wetland forest; however, after consulting with the forester assigned to the project, it was deemed most reasonable to use the Woody Wetland land cover designation to make with-project and without-project conditions comparable. Land cover edits to represent project features are as described in **Table 12**.

Note that Manning's n-values are empirically-based, and there is a lot of engineering judgement used when determining them (see Section 4.5 Roughness Values for more information). Factors like season, tree density and diameter; which will vary over the life of the project; could make differing Manning's n-values justifiable. As discussed further in Section 5.1 No-Rise and Potential Takings Analysis, the choice for Manning's n-values can have large implications when it comes discussing no-rise requirements.

Table 12. Manning's n-value for Project Features

Features	Land Cover	Manning's N-value
Tree Planting, Forest Stand Improvement (FSI), Ridges	Woody Wetland	0.098
Swales, Wetland Restoration	Emergent Herbaceous Wetland	0.068

5. Project Impacts

This project's features are expected to have minimal impacts to the surrounding area. The topographic change from ridge and swale construction will have localized impacts to the movement of water, which will be most notable when project area is beginning to flood (WSEs on the Chester gage between approximately 365 ft and 370 ft). Tree planting is expected to increase the roughness in the planting areas. Increases in roughness can have impacts to the water surface elevation, which vary based on the land cover type, the geometry or topography, and velocity within the area.

The project area is surrounded by levees on all sides other than at the southeast end where it connects to the main stem of the Mississippi River. Water from the main stem of the Mississippi River backwaters into the project area. These levees are captured within the hydraulic model, but while modeling gives insight on which levees overtop at what event, this information should be used with some level of caution because the difference between modeled and measured WSEs for the AEP events varies from 0.65 to 1.12 feet (see Section 4.7 Model Calibration and Validation), which could cause discrepancies between the event the levees overtop at in the model versus in an observed event.

Model results indicate that the levees contain the water through to the 10% AEP event, when the southern portion of the Sainte Genevieve Levee No. 2 begins to overtop. At the 4% AEP event, there is a significant amount of water on the interior of Sainte Genevieve Levee No. 2. The water within the interior of the levee and the project area has minimal velocity at these events. At the 2% AEP event, the north end of the Sainte Genevieve No. 2 levee is overtopping from high WSEs on the main stem of the Mississippi River. For this event and larger, there are larger (less than 1 cfs) velocities in the project area.

When there are minimal velocities (approximately flows less than the 4% AEP) in the project area, the model indicates no rise in the project or surrounding areas. When there are higher velocities (approximately flows higher than 2% AEP) small rises in water surface elevation are seen in the project and surrounding areas. However, the water depths are high enough that the small rises observed are less than 1% percent of the total depth at the 1% AEP event. With small changes to WSE and low velocities, negative impacts to navigation and the surrounding levees are not expected.

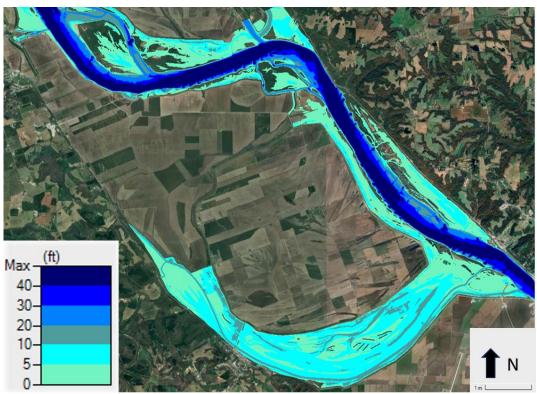


Figure 22. TSP Maximum Water Depth for 50% AEP

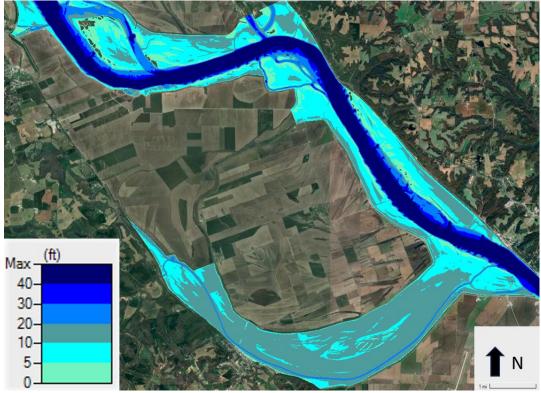


Figure 23. TSP Maximum Water Depth for 20% AEP

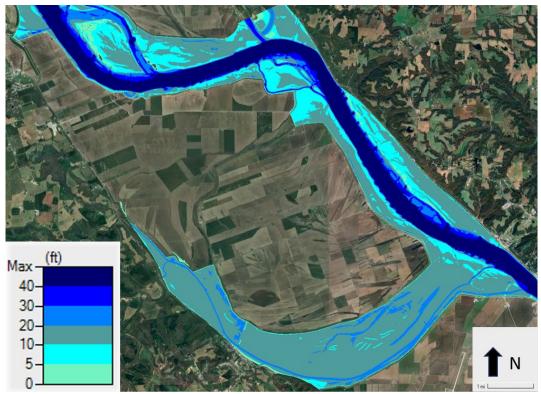


Figure 24. TSP Maximum Water Depth for 10% AEP

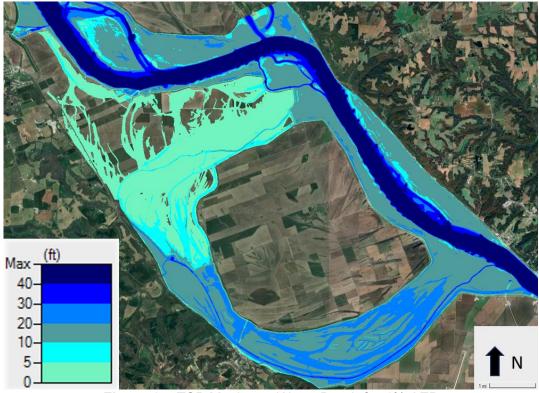


Figure 25. TSP Maximum Water Depth for 4% AEP

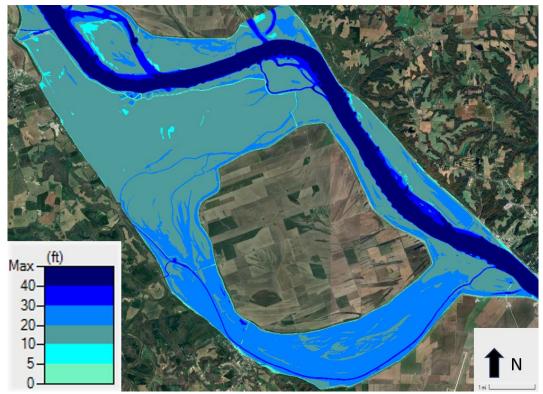


Figure 26. TSP Maximum Water Depth for 2% AEP

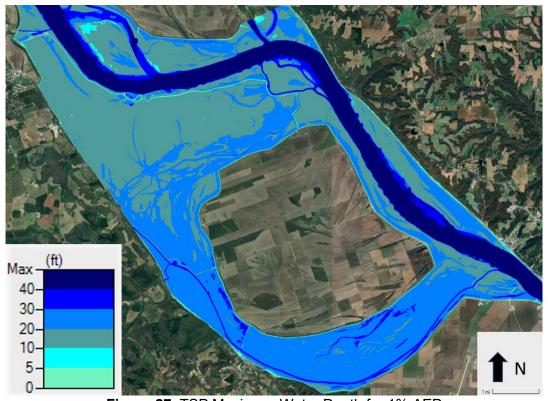


Figure 27. TSP Maximum Water Depth for 1% AEP

5.1 No-Rise and Potential Takings Analysis

A "no-rise" certification may be needed for this project. Illinois Department of Natural Resources (IDNR) was consulted in January of 2025 regarding this potential project. From that meeting, the PDT learned that a hydraulic model may not be necessary for obtaining a no-rise permit; however, if it is required, only topographic changes (ridges and swales) should be accounted for in the model. Changes to land cover (from planted vegetation) is not regulated by IDNR, and therefore, it should not be accounted for in the model.

USACE guidance is evolving on takings analysis. Coordination between the St. Louis District Hydrologic and Hydraulics Branch and St. Louis District Office of Counsel is ongoing.

5.2 Navigation

The proposed conditions were analyzed for potential impacts to the 9 ft deep and 300 ft wide navigation channel authorized for the Mississippi River in the St. Louis District. Impacts to the navigation channel could be, but are not limited to, an increased need for dredging or unexpected changes in channel alignment. Looking at both a low flow (WSE ~365 ft at the Chester gage) and the 1% AEP, this was checked in at three locations (**Figure 28**) in two ways. These three locations capture the main channel where 1) the largest difference in water surface elevation is seen in the main channel due to levee overtopping during the 1% AEP (the most upstream cross section), 2) the main channel adjacent to Kaskaskia Island where affects could be seen if there was a large difference in flow through the project area (middle cross section), and 3) the main channel downstream of the project area. At each of these cross sections there was 1) a comparison of flow in the main channel between the existing and proposed conditions, and 2) the difference of velocities in the main channel between the existing and proposed conditions.



Figure 28. Location of Cross Sections for Assessing Potential Navigation Impacts

As discussed previously in Section 5. Project Impacts, model results indicate that the surrounding levees contain water through to the 10% AEP event, when the Sainte Genevieve Levee No. 2 begins to overtop. For flow events when levee is containing the water, no impacts to navigation can be expected. Velocities are minimal through the project area (only backwater from the Mississippi), so water surface elevations are not impacted by the project. The only expected hydraulic changes are localized changes around the ridges and swales, thus, changes to navigation are not expected. This was further validated by the model – as changes to flow and velocities at each cross section (**Figure 28**) were negligible (no noticeable change to flow, less than 0.1 ft/s changes to velocity).

For the larger events, the roughened project area (from tree plantings) could slightly decrease the projects areas flow capacity and cause small changes to the water surface elevation. At the three evaluated cross sections from **Figure 28** this causes negligible changes to flow (less than 1% change) and velocity (less than 0.1 ft/s change) in the main channel.

In summary, the proposed conditions are assessed to have no negative impacts to navigation, since there are no significant changes in flow or velocity within the navigation channel. Additionally, with the lack of significant changes to flow and velocity through the navigation channel, it has been assessed that there should be minimal impacts to sediment transport in the

navigation channel; therefore, there should not be an increased need for navigation channel dredging due to these proposed measures.

6. Conclusions

In summary, a HEC-RAS model was used to develop alternatives and evaluate the TSP for Horse Island. The calibration and validation effort yielded WSEs within 1.12' of gage data at Chester, Illinois for all modeled events. Results of this hydraulic model were then used to develop the project alternatives and evaluate their effect on the surrounding area. Preliminary modeling of the TSP does not show any negative impacts to navigation or any significant WSE rise (as it pertains to obtaining a permit from IDNR). Guidance related to a potential takings analysis has not been received – once received, the guidance will need to be applied to the project.

The H&H PDT team member is expected to have an active role in PED. Expected H&H tasks during PED are, but are not limited to, the following:

- Inclusion of new LiDAR in the hydraulic model
- Consideration, and potential inclusion, of new comprehensive main channel and side channel surveys in the hydraulic model
- Alteration of geometry to account for new Chester bridge (currently under construction) and the bridge from St. Mary to Kaskaskia Island
- Inclusion of 2023 NLCD data in hydraulic model
- Evaluation, and potential inclusion, of newly collected (January 2024) land cover data
- Evaluation of sensitivity to Manning's n-values within the project area to better explain uncertainties with pre- and post-project water surface elevations
- Further aerial imagery validation of the project area after the models topographic and land cover data is updated
- If available during PED, potential calibration or validation to updated AEP events for the Mississippi River
- Potential in-depth evaluation of when (or at what event) and where levees should overtop
- Inclusion of detailed ridge and swale configurations (to be provided by Civil PDT member)
- Potential adjustment of mesh within project area around ridge and swale features
- Conduct a no-rise analysis in coordination with IDNR
- Potentially conduct a takings analysis (based on future guidance)

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Appendix B – Civil Design

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APPENDIX B - CIVIL DESIGN

B.1 EXISTING CONDITIONS

B.1.1 Site Access

The refuge is accessible via public roads with smaller access roads reaching further into the refuge. It is anticipated these access roads will be utilized during construction with some traversing over land required by offroad construction equipment. It's important to note that ridge and swale cut and fill quantities will balance by specific complex. No significant hauling of material is anticipated, except for the low-water crossing construction. Soil materials present on the site appear/are assumed to be suitable for ridge construction, so no spoil is anticipated.

The "Center East" ridge and swale complex is located in an area surrounded by trees with an existing swale making up the western boundary. This complex may require a temporary crossing to facilitate mobilization of construction equipment. An existing road crosses the slough that is in drivable condition and is assumed to be usable during construction. The sponsor has not expressed concerns with its presence, so no removal or modification of the existing crossing has been proposed beyond minimal crushed stone surfacing, accounted for in the quantities. Another existing crossing is assumed not available for use in construction, as it is located on the private inholding and would require an additional easement. A riprap berm with crushed stone surfacing was included in the quantities for cost estimating purposes. Further consideration to this crossing may be required during PED.

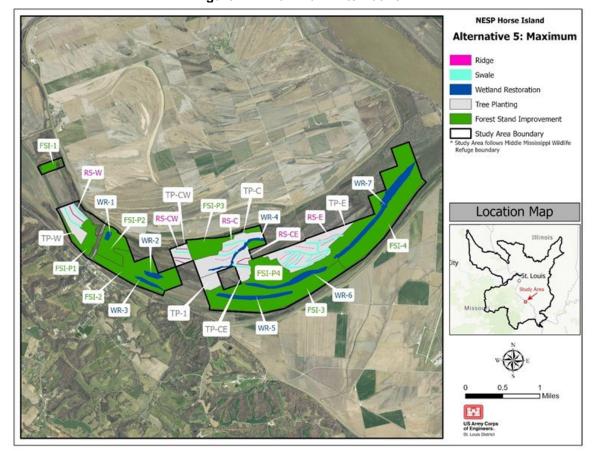


Figure B-1. Maximum Alternative

Note: Ridge and Swale complexes are denoted "RS" with the complex code to follow (e.g. Center East Ridge and Swale is RS-CE)

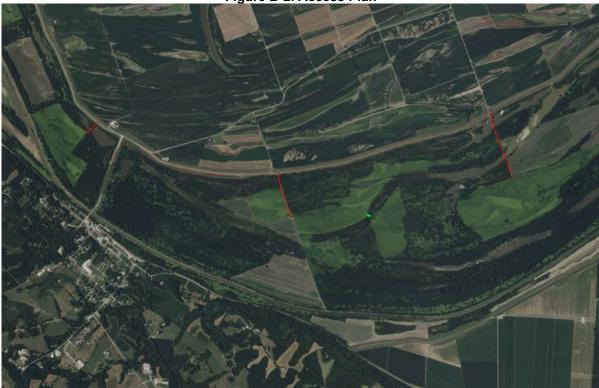


Figure B-2. Access Plan

Note: Existing roads are shown in red. Temporary crossing shown in green.



Figure B-3. Approximate Low-Water Crossing Location

B.1.2 Materials

The temporary low-water crossing is assumed to be constructed of R140 Riprap as a conservative placeholder. The swale does not receive significant flow, and the crossing will be removed after construction, so a smaller or more well-graded and lower-quality stone may be allowable. It is assumed that no culverts or fish passage features will be needed for the temporary structure.

B.1.3 Structures

The refuge is passively managed with no major water control structures or other means to control water levels within the refuge. This level of management is desired to continue, and the proposed measures reflect that approach.

B.1.4 Utilities

No known utilities exist within the project site.

B.2 MEASURES

B.2.1 Ridge and Swales

Ridge and swales were estimated using the NESP Environmental Design Toolkit. Top of ridge elevations were provided by forestry experts on the team in collaboration with USFWS staff. Shallow slopes are desired for both the ridges and swales. A summary of the dimensions used to estimate ridge and swales is below.

Table B-1. Ridge Dimensions

Complex Name	Length (ft)	Top Elev (ft)	Crown Width (ft)	Side Slope (#H:1V)
West	1600	375	20	10
Center West	2700	370	20	10
Center Center	2575	371.5	20	10
Center East	1850	375	20	10
East	9500	375	20	10

Note: Dimensions are for estimating purposes. Further design considerations will be taken during PED.

Table B-2. Swale Dimensions

Complex Name	Length (ft)	Bottom Elev (ft)	Bottom Width (ft)	Side Slope (#H:1V)
West	3400	363	80	20
Center West	1050	361	80	20
Center Center	3050	361	80	20
Center East	1320	365.5	80	20
East	14350	363	80	20

Note: Dimensions are for estimating purposes. Further design considerations will be taken during PED.

Further detailed modeling will take place during PED. It's important to note that the layout using the dimensions above approximately fill the cleared areas available for ridge and swale construction. Meaning, if wider crown or bottom widths are desired, side slopes will likely need

to be steepened. Conversely, if shallower slopes are desired, crown width and or bottom widths will need to be shortened.

B.3 BORROW AND EXCESS PLACEMENT

Each complex of ridge and swales was estimated to be cut/fill balanced. This consideration will be carried into PED as the design of the ridge and swales is refined. Therefore, no borrow or placement of excess material is anticipated. Flexibilities may be worked into the contract to further solidify there will be no need for additional borrow or placement areas.

B.4 PRECONSTRUCTION ENGINEERING DESIGN CONSIDERATIONS

- A few discrete locations contain artificial berms that pond small area of water. Swale
 excavation will possibly cut through these berms and open drainage. However, if swale
 alignment does not remove these, consideration should be given to include degrading or
 removing these berms as part of the plans and specifications with concurrence from the
 sponsor. The required earthwork is minimal and did not justify inclusion as a separate
 measure for this report.
- Staging will be further considered. Quantities for a staging area were estimated, however no location was chosen as part of the report. A staging location is not anticipated to be a challenge as the likely locations would be along existing roads into the refuge in areas already free of tree cover.
- As discussed above, access will be further examined during PED including the location
 of the temporary crossing to Center East. Additionally, material type required for
 temporary crossing will need further investigation, including selection and design of
 revetments, if used.
- Stripping of entire ridge and swale footprints was included in the TSP cost estimate as part of design refinement. Further consideration should be given to the necessity of stripping during the next team site visit.

B.5 QUANTITIES

B.5.1 Alternative Analysis Quantities

Table B-3. Minimum 1 Quantities

	Table 6-3. Minimum T Quantities						
			140lb				
Measure	Cut	Fill	Topsize RR	Geotextile	Aggregate	Stripping	Seeding
	ВСҮ	CCY	TN	SY	TN	AC	AC
Site Work				920	257	1	
Ridges & Swales	-	-					-
Tree Planting							
Forest Stand							
Improvement							
Wetland							
Restoration							
Totals:	-	-	-	920	257	-	-

Table B-4. Minimum 2 Quantities

			140lb				
			Topsize				
Measure	Cut	Fill	RR	Geotextile	Aggregate	Stripping	Seeding
	ВСҮ	CCY	TN	SY	TN	AC	AC
Site Work				920	257	-	
Ridges & Swales	301,479	299,991					128
Tree Planting							
Forest Stand							
Improvement							
Wetland							
Restoration							
Totals:	301,479	299,991	-	920	257	-	128

Table B-5. Intermediate 1 Quantities

	-	-	140lb	e i Quantiti			
			Topsize				
Measure	Cut	Fill	RR	Geotextile	Aggregate	Stripping	Seeding
	ВСҮ	CCY	TN	SY	TN	AC	AC
Site Work				920	257	-	
Ridges & Swales	301,479	299,991					128
Tree Planting							
Forest Stand Improvement							
Wetland Restoration							
Totals:	301,479	299,991	-	920	257	-	128

Table B-6. Intermediate 2 Quantities

			140lb				
			Topsize				
Measure	Cut	Fill	RR	Geotextile	Aggregate	Stripping	Seeding
	ВСҮ	CCY	TN	SY	TN	AC	AC
Site Work				920	257	-	
Ridges & Swales	347,990	344,109					150
Tree Planting							
Forest Stand Improvement							
Wetland Restoration							
Totals:	347,990	344,109	-	920	257	-	150

Table B-7. Intermediate 3 Quantities

			140lb	e 5 Quantitie			
			Topsize				
Measure	Cut	Fill	RR	Geotextile	Aggregate	Stripping	Seeding
	ВСҮ	CCY	TN	SY	TN	AC	AC
Site Work				920	257	-	
Ridges & Swales	382,457	377,813					170
Tree Planting							
Forest Stand							
Improvement							
Wetland							
Restoration							
Totals:	382,457	377,813	-	920	257	-	170

Table B-8. Maximum Quantities

			140lb				
			Topsize				
Measure	Cut	Fill	RR	Geotextile	Aggregate	Stripping	Seeding
	ВСҮ	CCY	TN	SY	TN	AC	AC
Site Work				920	257		
Ridges & Swales	414,455	411,146					184
Tree Planting							
Forest Stand Improvement							
Wetland Restoration							
Totals:	414,455	411,146	•	920	257	-	184

B.5.2 TSP Design Refinement Quantities

Table B-9. Refined TSP Quantities

			140lb				
			Topsize				
Measure	Cut	Fill	RR	Geotextile	Aggregate	Stripping	Seeding
	BCY	CCY	TN	SY	TN	AC	AC
Sita Mark			1 470	020	1 227	104	
Site Work			1,470	920	1,327	184	
Ridges & Swales	414,455	411,146					184
Tree Planting							
Forest Stand							
Improvement							
Wetland							
Restoration							
Totals:	414,455	411,146	1,470	920	1 227	184	184
Totals:	414,455	411,140	1,4/0	320	1,327	104	104

Appendix C – Habitat Evaluation

1. Introduction

This appendix provides the documentation of the habitat evaluation and quantification process that was conducted to evaluate the benefits of various alternatives for the Navigation and Ecosystem Sustainability Program (NESP) Horse Island ecosystem restoration project. The evaluation was conducted by a multi-agency team with active participants that included biologists from the St. Louis District U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Missouri Department of Conservation, and from the Illinois Department of Natural Resources.

2. Habitat Benefit Evaluation Methodology

The purpose of the habitat benefit evaluation is to evaluate and quantify, to the extent possible, environmental benefits of alternative plans for the habitat improvements within the study area. Habitat benefits were quantified through the use of the Engineering Circular 1105-2-412, *Assuring Quality of Planning Models* and the Upper Mississippi River System Floodplain Forest Habitat Model (USACE, 2021) and the Yellow Warbler Habitat Suitability Index Model.

The Floodplain Forest Habitat model is certified for regional use in the Upper Mississippi River system by the USACE Ecosystem Restoration Planning Center of Expertise (ECO-PCX). The Habitat Suitability Index (HSI) calculator for the Floodplain Forest Habitat model was reviewed by the Ecosystem Restoration Planning Center of Expertise and was recommended for regional use (Memorandum for Commander, Mississippi Valley Division, 16 August 2021).

The Yellow Warbler model is certified for regional use by the USACE ECO-PCX (Schroeder, 1982).

Consistent with guidance from the USACE Ecosystem Restoration Planning Center of Expertise, the Agency Technical Review (ATR) Team for the NESP Horse Island ecosystem restoration project will assess the models used for this project. This process will evaluate the technical quality and appropriateness of the models utilized. Traditionally, the USACE has used the quantity and quality of habitat jointly, in the form of habitat units, to measure the benefits provided by ecosystem restoration projects.

A. Floodplain Forest Model

The model was developed by an interdisciplinary team from St. Paul, Rock Island, and St. Louis Districts. It provides an evaluation tool that can accurately capture the habitat changes associated with routine forestry techniques used in the region and thus provides a tool capable of quantifying benefits resulting from these techniques. The model consists of five variables representing the quality and health of floodplain forests: percent canopy cover, percent desired forest type, percent invasive species, regeneration, and structural diversity. The model was designed to be applicable across young, mature, and old forests found across the region, and can be used for all forest community types, including diverse forest communities and variable flooding regimes, found in the system (USACE, 2021).

This model consists of Habitat Suitability Index curves for the four of the five above-mentioned habitat variables: percent canopy cover, percent desired forest type, percent invasive species cover, and regeneration. These habitat variables will be influenced by the implementation of forest stand

improvement (FSI), ridge & swale construction, and tree planting across the island. The qualitative component of the analysis uses HSI curves. HSI curve equations are used in conjunction with corresponding information to compute a total HSI score that ranges between 0.0 (poor quality or complete lack of habitat) to 1.0 (high quality or "perfect" habitat) (Figure 1). The HSI for a particular habitat type is determined by selecting values that reflect existing (Year 0) and future study area conditions (Years 1-50) from a series of metrics. Each value corresponds to a suitability index for the species. Future values are determined using management plans, historical conditions, and best professional judgment.

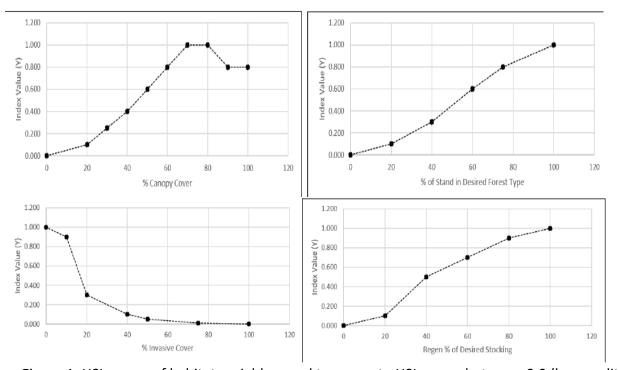


Figure 1. HSI curves of habitat variables used to compute HSI scores between 0.0 (low quality habitat) to 1.0 (high quality).

Structural Diversity is measured using five indicators which are scored on a scale of 0 to 1 and then averaged to find a single score for structural diversity, where 0 is the worst example of that indicator and 1 is the best example of that indicator. The five indicators include: horizontal structural diversity, vertical structural diversity, size class diversity, standing dead wood, and species diversity.

The floodplain forest model was run for FWOP and individually for each different measure. This is because each measure will have different benefits across the acres impacted and would thus have different HSI scores. The alternatives are evaluated based on the cumulative AAHUs across the measures included.

B. Yellow Warbler Model

This model was developed by the Habitat Evaluation Procedures Group in the Western Energy and Land Use Team of the U.S. Fish & Wildlife Service (Schroeder, 1982). It is a tool that can be

used to quantify benefits resulting from changes in the characteristics of yellow warbler breeding habitat. The model consists of three variables representing the characterization of shrub habitat including: percent deciduous shrub crown cover, average height of deciduous shrub canopy, and percent of deciduous shrub canopy comprised of hydrophytic shrubs. The model was designed to be applicable across the breeding range of the yellow warbler.

This model consists of Habitat Suitability Index curves for each of the three habitat variables: percent deciduous shrub crown cover, average height of deciduous shrub canopy, and percent of deciduous shrub canopy comprised of hydrophytic shrubs. These habitat variables will be influenced by the implementation of wetland/backswamp plantings. HSI curve equations are used in conjunction with existing habitat information to compute a total HSI score that ranges between 0.0 (poor suitability) to 1.0 (high suitability) (Figure 2).

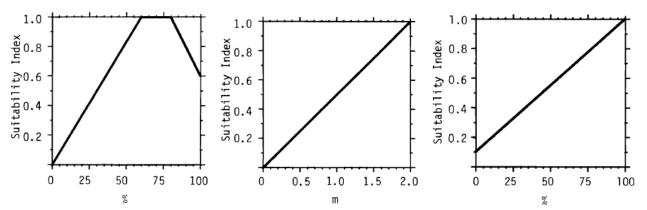


Figure 2. Yellow Warbler HSI model curves of habitat variables used to compute HSI scores between 0.0 (low suitability) to 1.0 (high suitability).

C. Quantitative Method

The quantitative method is often measured using area (acres of habitat, landform, etc.) or number of species; in some systems, it is measured as length (feet of stream bank). The area associated with a given proposed feature must have a clear definition for use as guidance in estimating the area component of the ecosystem output model and must be applied consistently to all actions evaluated. Habitat was evaluated in the location in which each measure would be placed.

For the Horse Island, a single approach was utilized to quantify the area of habitat benefits. The area of projected benefit was defined as polygons that were delineated based upon the desired management goals for their specific microhabitats, completed by the biologists and engineers within the USACE St. Louis District.

The quantitative component is the number of acres of the habitat being evaluated. From the calculated qualitative and quantitative values, the standard unit of measure, the habitat unit (HU) is calculated using the formula (HSI × Acres = HUs). Habitat units are generally calculated for specific target years to forecast changes in habitat values over the life of the project with- and without-project conditions. When HSI scores are not available for each year of analysis, a formula that requires only target year HSI and area estimates is used (USFWS, 1980).

This formula is:

$$\int_0^T HU \ dt = (T_2 - T_1) = \left[\left(\frac{A_1 H_1 + A_2 H_2}{3} \right) + \left(\frac{A_2 H_1 + A_1 H_2}{6} \right) \right]$$

Where:

 $\int_{0}^{T} HU \ dt = Cumulative \ HUs$

 T_1 = first target year of time interval T_2 = last target year of time interval

 A_1 = area of available habitat at beginning of time interval

 A_2 = area of available habitat at end of time interval

 H_1 = habitat suitability index at the beginning of time interval

 H_2 = habitat suitability index at the end of time interval

3 and 6= constants derived from integration of HSI × Area for the interval between any two target years

This formula was developed to precisely calculate cumulative HUs when either HSI, or area, or both change over a time interval, which is common when dealing with the unpredictable fluctuations found in nature. Habitat Unit gains or losses are then annualized by summing the cumulative HUs calculated using the above equation across all target years in the period of analysis and dividing the total (cumulative HUs) by the number of years in the life of the project (i.e., 50 years). This calculation results in the Average Annual Habitat Units (AAHUs) (USFWS, 1980). The calculation of the HUs and AAHUs were completed within Microsoft Excel. These are then entered into the overall equation to calculate the HSI for the target area.

The benefits of the proposed project measures (net AAHUs) are then determined by calculating the difference in AAHUs between the with-project benefits and the without-project benefits. The effects of various habitat improvement feature combinations (alternatives) can then be evaluated by comparing the net AAHUs and their associated costs for each alternative considered.

For the purpose of planning, design, and impact analysis, the period of analysis was established as 50 years. To facilitate comparison, target years were established at 0 (existing conditions), 3 (future without and future with project conditions), and 50 (future without and future with project conditions). Target years are used to analyze HUs and characterize habitat changes over the estimated period of analysis. HSIs for the evaluation species were calculated at the target years.

Corps guidance requires that the team evaluate a suite of features that can be combined in various ways to form project alternatives. The approach used to assess the benefits at Horse Island looked at benefits of project features and their combinations as alternatives and comparatively evaluated each alternative separately. This process is called the iterations process.

3. Assumption

In preparation of using the HSI models, the evaluation team conducted several site visits, reviewed aerial photography and considered existing forest information provided by USFWS site

managers. During the evaluation, assumptions were developed regarding existing conditions and projected with-project conditions relative to habitat changes over time and management practices.

A. Floodplain Forest

i. Existing Conditions:

The Horse Island study area is composed of approximately 1,200 acres floodplain forest and 400 acres of fallow agricultural fields. The floodplain forest is primarily Maple-Ash-Elm, scrub-shrub, and Willow forest community types, with some mixed forest in higher elevation areas that have a hard mast component. Overall, there has been a decline in forest community, species, and structural diversity in the study area over the past 100 years due to changes in hydrology, land-use, and invasive species. Invasive and aggressive species such as Japanese Hops and Bur Cucumber are present in canopy gaps, especially in the riverfront forest along the old channel. Much of the open, fallow fields have remained unforested for the past 30 years due to a high-density cover of weedy species that has prevented forest succession, though some lower elevation areas have started to transition into early-successional forest. Emerald Ash Borer, an invasive beetle from Asia, has significantly impacted the native green ash on the study site, causing an overall decline in that species. There is some ridge and swale topography across the study area, though the areas with a history of agriculture have been leveled for easier crop production. The willow and scrub-shrub forest communities are even aged with little to no understory of native species.

ii. Future Without Project:

Forest diversity and health are expected to decline over the next 50 years. Invasive species and aggressive species are expected to continue to spread throughout the study area, particularly in open canopy gaps, preventing natural recruitment of native species. Tree species diversity is expected to remain the same, especially in lower elevation areas where the understory is dominated by boxelder (Acre negundo), silver maple (*Acer sacchirinum*), and green ash (*Fraxinus pensylvannica*). EAB would continue to impact mature green ash, creating canopy gaps that could be overtaken by invasive and aggressive vining species. Additionally, the even-aged forest stands are expected to eventually mature and die, with little in the understory to replace the aging canopy. This will reduce canopy cover and structural diversity and could make these stands susceptible to invasive species. The fallow agricultural fields are expected to transition into a mix of shrubby, open field habitat, and even-aged, early successional forest.

iii. Future With Project

Project measures are expected to improve the overall forest health, diversity, and cover of the study area. Benefits would not be immediate as plantings will take time to grow and establish, but positive impacts will increase over the span of 50 years. Forest stand improvement (FSI) actions will support increased species diversity, improve structural diversity, and will support more diverse forest community types. Plantings including hard mast, backswamp, and species adapted to anticipated environmental changes will support overall resiliency and diversity of the floodplain forest. Stand improvement measures will support structural diversity by strategically opening the canopy for growth and recruitment of desirable species in the understory and underplanting in existing forest. Underplanting will also support overall species diversity. A phased approach to planting will create areas in different stages of development, creating structural diversity. Invasive

species treatment will include a variety of treatments for the reduction of invasive species throughout the study area. The soil disturbance cause by ridge and swale construction could increase the presence of invasive species in the short term, but site preparation and planting cover crops will reduce the spread. Long-term, the presence of invasive species will be greatly reduced compared to existing conditions. Tree Planting will increase in tree species diversity, particularly hard mast planted on higher elevation areas. There is an assumption that seasonal flooding and the existing topography is a leading factor in determining how the floodplain forest community has developed up to this point. Adding ridges will create additional high-elevation habitat that will support hard mast species, which are currently restricted to the existing high-elevation habitat. The existing and created elevations will inform the tree planting measure-trees will be planted based on assumptions of suitable elevations for different species. The measures will also support an increase in diversity of forest community types, including early-successional, Mixed, Oak-Pecan, and Backswamp and increased overall species diversity alongside the more desirable species composition. Ridge and swale planting would create vertical and horizontal diversity while canopy gap creation will increase horizontal diversity.

B. Wetland

i. Existing Conditions

Existing freshwater wetland consists of open water sloughs, with some emergent vegetation around the edges. These wetland areas retain no permanent connection to the Mississippi River. Some lower elevations within these wetlands retain shallow water after floodwaters recede. There is very little woody vegetation within the wetland depressions themselves but what is present is mainly tall swamp privet (*Forestiera acuminata*) and buttonbush (*Cephalanthus occidentalis*). Most of the existing shrub component in these slough areas is hydrophytic given the elevation and hydroperiod.

ii. Future Without Project

Initially, there would be no change from existing conditions because there would be no changes to shrub species composition or inundation patters in the short-term. Over time, tree mortality around the wetland areas would open up gaps in the canopy, allowing the shrub species to spread outward from the wetland areas. Some increased mortality of mature trees is expected as flooding regimes change and flooding becomes more frequent.

iii. Future With Project

All three of the yellow warbler model variables would be beneficially impacted by the proposed wetland plantings. Just after planting, the shrub crown cover and average shrub height are both likely to be similar to existing conditions. Over time, as the plantings become established, the percent of deciduous shrub crown cover will increase along the perimeter of the wetland areas. Likewise, the average shrub height will increase as the planted shrubs become established and grow over time. Immediately following planting, the percentage of hydrophytic shrubs will increase substantially, by design, through planting of specific species. Natural regeneration will maintain a high percentage of hydrophytic shrubs. As with the FWOP condition, some increased mortality of mature trees is expected as flooding regimes change and flooding becomes more frequent. However, these impacts will be attenuated by planting more hydrophytic vegetation and back swamp species that can thrive in these predicted conditions.

4. Results

Chapter 4 of the main report, *Plan Formulation*, describes each potential Project measure in detail. The Project planning team screened out several features and alternatives before this habitat quantification process began. Chapter 4 displays the proposed measures, screening criteria, and which measures were retained for inclusion in the project alternatives. The results of the habitat benefit evaluations are provided in Table 1.

Table 1. Net average and annual habitat benefits for the final array of alternatives at Horse Island NESP.

Alternative Name	Area (acres)	Total AAHU	Net AAHU
No Action	1928	564.5	0 259
Minimum 1	727	455.8	259.5
Minimum 2	193	120.5	90.8
Intermediate 1	648	434.3	250.1
Intermediate 2	930	581.9	350.4
Intermediate 3	1275	814.6	472.9
Maximum	1,928	1259.7	695.2

5. Bibliography

Fischenich, C., & Vogt, C. (2012). *The application of adaptive management to ecosystem resotration projects.* Vicksburg, MS: U.S. Army Corps of Engineers Ecological Management and Restoration Research Program.

Schroeder, R. L. (1982). *Habitat Suitability Index Models: Yellow Warbler*. Fort Collins, CO: USFWS. USACE. (2021). *Upper Mississippi River System Floodplain Forest Habitat Model*. St. Louis, MO: USACE.

Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)
Appendix D – Monitoring and Adaptive Management Plan

NESP Project Implementation Report with Integrated EA

1. Introduction

This appendix presents the feasibility level monitoring and adaptive management plan for the Horse Island study. This plan identifies and describes the monitoring and adaptive management activities proposed for the considered action alternatives and estimates associated cost and duration. This appendix outlines how the results of the monitoring would be used to adaptively manage each of the action alternatives, including monitoring targets which demonstrate success in meeting project objectives. The intent of this plan is to develop monitoring and adaptive management actions appropriate and to scale for the project's goal and objectives and areas of uncertainty. This plan will be further developed in the planning, engineering, and design (PED) phase as specific details are made available for the recommended plan.

A. Authority

The USACE prepared a Final Integrated Feasibility Report and Programmatic Environmental Impact Statement (PEIS) for the Upper Mississippi River – Illinois Waterways (UMR-IWW) System Navigation Feasibility Study (USACE, 2004) and recommended a dual-purpose authorization to address the navigation efficiency and ecosystem restoration of the UMR-IWW. The dual-purpose navigation and ecosystem sustainability program was authorized under Section 8004(b)(2) of the Water Resources Development Act of 2007, "The Secretary shall carry out, consistent with requirements to avoid adverse effects on navigation, ecosystem restoration projects to attain and maintain the sustainability of the ecosystem of the Upper Mississippi River and Illinois River in accordance with the general framework outlined in the Plan".

In accordance with Section 8004(h) of the Water Resources Development Act of 2007 the USACE, and interagency partners, identified ecosystem restoration projects based on their ability to address system restoration needs, represent a range of habitats, provide restoration actions throughout various parts of the system, and contribute to system learning (i.e., refine understanding of the most cost-effective restoration methods and best techniques to restore natural river process).

B. Framework

Section 1161 of WRDA 2016 requires that when conducting a feasibility study for ecosystem restoration, the proposed study includes a plan for monitoring the success of the ecosystem restoration. Additionally, paragraph (7)(d) of Section 1161 Implementation Guidance states that "an adaptive management plan will be developed for ecosystem restoration projects...appropriately scoped to the scale of the project." The implementation guidance for Section 1161, in the form of a CECW-P Memo dated 19 October 2017, also requires that an adaptive management plan be developed for all ecosystem restoration projects. Adaptive management "prescribes a process wherein management actions can be changed in response to monitored system response, so as to maximize restoration efficacy or achieve a desired ecological state" (Fischenich & Vogt, 2012). This adaptive management framework follows the two phased approached for set-up and implementation (Figure 1).

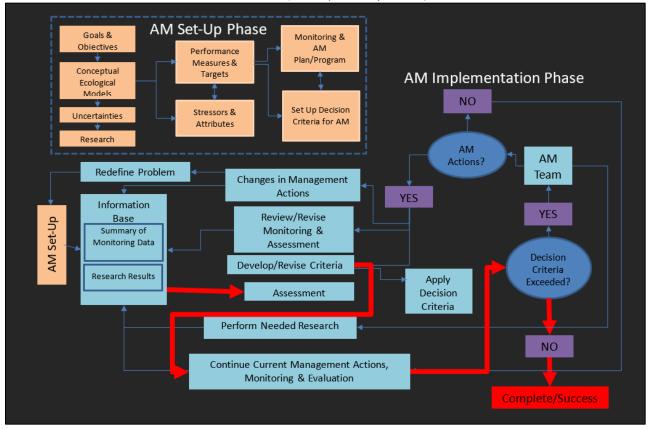


Figure 1. Adaptive Management Planning Flow Chart.

2. Adaptive Management Planning

The resulting adaptive management plan for NESP Horse Island describes and discusses whether adaptive management is needed in relation to the considered action alternatives identified in the project implementation report (PIR). The plan also identifies how adaptive management would be conducted and who would be responsible for specific adaptive management actions. The developed plan outlines how the results of study-specific monitoring would be used to adaptively manage the considered action alternatives, including specifications that will define success.

The Adaptive Management Plan reflects a level of detail consistent with the feasibility study. The primary intent was to develop monitoring and adaptive management actions appropriate for the study's restoration goal and objectives. The specified management actions permit estimation of the adaptive management plan costs and duration. The Adaptive Management Plan:

- identifies the restoration goal and objectives;
- presents a conceptual model that relates management actions to desired study outcomes;
 and
- lists sources of uncertainty that would lend themselves to adaptive management.

Following the discussion of the above, the subsequent sections of this appendix describe monitoring, assessment, and decision-making in support of adaptive management. The level of detail in this plan is based on currently available data and information developed during plan formulation as part of the Feasibility Study. Uncertainties remain concerning the exact restoration measures, monitoring elements and adaptive management opportunities. Components of the

monitoring and adaptive management plan, including costs, were similarly estimated using currently available information.

A. Goals and Objectives

The primary goal of the Horse Island project is to restore and improve the quality and diversity of floodplain forest ecosystem resources within the Project Area. Full realization of the potential habitat value in the Horse Island project area has been hindered by sedimentation issues, lack of natural hydrologic processes including hydrologic connection to the river, increased flooding, low topographical elevations, and land use changes. Additionally, the loss of topographic and hydrologic diversity reduces forest community diversity, degraded wetland habitat, and decreased wildlife resources on the islands.

The following restoration measures, also described in detail in the main report, were considered to achieve the Project goal and objectives:

- Tree planting of old field areas.
- Ridge and swale development with tree planting
- Wetland restoration
- Forest Stand Improvement with underplanting

B. Conceptual Ecological Model

Figure 2 shows the conceptual ecological model. This model identifies the drivers and stressors of the system and how they relate to four essential ecosystem characteristics. The team developed this model to aid in identifying the problems and potential management actions that could be implemented to counter the stressors that are degrading the floodplain forest.

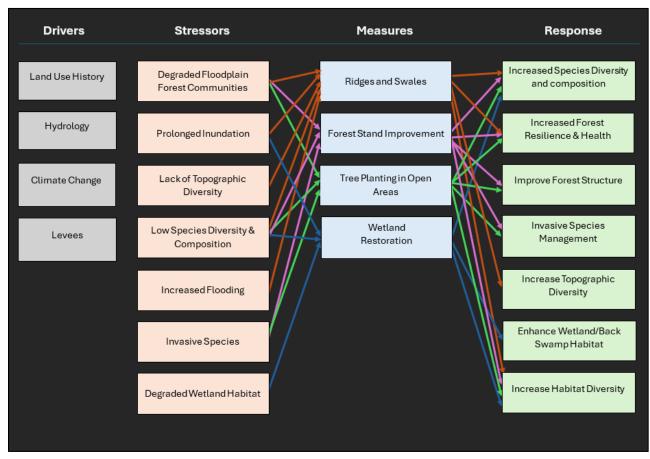


Figure 2. Conceptual Ecological Model for Horse Island HREP

C. Sources of Uncertainty

Adaptive management provides a process for making decisions in the face of uncertainty. The primary incentive for implementing an adaptive management plan is an increased likelihood of achieving desired project outcomes given the identified uncertainties, which can include incomplete description and understanding of relevant ecosystem structure and function; imprecise relationships among project management actions and corresponding outcomes; engineering challenges in implementing project alternatives; and ambiguous management and decision-making processes. Below is a list of uncertainties associated with the aquatic and terrestrial habitat in the Horse Island project.

- Future flood events
- Duration of inundation
- Resiliency of ridges to resist erosion
- Rate at which sediment is deposited on site
- Response of planted tree species to assigned elevations

- Response of backswamp species to existing wetland habitat
- Spread of invasive species following soil disturbance.

It is expected the implementation of the forest restoration and wetland restoration will increase the overall floodplain vegetative community health in the Project Area; however, there is some uncertainty as to whether the islands will become established with invasive vegetation, such as Japanese hops or reed canary grass following the TSI work, as canopy gaps are created and soil disturbances would result from ridge and swale construction. If monitoring demonstrates that invasive vegetation is becoming problematic for forest or wetland habitat, the invasive vegetation would be removed and then replanted with desired vegetation. Additionally, flood events may set back planting and maintenance or result in mortality of plantings. This could have an impact on project costs and schedule. While the targeted ridge height may be too low to completely keep the planted hard mast trees above the inundation level, the ridge heights were set to match elevations where the existing hardmast species currently do occur on site. There is also some uncertainty regarding how fast the swales would fill in with sediment.

3. Monitoring of Objectives to Determine Project Success and Adaptive Management Measures

The monitoring program is developed to support determinations of project success and inform adaptive management and is strengthened by the establishment of feedback between continued project monitoring and corresponding project management. All action alternatives are similar in terms of involving tree planting and varying amounts of ridge & swale construction. Therefore, the monitoring and adaptive management measures are similar. No MAM measures were identified for the structural component of the ridge and swale after construction, but the tree plantings over these features will have MAM measures. The success of tree plantings of various species at their targeted elevations on the ridge and swales will inform future ridge and swale design elevation. Performance indicators to the above objectives were developed with the best available knowledge. They were developed to be specific, measurable, attainable, realistic, and timely. Performance indicators, monitoring targets, and Adaptive Management measures are summarized in Table 1.

A. Restore Floodplain Forest Communities

• **Reforestation:** Monitoring will take place at years 2, 5, and 9 post-planting to determine success of planted trees. RPO Reforestation Monitoring protocol shall be used.

Success Criteria: Monitoring Target	Success Criteria: Management Measure Objective
Increased desired forest community acreage and 75% survivorship of planted trees through year 10 post-planting.	Provide healthy stands of forest community types based on topography with appropriate species planted depending on elevation and flood inundation.

NESP Project Implementation Report with Integrated EA Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)

Adaptive Management Measure: If monitoring results indicate an inability to reach success criteria by year 5 and less than 75% of ground cover is desirable plant species, then USACE will evaluate site conditions and adjust tree planting strategies accordingly.

• Forest Stand Improvement (FSI): This measure involves a variety of management actions including underplanting, reducing canopy cover by cutting and girdling trees, and treating invasive species. Monitoring will involve different criteria for the management action targeted on a stand-by-stand basis based on documented stand prescriptions developed by Rivers Project Office and the sponsor.

Success Criteria: Monitoring Target	Success Criteria: Management Measure Objective
Underplanting: Increased desired forest community acreage and 75% survivorship of planted trees through year 10 post-planting.	Provide healthy stands of forest community types based on topography with appropriate species planted depending on elevation and flood inundation.
Reduction of canopy cover: Increased natural regeneration of desired species by 20%.	Increase diversity of forest communities and promote regeneration of different age classes to improve forest structure.
Invasive species treatment: Reduction of invasive species cover by 75%	Improve health of forest communities and increase diversity of native vegetation.

Adaptive Management Measure: If monitoring results indicate an inability to reach success criteria by year 5, then USACE will evaluate site conditions and adjust tree planting strategies and increase invasive species removal accordingly.

B. Wetland Restoration

• **Wetland and Backswamp Restoration**: Wetland/Backswamp monitoring will take place at years 2, 5, and 9 post-planting to determine success of planted wet prairie species to determine ground cover (percent ground cover of planted species).

Success Criteria: Monitoring	Success Criteria: Management
Target	Measure Objective
75% survivorship of native plantings year 10 post-planting	Provide diverse wetland and backswamp habitat in areas that are too wet for healthy forest resources.

Adaptive Management Measure: If monitoring results indicate an inability to reach success criteria by year 5 and less than 70% of ground cover is desirable plant species, then USACE will evaluate site conditions and adjust tree planting strategies accordingly.

NESP Project Implementation Report with Integrated EA Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)

Table 1. Project objectives, performance indicators, monitoring target, and adaptive management triggers and measures.

Objective	Performance Indicator	Monitoring Target (Desired Outcome)	Responsible Party	Action Criteria (AM Trigger)	AM Measure
Restore floodplain forest communities	Tree Survivorship	Forest inventory surveys show increased desired forest community acreage and increased species diversity and a more desirable composition over baseline.	USACE	By year 5, forest community does not show 75% survivorship	Additional tree planting
Restore floodplain forest communities	Regeneration Rate	Forest inventory surveys show reduction of canopy cover and increased natural regeneration of desired species.	USACE	By year 5, forested areas do not show regen of desired species of 20%	Additional tree planting
Restore floodplain forest communities	Invasive Species Coverage	Forest inventory surveys show a reduction in invasive species coverage.	USACE	By year 5, Reduction of invasive species cover by 75%	Additional herbicide treatment
Restore and enhance the quality and diversity of wetland habitat	Tree Survivorship	Site inspections show an increase in backswamp tree species coverage surrounding wetland areas.	USACE	By year 5, 75% survivorship of native plantings	Additional tree planting

4. Documentation, Implementation Costs, Responsibilities, and Project Close-Out A. Documentation, Reporting, and Coordination.

The Project Delivery Team will document each of the performed assessments and communicate the results to the NESP program manager. Performance Evaluation Reports will be produced to measure progress towards the Project goal and objectives as characterized by the selected performance measures.

B. Cost.

The costs associated with implementing monitoring and adaptive management measures were estimated based on currently available data and information developed during plan formulation as part of the feasibility study. Because uncertainties remain as to the exact Project measures, monitoring elements, and adaptive management opportunities, the estimated costs in Table 2 will need refinement in PED during the development of the Detailed Monitoring and Adaptive Management Plans.

%/year	Year	Maximum	Inter 3	Inter 2	Inter 1	Min 2	Min 1
0.2	2	214,373.5	172,536.0	145,574.7	78,090.4	38,606.4	92,872.0
0.65	5	696,713.9	560,742.0	473,117.8	253,793.8	125,470.8	301,834.0
0.15	9	160,780.1	129,402.0	109,181.0	58,567.8	28,954.8	69,654.0
Total	-	1,071,867.5	862,680.0	727,873.5	390,452.0	193,032	464,360.0

Table 2. Costs for Adaptive Management and Monitoring.

C. Responsibilities.

The Corps will be responsible for collecting surveys, data analysis, site inspections, and visual observations to assist in overall project success evaluation.

D. Project Close-Out.

Close-out of the Project would occur when it is determined that the Project has successfully met the Project success criteria described above. Success would be considered to have been achieved when the Project objectives have been met, or when it is clear that they will be met based upon the trends for the site conditions and processes. Project success would be based on the following:

- Success criteria met,
- Continued site inspections to determine continued Project performance,
- and Continued OMRR&R into the future.

NESP Project Implementation Report with Integrated EA Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)

References

Fischenich, C., & Vogt, C. (2012). *The application of adaptive management to ecosystem resotration projects*. Vicksburg, MS: U.S. Army Corps of Engineers Ecological Management and Restoration Research Program.



ENVIRONMENTAL SITE ASSESSMENT REPORT: HORSE ISLANDS NAVIGATION ECOSYSTEM SUSTAINABILITY PROGRAM PROJECT IMPLEMENTATION

PREPARED FOR:

The U.S. Army Corps of Engineers St. Louis District 1222 Spruce Steet St. Louis, Missouri 63103

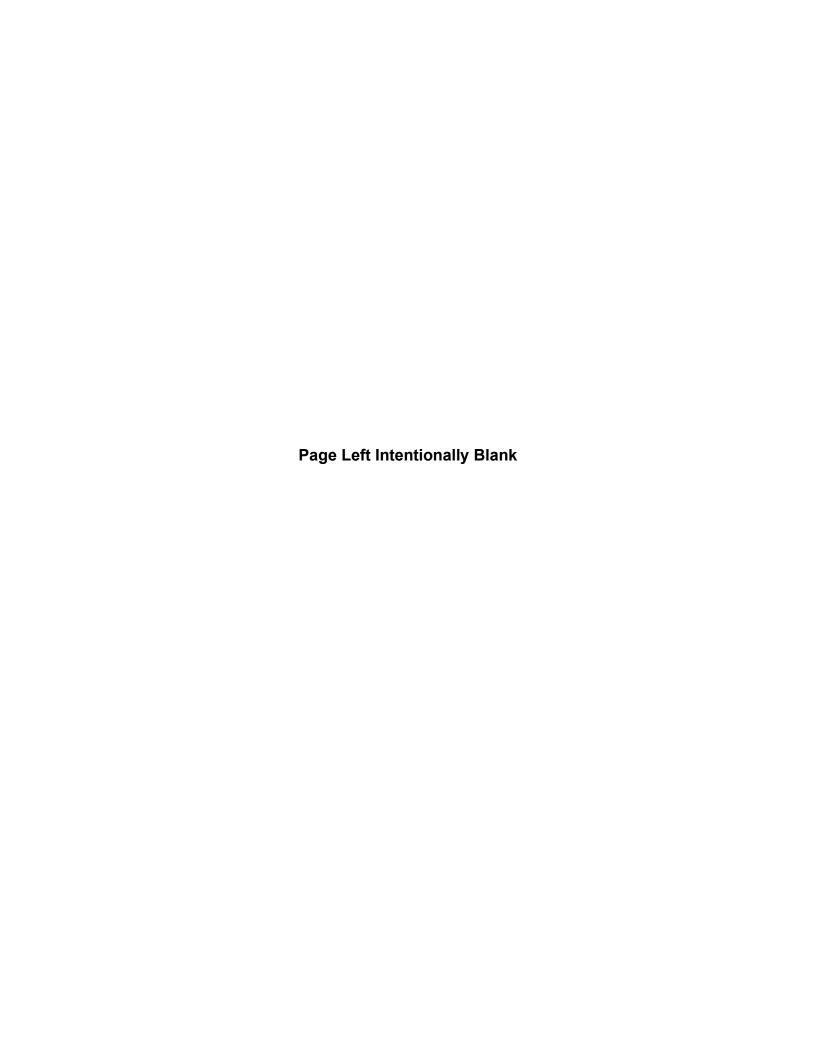


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1.0 ABBREVIATIONS

ABV	Description
ATSM	American Society for Testing and Materials
CEMVS-	U.S. Army Corps of Engineers, Environmental Quality and HTRW
EC-EQ	Section, Environmental and Munitions Branch
	Comprehensive Environmental Response, Compensation and Liability
CERCLA	Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
EDR	Environmental Data Resources
EMF	Electromotive force
EPA	Environmental Protection Agency
ER	Engineer Regulations
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
HTRW	Hazardous Toxic and Radioactive Waste
NESP	Navigation and Ecosystem Sustainability Program
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
PCB	Polychlorinated Biphenyl
REC	Recognized Environmental Condition
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture

2.0 ACKNOWLEDGEMENTS AND QUALIFICATIONS

Project Name:	Horse Island Navigation and Ecosystem Sustainability Program Project Implementation
Site Information:	Mississippi River Miles 111 – 113 Near Kaskaskia, Illinois
County:	Randolph County, Illinois
Latitude, Longitude	e: 37.875839°, -89.913077°
Site Assessor:	Kaleb Rakers Environmental Specialist
Environmental Pro	fessional Qualification:
	e best of my professional knowledge and belief, I meet the definition rofessional as defined in 40 CFR 312.10.
a property of the na and performed the	qualifications based on education, training, and experience to assess ature, history, and setting of the subject property. I have developed all appropriate inquiries in conformance with the standards and in 40 CFR Part 312.
Benjamin A Greelir Senior Reviewer	ng
	nmental Specialist

3.0 EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers regulations (ER-1165-2-132, ER 200-2-3) and Division policy requires procedures be established to facilitate early identification and appropriate consideration of potential Hazardous, Toxic, and Radioactive Waste (HTRW) in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting a Phase I Environmental Site Assessment (ESA). USACE specifies that these assessments follow the process/standard practices for conducting Phase I ESA's published by the American Society for Testing and Materials (ASTM).

The purpose of a Phase I ESA is to identify, to the extent feasible in the absence of sampling and analysis, the range of contaminants (i.e. Recognized Environmental Conditions, RECs) within the scope of the U.S. Environmental Protection Agency's (EPA) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. Current policy is to avoid known HTRW to the extent practicable or until hazard risks and potential liability are mitigated.

A Phase I ESA has been conducted for the Horse Island Navigation and Ecosystem Sustainability Program (NESP) project located in Randolph County, IL using methods outlined by ASTM E2247-16. This included a records review, physical site visit, and communications with persons knowledgeable of the project footprint and adjoining properties. Generally, the study area contains no major sites of interest which pose significant HTRW concerns. The environmental impact for the migration of off-site contaminants onto the project property is negligible. Therefore, no special considerations are being recommended for the project to proceed to construction. It is recommended that a Site Health and Safety Plan, and a Quality Control Plan are submitted by the awarded contractor, discussed internally by USACE personnel, and implemented to prevent environmental hazards from being developed during construction. The U.S. Army Corps of Engineers, Environmental Quality and HTRW Section, Environmental and Munitions Branch (CEMVS-EC-EQ) should be contacted immediately if future development of the property discovers hazardous or toxic materials.

4.0 INTRODUCTION

4.1 Background

The purpose of this Environmental Site Assessment (ESA) was to evaluate the current and historical conditions of the subject property to identify Recognized Environmental Conditions (RECs) in connection with the subject property and surrounding operations. Recognized Environmental Conditions are defined as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions.

4.2 Scope of Work

A Phase I ESA was conducted at the subject property in accordance with ASTM Standards Practice E2247-16, and further defined below:

- USACE has engaged with individuals having institutional knowledge of the subject properties to discuss environmental conditions. Documented conversations and questionnaires are available in Supplementary Materials A.
- USACE has physically inspected the subject property via walking survey, looking for signs of recognized environmental conditions such as stressed vegetation, soil staining, dumping, and evidence of aboveground and underground storage tanks. Photo documentation for the site visit is available in Supplementary Materials B.
- USACE has gathered and reviewed available Federal, State, and tribal
 environmental records. Standard environmental records reviewed included
 Federal NPL; Federal and State CERCLIS; Federal and State institutional
 controls/engineering controls registries; Federal ERNS list; State and tribal
 landfill and/or disposal site lists; State and tribal leaking storage tank lists;
 State and tribal registered storage tank lists; State and tribal voluntary
 cleanup sites; and State Brownfield sites. Details from the standard
 environmental records review are available in Supplementary Materials C.
- USACE has physically observed adjoining properties, paying particular attention to evidence of aboveground and underground storage tanks, questionable housekeeping practices, or unusual business practices.

4.3 Limitations

The observations, measurements, and research reported herein are considered sufficient in detail and scope to form a reasonable basis for a Phase I ESA of the subject property (ASTM E2247-16). The assessment, conclusions, and recommendations presented herein are based upon the subjective evaluation of limited data. The data may not represent all conditions at the subject site, as they reflect the

information gathered from specific locations. The limitations of this assessment should be recognized as the client formulates conclusions on the environmental risks associated with these properties.



5.0 GENERAL PROJECT AND SITE INFORMATION

Figure 1: General Study Area

5.1 Project Description

The Middle Mississippi River National Wildlife Refuge is located on the Mississippi River downstream from St. Louis, Missouri. The Horse Island Division is near Kaskaskia. Illinois (RM 111-113). This Phase 1 covers a portion of the Horse Island Division, the project area is shown in Figure 1.

5.2 Physical Site Description

While it lies west of the Mississippi River, Horse Island is within Illinois rather than Missouri; the state boundary was drawn when the main river channel flowed to the west of the study area. Lands in the study area are within the Refuge boundary and are owned by the United States Fish and Wildlife Service (USFWS). The study area comprises a total of 2,000 acres and consists of point bar (floodplain forest, riverfront forest, shrub swamp, and old field habitats) and backswamp (willow, shrub swamp and open water habitats) geomorphic surfaces on the riverside of the levees.

5.3 Historical and Current Land Use

Historical aerials dating back to 1940 show the land use has been similar throughout this site's history with a mix between agricultural fields, forested areas, and swamp/marsh areas. Current land use is approximately 20% non-forested abandoned agricultural fields, and 80% riverfront forest communities. In a questionnaire USFWS staff indicated that it is likely that herbicides and pesticides were applied to the study area especially in areas where agriculture use was prominent. The Natural Resources Conservation Service (NRCS) applied herbicides in the study area when preparing a site for a 400-acre tree planting in 2005. It is unlikely these instances of herbicide use have largely affected the study area since there were no signs of stressed vegetation, and the study area has been flooded multiple times since 2005.

5.3 Adjoining Property Use

Directly adjoining property use is similar to the study area with some agriculture fields, forested areas, and swamp/wetland areas being the most prevalent form of land use. The old river channel and the Kaskaskia levee border the study area. The old river channel separates the study area from the town of St. Mary, Missouri. The Kaskaskia levee separates the study area from large agriculture fields and some properties with agriculture buildings such as barns and silos.

6 PHASE I ENVIRONMENTAL SITE ASSESSMENT DUE DILIGENCE

6.3 Interview(s) with Past and Present Owners, Operators, and Occupants A questionnaire was sent to Jared Nance who has served as the refuge manager since 2021 and has worked on the refuge for USFWS since 2018. The content of the questions asked followed the format of ASTM E2247-16. Relevant information discovered during the interview is summarized in Supplementary Materials A.

6.4 Interview(s) with State and/or Local Government Officials
The Randolph County Emergency Management Agency was contacted on January
22nd, 2024. No response was received, this is considered a data gap according to the
ASTM E2247-16 standard.

6.5 Site Reconnaissance

On October 12, 2023, Environmental Specialist Kaleb Rakers of CEMVS-EC-EQ and other members of the study team performed a site visit for the Horse Island NESP project. This site visit was guided by USFWS personnel who are knowledgeable about the refuge. All accessible areas of the project were observed during this site visit. Photo documentation for the site visit can be reviewed in the table of referenced figures (pg. 14).

6.6 Records Review

Table 1 provides a full list of records reviewed by the Environmental Professional for this assessment. These records assist in meeting the requirements of the EPA's Standards and Practices for All Appropriate Inquiry (AAI; 40 CFR Part 312), and the

ASTM Standard Practice for Environmental Site Assessments (ASTM E1527-13). In addition, the physical setting was assessed for the study area by reviewing topographic maps to identify conditions in which hazardous substances or petroleum products could migrate. Additional details can be reviewed in Supplemental Materials B.

Table 1: Government Records Reviewed

Standard Environmental Record Resources Provided by EDR Lightbox	Search Distance miles (kilometers)
Federal NPL (Superfund) sites	1.0 (1.6)
Federal Delisted NPL sites	0.5 (0.8)
Federal sites subject to CERCLA removals and CERCLA orders	0.5 (0.8)
Federal CERCLA sites with NFRAP	0.5 (0.8)
Federal RCRA facilities undergoing Corrective Action	1.0 (1.6)
Federal RCRA TSD facilities	0.5 (0.8)
Federal RCRA generators	Target property and adjoining properties
Federal institutional control/engineering control registries	Target Property Only
Federal ERNS list	Target Property Only
State and tribal "Superfund" equivalent sites	1.0 (1.6)
State and tribal hazardous waste facilities	0.5 (0.8)
State and tribal landfills and solid waste disposal facilities	0.5 (0.8)
State and tribal leaking storage tanks	0.5 (0.8)
State and tribal registered storage tanks	Target property and adjoining properties
State and tribal institutional control/engineering control registries	Target Property Only
State and tribal voluntary cleanup sites	0.5 (0.8)
State and tribal brownfield sites	0.5(0.8)

7 SUMMARY OF FINDINGS AND RECOMMENDATIONS

A records review, site reconnaissance, and interviews with knowledgeable persons identified no RECs near or within the project footprint. Generally, the study area contains no major sites of interest, which pose significant environmental concerns. The environmental impact for the migration of off-site contaminants onto the project property is negligible. Therefore, a Phase II Environmental Site Assessment is not recommended. A Site Health and Safety Plan, and a Quality Control Plan should be required, discussed, and implemented to prevent environmental hazards from being developed during construction. CEMVS-EC-EQ should be contacted immediately if future development of the property indicates the presence of hazardous or toxic materials.

8 OPINION OF THE ENVIRONMENTAL PROFESIONAL

Based on the data and resources available for this assessment, it is the Environmental Professional's opinion that the study area contains no major sites of interest that would impact the project's design, cost, or schedule. The environmental impact for the migration of off-site contaminants onto the study area is negligible, a Phase II ESA is currently not recommended.

The CEMVS-EC-EQ should be contacted with any known or suspected variations from the conditions described herein. If future development of the properties indicates the presence of hazardous or toxic materials, CEMVS-EC-EQ should be notified.

9 DATA GAPS

The only data gap for this Phase I was that no interview was conducted with Emergency Management officials. There was an attempt to conduct this interview but, personnel at the Randolph County Emergency Management Agency never responded.

10 LIMITATIONS AND EXCEPTIONS

U.S. Army Corps of Engineers, Environmental Quality and HTRW Section, Environmental and Munitions Branch (CEMVS-EC-EQ) should be contacted with any known or suspected variations from the conditions described herein. If future development of the property indicates the presence of hazardous or toxic materials, USACE should be notified to perform a re-evaluation of the environmental conditions.

The scope of this assessment did not include any additional environmental investigation, not outlined herein, or analyses for the presence or absence of hazardous or toxic materials in the soil, ground water, surface water, or air, in, on, under, or above the subject tract.

This site assessment was performed in accordance with generally accepted practices of consultants undertaking similar studies at the same time and in the same geographical area, and USACE observed the degree of care and skill generally exercised by consultants under similar circumstances and conditions. The findings and conclusions stated herein must be considered not as scientific certainties, but rather as professional opinions concerning the significance of the limited data gathered during the course of the environmental site assessment. No other warranty, expressed or implied, is made.

Specifically, USACE does not and cannot represent that the site contains no hazardous waste or material, oil (including petroleum products), or other latent condition beyond that observed by USACE during its site assessment.

The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedure beyond the scope of described services or the time and budgetary constraints imposed by the client. Furthermore, such conclusions are based solely on site conditions and rules and regulations, which were in effect at the time of the study.

In preparing this report, USACE relied on certain information provided by State and local officials and other parties referenced herein, and on information contained in the files of State and/or local agencies available to USACE at the time of the site assessment. Although there may have been some degree of overlap in the information provided by these various sources, an attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site assessment was not made.

Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the site or to structures on the site was unavailable or limited, USACE renders no opinion as to the presence of indirect evidence relating to hazardous waste, material, oil, or other petroleum products in that portion of the site or structure. In addition, USACE renders no opinion as to the presence of hazardous waste or material, oil, or other petroleum products or to the presence of indirect evidence relating to hazardous material, oil, or petroleum products where direct observation of the interior walls, floor, roof, or ceiling of a structure on a site was obstructed by objects or coverings on or over these surfaces.

Unless otherwise specified in the report, USACE did not perform testing or analyses to determine the presence or concentration of asbestos, radon, formaldehyde, lead-based paint, lead in drinking water, electromagnetic fields (EMFs), or polychlorinated biphenyls (PCBs) at the site or in the environment at the site.

The purpose of this report is to assess the physical characteristics of the subject site with respect to the presence of hazardous waste, material, oil, or petroleum products in the environment. Except as otherwise described in this report, no specific attempt was made to check on the compliance of present or past owners or operators of the site with Federal, State, or local laws and regulations, environmental or otherwise.

Personnel from CEMVS-EC-EQ have specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property and declare that, to the best of their professional knowledge and belief, meet the definitions of Environmental Professionals as defined under 40 CFR 312.

11 REFERENCES

ASTM, 2021. 1527-21 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

ASTM, 2021. E2247-16 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property.

USACE, 1992. ER 1165-2-132 Hazardous Toxic and Radioactive Waste Guidance for Civil Works Projects, Washington DC: Department of the Army.

USACE, 2022. ER 200-2-3 *Environmental Compliance Policies*, Washington D. C.: Department of the Army.

USEPA, 2005. 40 CFR 312: Innocent Landowners, Standards for Conducting All Appropriate Inquiries. *Code of Federal Regulations*.

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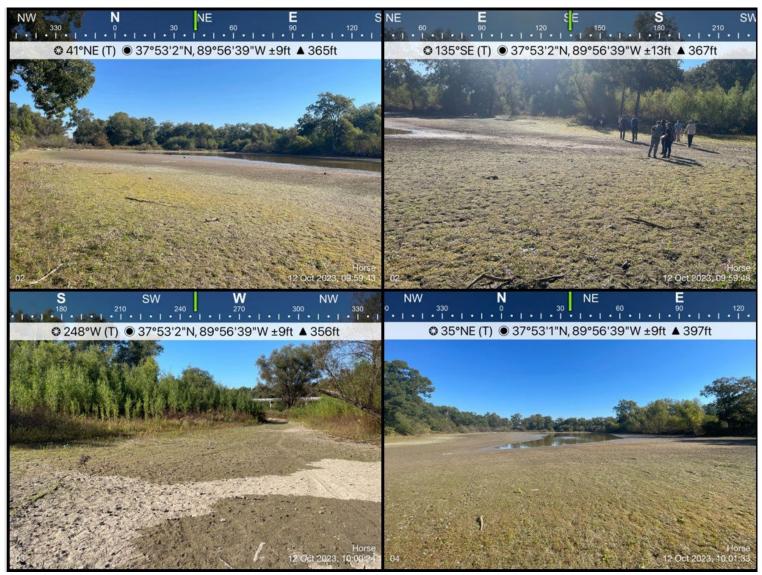


Figure 2: Eastern and Southern end of the freshwater pond near Old Channel Road.



Figure 3: Debris found on the western end of the freshwater pond and forested area southwest of the freshwater pond.



Figure 4: Forested area near the center of the study area.

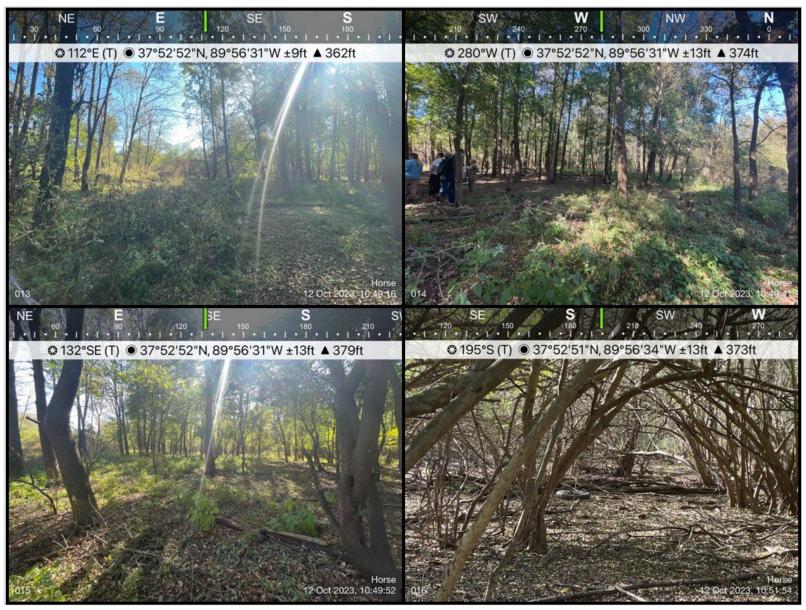


Figure 5: Forested area in the southwestern study area, various debris had washed into this area during floods.



Figure 6: Forested area in the northwest of Old Channel Road.



Figure 7: Forested area in the northwestern portion of the study area with various debris that had been washed in.



Figure 8: Forested area near the old river channel in the northwestern section of the study area.



Figure 9: Old agricultural field in the eastern part of the study area.

SUPPLEMENTARY MATERIALS A: INTERVIEW QUESTIONNAIRE

Name: Jared Nance Position/Role on Property: Refuge Manager

- 1. How long has the current owner owned this property? USFWS acquired the property in 2006.
- 2. Has there ever been any herbicide or pesticide application to the property? Unknown, but most likely. A large portion of the property was in agriculture prior to being in USFWS ownership. Also, NRCS attempted an approximate 400-acre tree planting in 2005 where some herbicides were most likely used for site preparation.

If so, what chemicals were applied? Unknown

How many years were they applied? Unknown

3. Has there ever been any type of spill (oil products, chemicals, etc.) on the property?

None known.

If so, what was spilled an approximately how many gallons? N/A

Did spill reach surface waters? N/A

- 4. Was the property ever used for an industrial use? If so, what type? None known.
- Were the properties ever used as a dump site (metal, tires, glass, chemical containers, old drums, etc.), either household or industrial?

 The property is frequently flooded from the Mississippi River and trash does float in. There is assorted manmade trash located throughout the property, but no known hazardous material is located on the property. There was also a tornado in October 2021 that passed through the property that left debris from the nearby town of St. Mary, MO.
- 6. Were there or are there any storage tanks either underground or aboveground? If so, how many gallons, what did they store, gasoline, fuel oil, etc.? There are no known storage tanks located on the property.

Did they leak and were they removed? N/A

- 7. Are there any wells (drinking or other) on this property? There are no known wells located on the property.
- 8. Were there or are there any wastewater treatment or sewage disposal facilities (septic systems, lagoons, etc.) on this property?

 There are no known wastewater treatment or sewage disposal facilities on the property.
- 9. Were there or are there any transformers, capacitors or hydraulic equipment which could have contained PCB's?

 There are no known PCBs or possible PCB causing agents on the property.
- Any storage of hazardous materials? If so, how much, when, for how many years? Where on property?

 There are no known storage of any hazardous materials on the property.
- 11. Any burn pits on this property?

 There are no known burn pits on the property.
- 12. Any buildings on this property?
 No

Were they built before 1980? N/A

13. Has an asbestos and lead based paint survey been completed for the buildings?

If so, was any asbestos and/or lead based paint found? N/A

Was it removed?

N/A

14. Is the property served by a public or private drinking water supply?
No

Is this supply conveyed through asbestos cement mains, lead containing lines or piping that uses copper and/or lead solder?

N/A

15. Are there pipelines on or near this property? If so, where are they located? What are they transporting?
No

16.	Does the property require a National Pollutant Discharge Elimination System? so, what is the NPDES number? Have there been any violations?	If

SUPPLEMENTARY MATERIALS B: RECORDS REVIEW

Horse Island

Horse Island Saint Mary, IL 63673

Inquiry Number: 7523582.5s

December 19, 2023

EDR Area / Corridor Report



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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

SUBJECT PROPERTY INFORMATION

ADDRESS

HORSE ISLAND SAINT MARY, IL 63673

TARGET PROPERTY SEARCH RESULTS

The Target Property was identified in the following databases.

Page Numbers and Map Identifications refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in **bold italics** are in multiple databases.

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Page Numbers and Map Identifications refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in **bold italics** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of state and tribal leaking storage tanks

MO LUST: Leaking Underground Storage Tanks

A review of the MO LUST list, as provided by EDR, and dated 08/28/2023 has revealed that there is 1 MO LUST site within approximately 0.5 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BARNETT'S 66	HWY 61	SSW 0 - 1/8 (0.125 mi.)	A2/7	36
Facility Id: ST0006270				

Date Of NFA Letter From DNR: 2013-04-09 00:00:00

EXECUTIVE SUMMARY

Lists of state and tribal registered storage tanks

MO UST: Petroleum Storage Tanks

A review of the MO UST list, as provided by EDR, and dated 08/28/2023 has revealed that there is 1 MO UST site within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BARNETT'S 66	HWY 61	SSW 0 - 1/8 (0.125 mi.)	A2/7	36

Facility Id: ST0006270 Tank Status: Removed

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/04/2023 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the requested target property.

Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
RITTER PAINTING COMP	132 3RD ST	SW 1/8 - 1/4 (0.142 mi.)	3/7	43
EPA ID: MO0000887331				

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR Exclusive Historical Auto Stations

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there is 1 EDR Hist Auto site within approximately 0.125 miles of the requested target property.

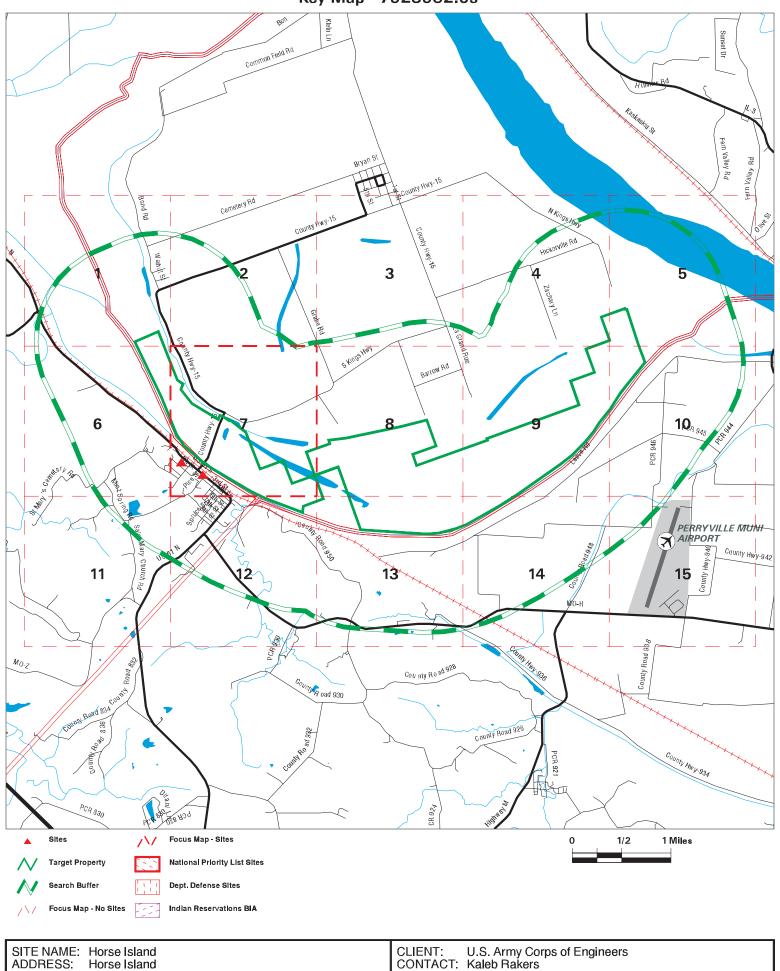
Site	Address	Direction / Distance	Map ID / Focus Map(s)	Page
BARNETTS SIXTY SIX	650 2ND ST	SW 0 - 1/8 (0.109 mi.)	A1 / 7	36

MAPPED SITES SUMMARY

Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS		(ft. & m	,
A1 / 7	BARNETTS SIXTY SIX	650 2ND ST	EDR Hist Auto	573	0.109	SW
A2 / 7	BARNETT'S 66	HWY 61	MO LUST, MO UST	658	0.125	SSW
3/7	RITTER PAINTING COMP	132 3RD ST	RCRA NonGen / NLR, FINDS, ECHO	748	0.142	SW

Key Map - 7523582.5s



SITE NAME: Horse Island ADDRESS: Horse Island CITY/STATE: Saint Mary IL ZIP: 63673

Kaleb Rakers INQUIRY #: 7523582.5s DATE: 12/19/23

9:17 AM

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	Total Plotted
STANDARD ENVIRONMEN	TAL RECORDS	<u>s</u>						
Lists of Federal NPL (Sup	perfund) site:	s						
NPL Proposed NPL NPL LIENS	1.000 1.000 1.000		0 0 0	0 0 0	0 0 0	0 0 0	NR NR NR	0 0 0
Lists of Federal Delisted	NPL sites							
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites sub CERCLA removals and C		rs						
FEDERAL FACILITY SEMS	0.500 0.500		0 0	0 0	0 0	NR NR	NR NR	0 0
Lists of Federal CERCLA	sites with N	FRAP						
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA faundergoing Corrective A								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TS	SD facilities							
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA ge	enerators							
RCRA-LQG RCRA-SQG RCRA-VSQG	0.250 0.250 0.250		0 0 0	0 0 0	NR NR NR	NR NR NR	NR NR NR	0 0 0
Federal institutional cont engineering controls reg								
LUCIS US ENG CONTROLS US INST CONTROLS	0.500 0.500 0.500		0 0 0	0 0 0	0 0 0	NR NR NR	NR NR NR	0 0 0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
Lists of state- and tribal hazardous waste facilitie	s							
IL SSU	1.000		0	0	0	0	NR	0
Lists of state and tribal la and solid waste disposal								
IL SWF/LF IL CCDD IL LF SPECIAL WASTE IL NIPC	0.500 0.500 0.500 0.500		0 0 0 0	0 0 0 0	0 0 0 0	NR NR NR NR	NR NR NR NR	0 0 0 0

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted	
Lists of state and tribal leaking storage tanks									
IL LUST MO LUST INDIAN LUST IL LUST TRUST	0.500 0.500 0.500 0.500		0 1 0 0	0 0 0 0	0 0 0	NR NR NR NR	NR NR NR NR	0 1 0 0	
Lists of state and tribal I	registered sto	rage tanks							
FEMA UST IL UST MO UST IL AST INDIAN UST	0.250 0.250 0.250 0.250 0.250		0 0 1 0	0 0 0 0	NR NR NR NR NR	NR NR NR NR NR	NR NR NR NR NR	0 0 1 0 0	
State and tribal institution control / engineering control /		es							
IL ENG CONTROLS IL INST CONTROL	0.500 0.500		0	0 0	0 0	NR NR	NR NR	0 0	
Lists of state and tribal	voluntary clea	anup sites							
IL SRP INDIAN VCP	0.500 0.500		0 0	0 0	0 0	NR NR	NR NR	0 0	
Lists of state and tribal l	brownfield sit	es							
IL BROWNFIELDS	0.500		0	0	0	NR	NR	0	
ADDITIONAL ENVIRONME	NTAL RECOR	<u>os</u>							
Local Brownfield lists									
US BROWNFIELDS	0.500		0	0	0	NR	NR	0	
Local Lists of Landfill / S Waste Disposal Sites	Solid								
INDIAN ODI DEBRIS REGION 9 ODI IHS OPEN DUMPS	0.500 0.500 0.500 0.500		0 0 0 0	0 0 0 0	0 0 0	NR NR NR NR	NR NR NR NR	0 0 0 0	
Local Lists of Hazardous Contaminated Sites	s waste /								
US HIST CDL IL CDL US CDL	TP TP TP		NR NR NR	NR NR NR	NR NR NR	NR NR NR	NR NR NR	0 0 0	
Local Land Records									
LIENS 2	TP		NR	NR	NR	NR	NR	0	
Records of Emergency I	-	rts							
HMIRS IL SPILLS	TP TP		NR NR	NR NR	NR NR	NR NR	NR NR	0 0	

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	<u>1/2 - 1</u>	<u>> 1</u>	Total Plotted
IL SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	1	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR EPA WATCH LIST	TP TP		NR NR	NR NR	NR NR	NR NR	NR NR	0 0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	Ö
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS ICIS	TP TP		NR NR	NR NR	NR NR	NR NR	NR NR	0 0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT INDIAN RESERV	1.000 1.000		0 0	0 0	0 0	0 0	NR NR	0 0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	Ö	Ö	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
MINES MRDS	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR NB	0
UXO ECHO	1.000 TP		0 NR	0 NR	0 NR	0 NR	NR NR	0 0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		Ō	Ō	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR NB	NR NR	NR NR	0
PFAS WQP PFAS NPDES	0.250 0.250		0 0	0 0	NR NR	NR NR	NR NR	0 0
PFAS NPDES PFAS ECHO	0.250		0	0	NR	NR	NR	0
PFAS ECHO FIRE TRAINI			0	0	NR	NR	NR	0
· · · · · · · · · · · · · · · ·			-	-	·			-

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PFAS PART 139 AIRPORT AQUEOUS FOAM NRC BIOSOLIDS IL PFAS IL AIRS IL ASBESTOS IL BOL IL COAL ASH IL DRYCLEANERS IL Financial Assurance	0.250 0.250 TP 0.250 TP TP TP 0.500 0.250		0 0 NR 0 NR NR NR 0 0	0 0 NR 0 NR NR NR 0 0	NR NR NR NR NR NR NR NR NR	NR NR NR NR NR NR NR NR	NR NR NR NR NR NR NR NR	0 0 0 0 0 0 0
IL HWAR IL IMPDMENT IL NPDES IL PIMW IL TIER 2 IL UIC EDR HIGH RISK HISTORICA	TP 0.500 TP 0.250 TP TP		NR 0 NR 0 NR NR	NR 0 NR 0 NR NR	NR 0 NR NR NR NR	NR NR NR NR NR	NR NR NR NR NR	0 0 0 0 0
EDR Exclusive Records EDR MGP EDR Hist Auto EDR Hist Cleaner EDR RECOVERED GOVERN	1.000 0.125 0.125 MENT ARCHI	VES	0 1 0	0 NR NR	0 NR NR	0 NR NR	NR NR NR	0 1 0
Exclusive Recovered Gov IL RGA HWS IL RGA LF IL RGA LUST	t. Archives TP TP TP		NR NR NR	NR NR NR	NR NR NR	NR NR NR	NR NR NR	0 0 0
- Totals		0	3	1	0	0	0	4

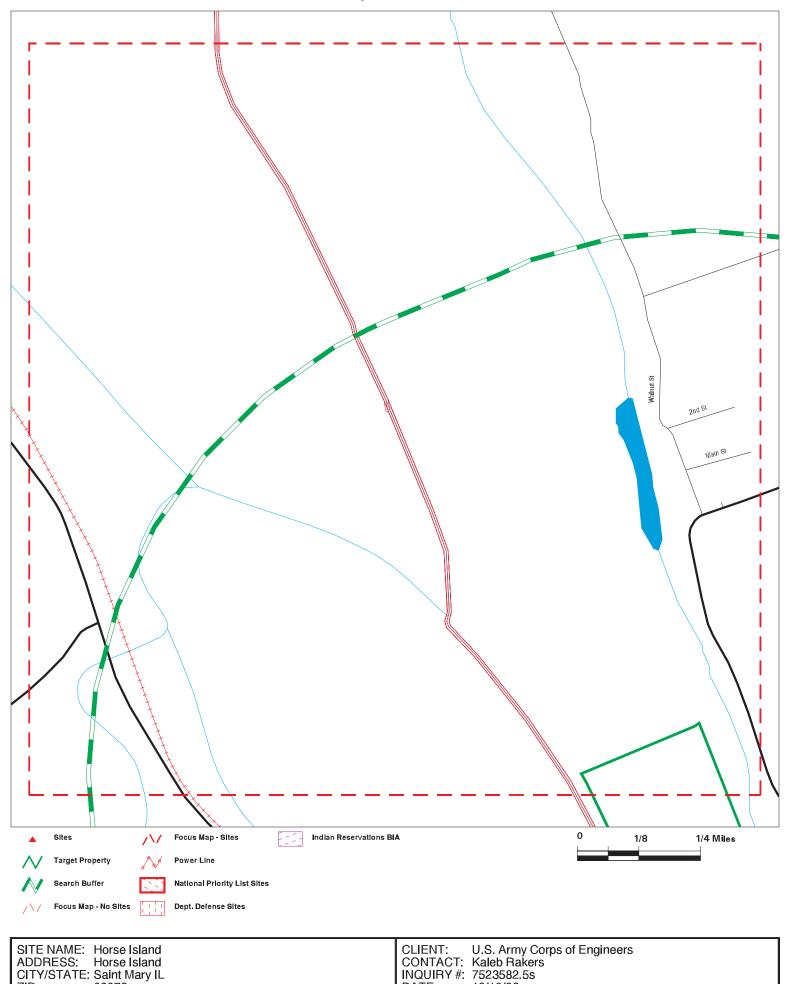
NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Focus Map - 1 - 7523582.5s



ZIP:

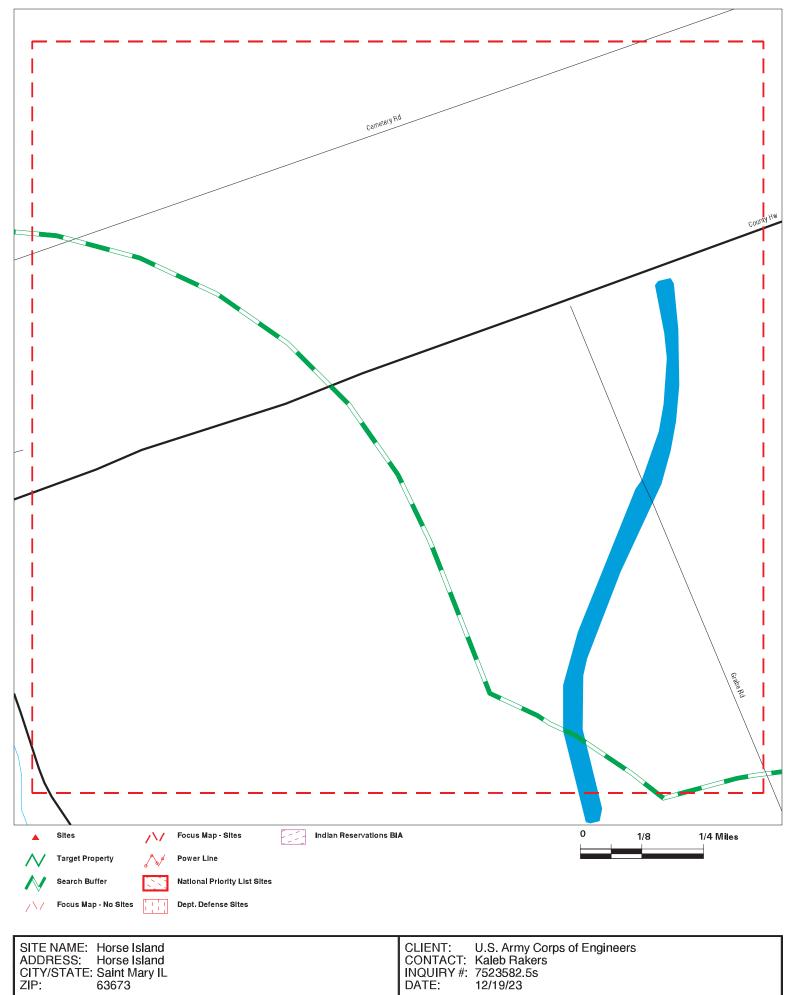
63673

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DATE:

Target Property: HORSE ISLAND SAINT MARY, IL 63673

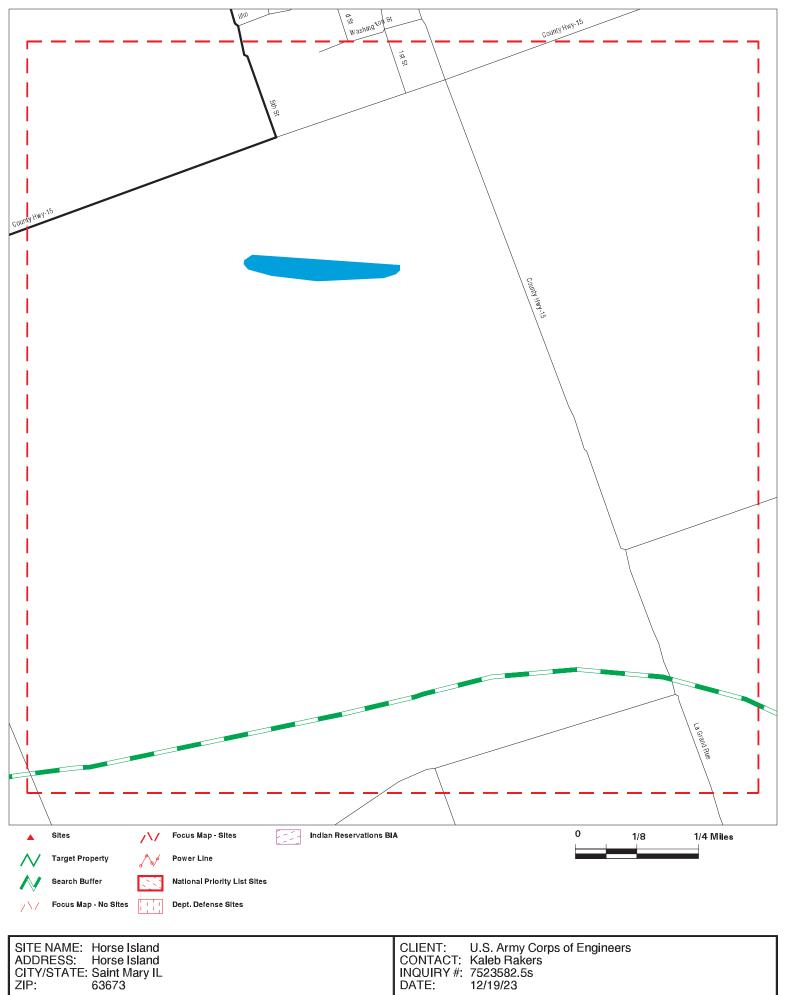
MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION



Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

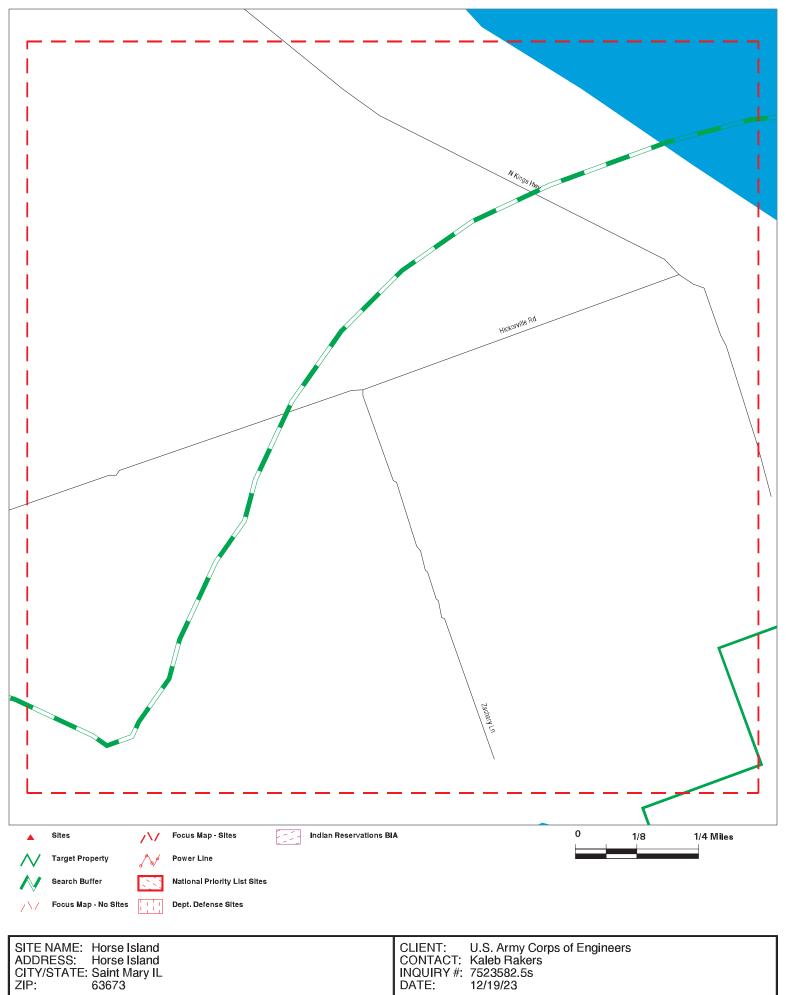
Focus Map - 3 - 7523582.5s



Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

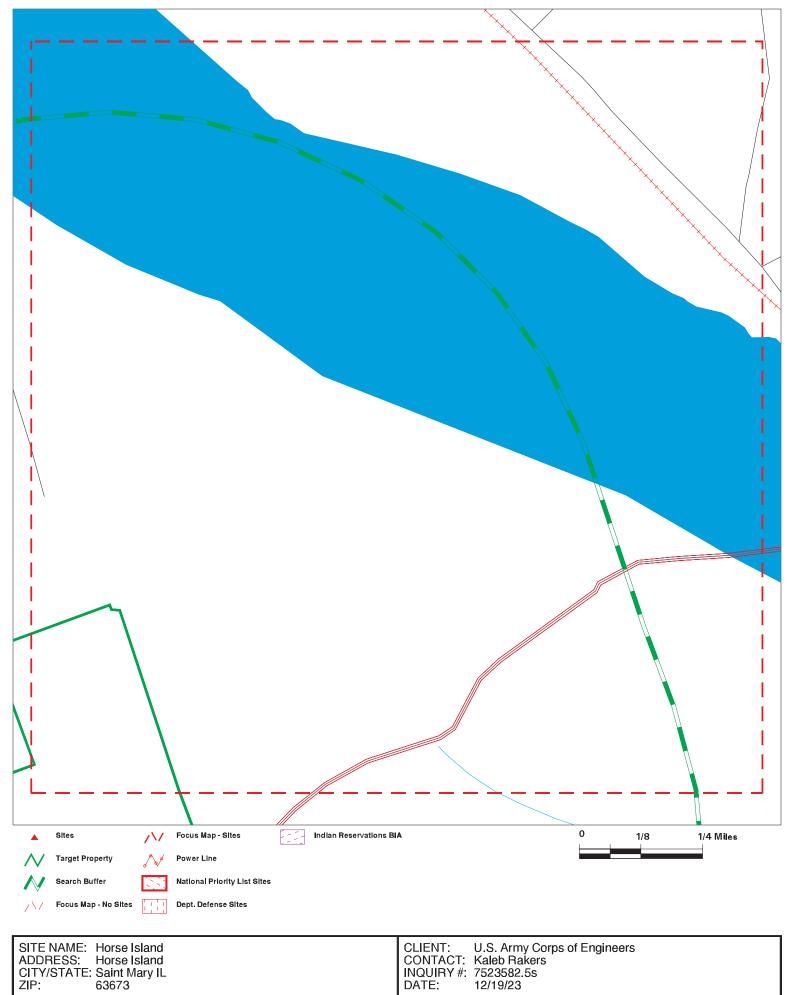
Focus Map - 4 - 7523582.5s



Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

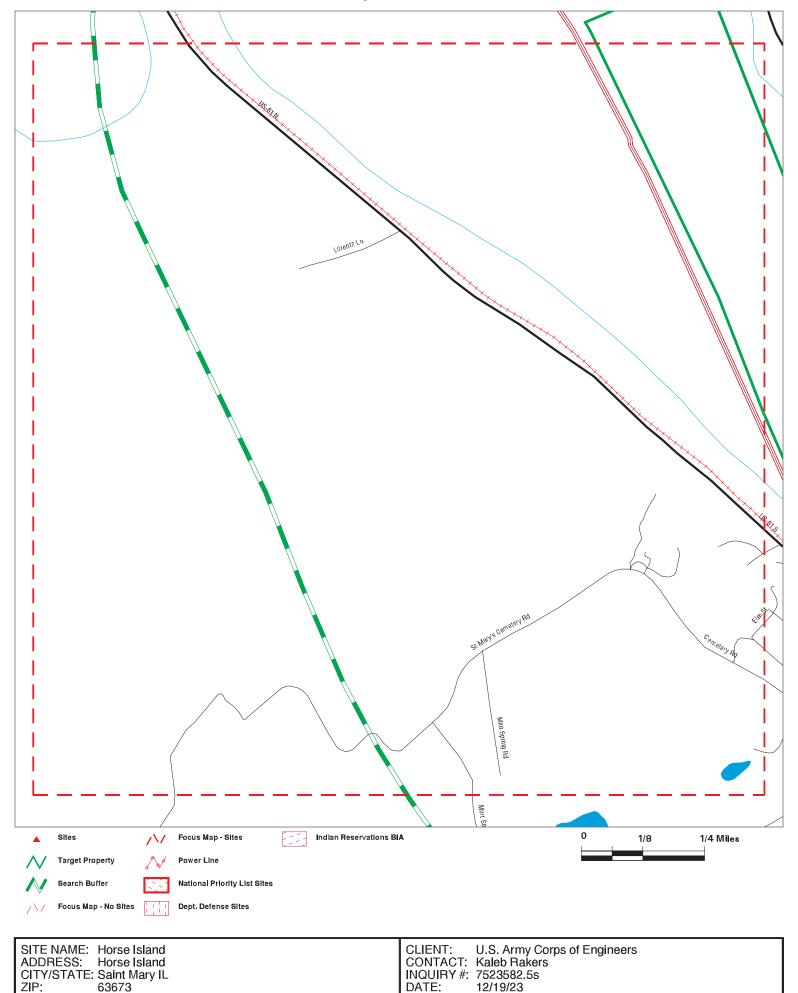
Focus Map - 5 - 7523582.5s



Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

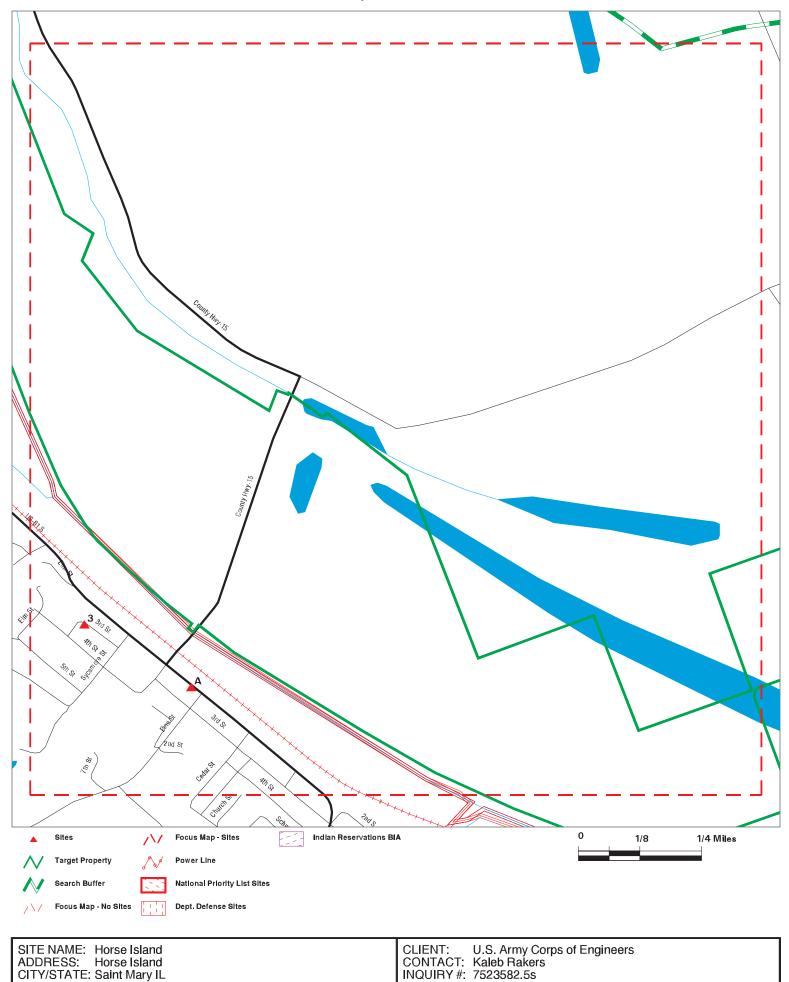
Focus Map - 6 - 7523582.5s



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Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION



ZIP:

63673

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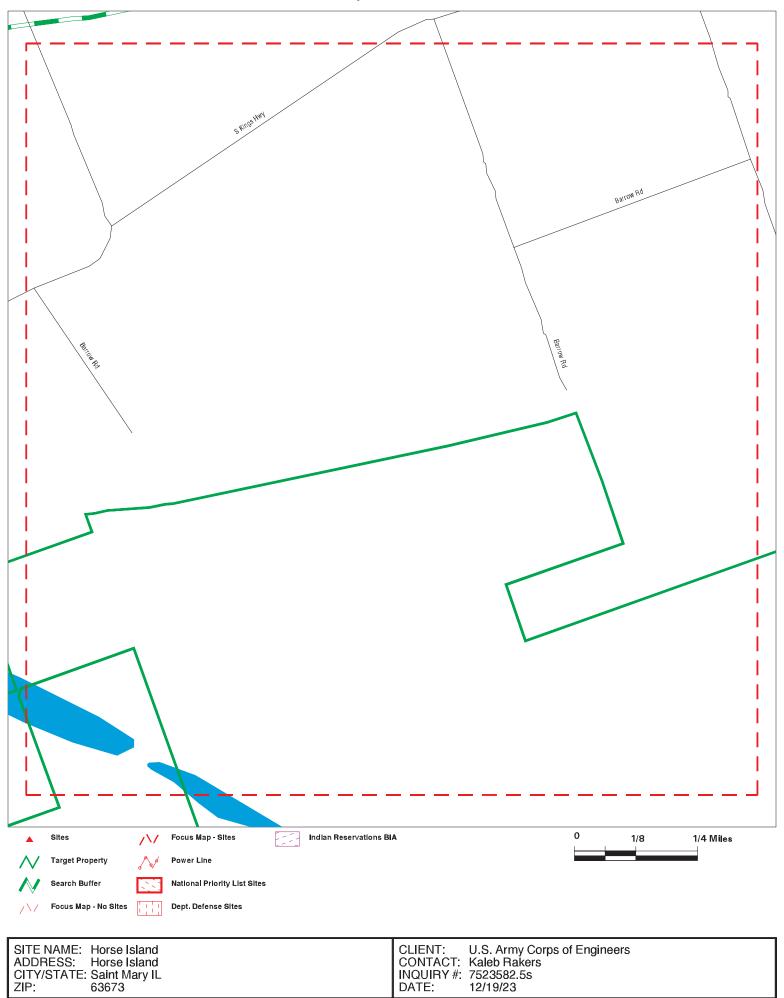
12/19/23

DATE:

Target Property: HORSE ISLAND SAINT MARY, IL 63673

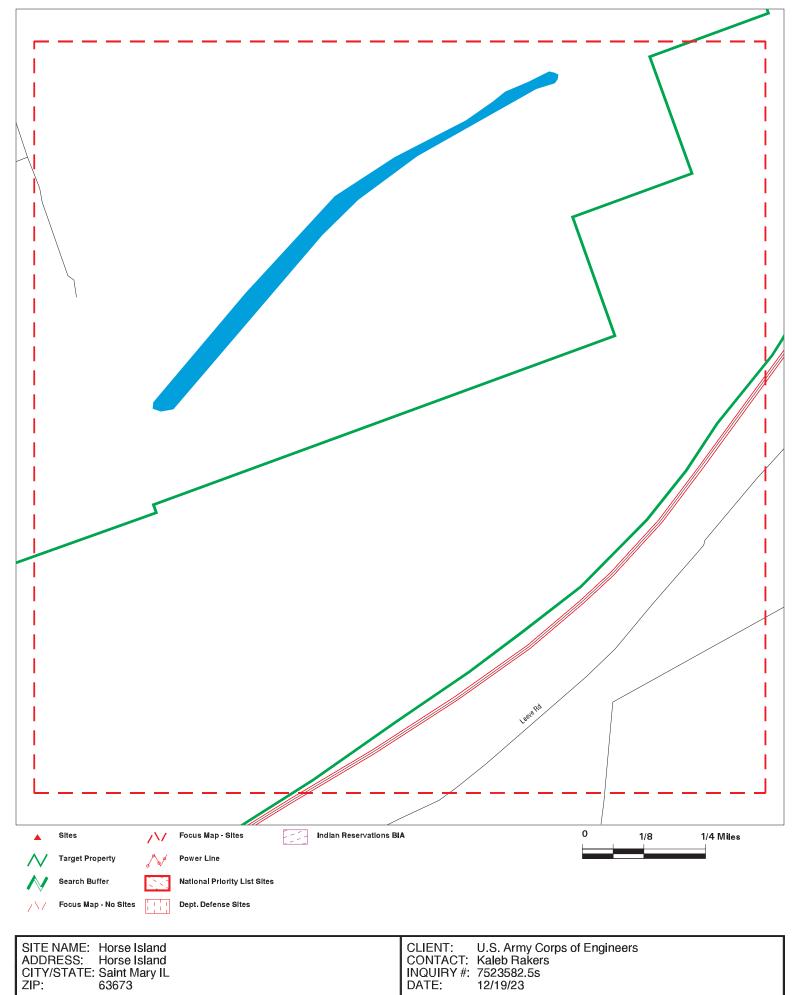
MAP ID / FOCUS		ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
A1 / 7	BARNETTS SIXTY SIX	650 2ND ST	EDR Hist Auto	573 0.109 SW
A2 / 7	BARNETT'S 66	HWY 61	MO LUST, MO UST	658 0.125 SSW
3/7	RITTER PAINTING COMP	132 3RD ST	RCRA NonGen / NLR. FINDS. ECHO	748 0.142 SW

Focus Map - 8 - 7523582.5s



Target Property: HORSE ISLAND SAINT MARY, IL 63673

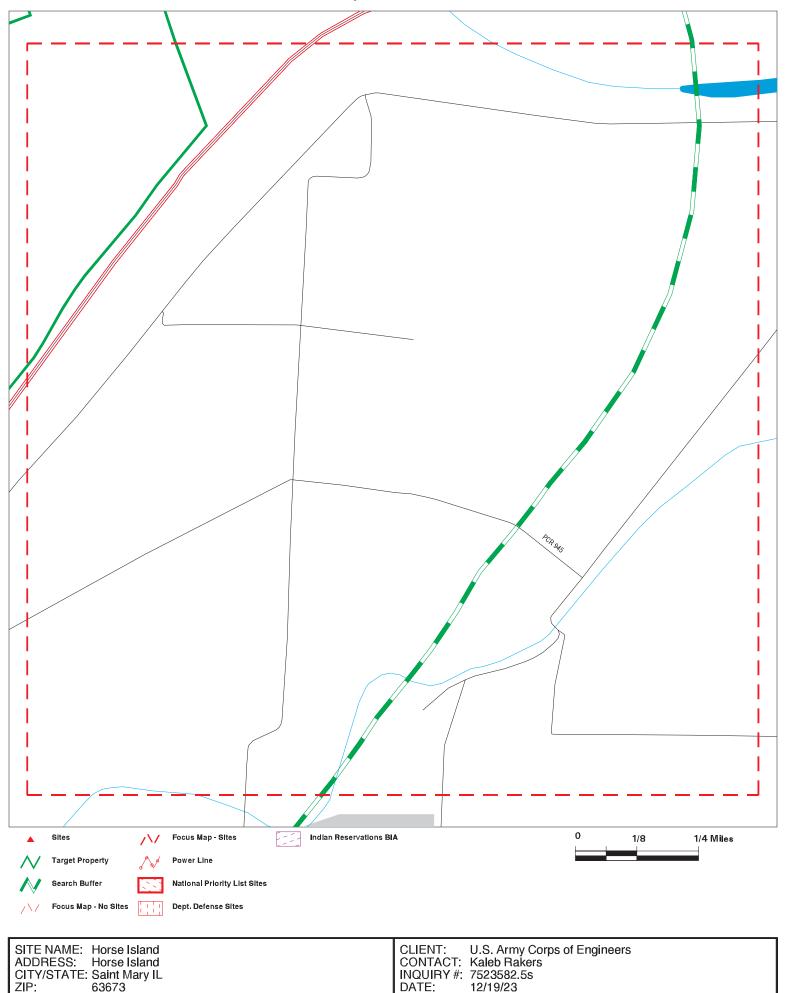
MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION



Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

Focus Map - 10 - 7523582.5s

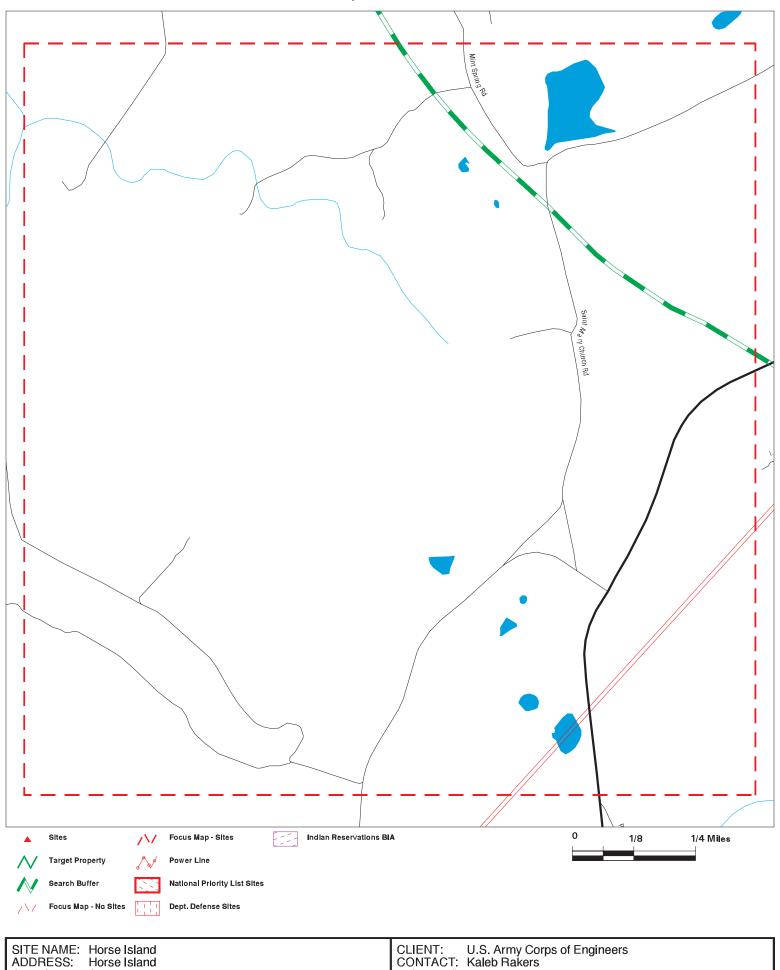


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Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

Focus Map - 11 - 7523582.5s



CITY/STATE: Saint Mary IL ZIP: 63673

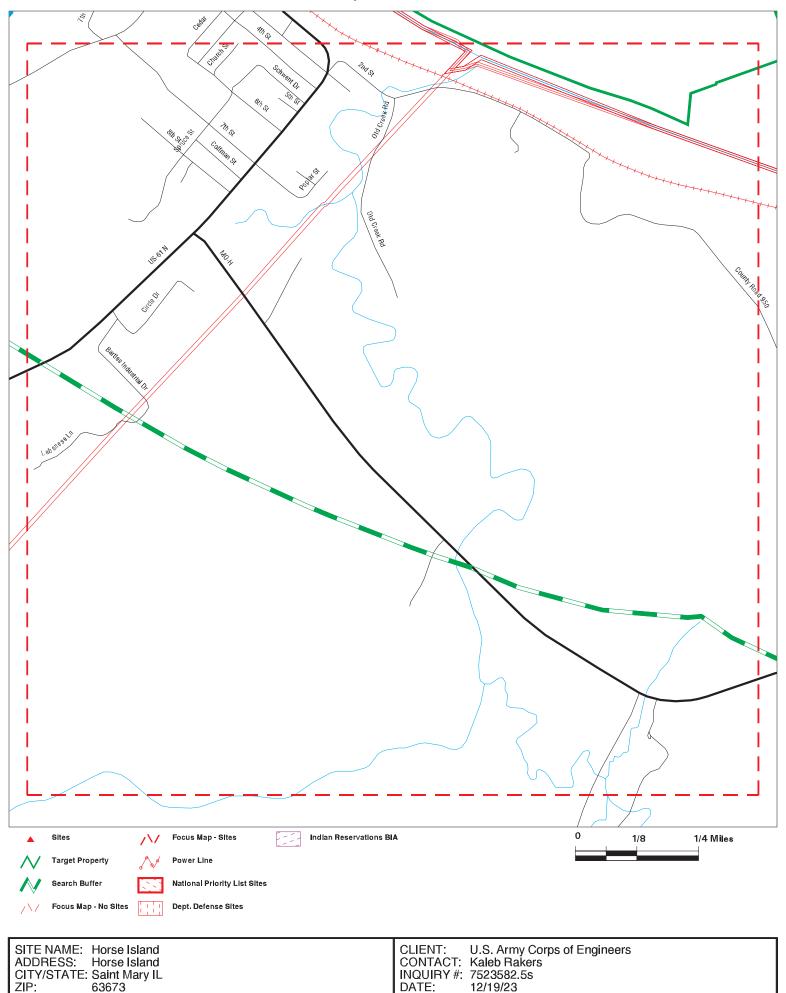
CLIENT: U.S. Army Cor CONTACT: Kaleb Rakers

INQUIRY#: 7523582.5s DATE: 12/19/23

Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

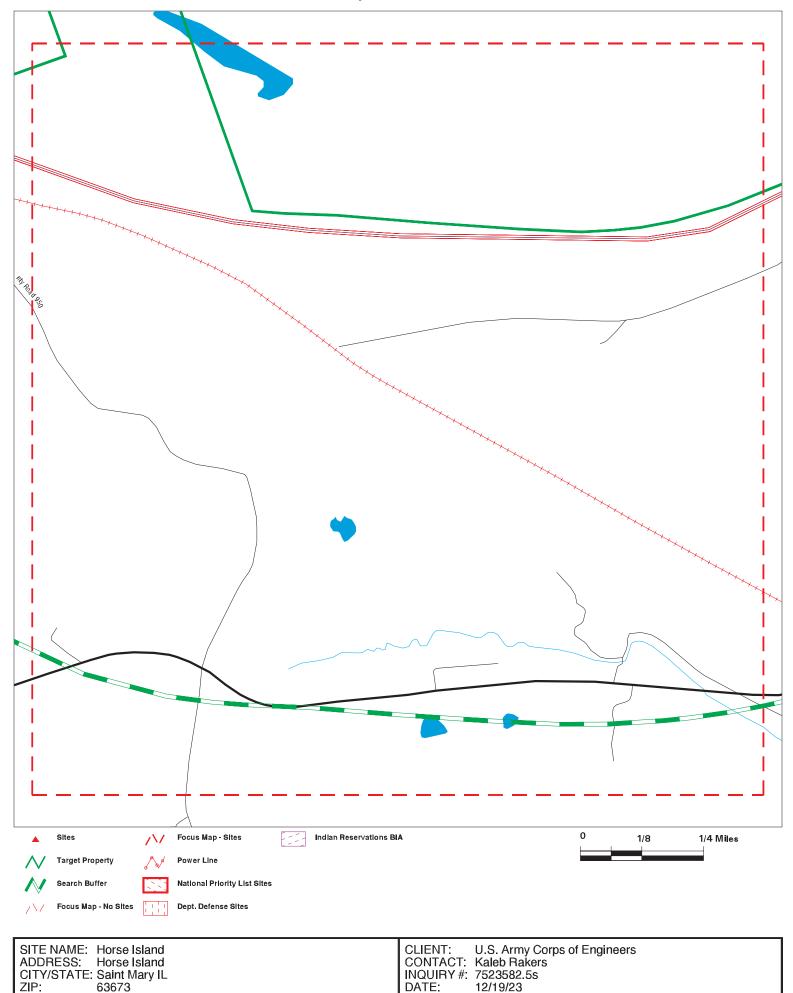
Focus Map - 12 - 7523582.5s



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Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

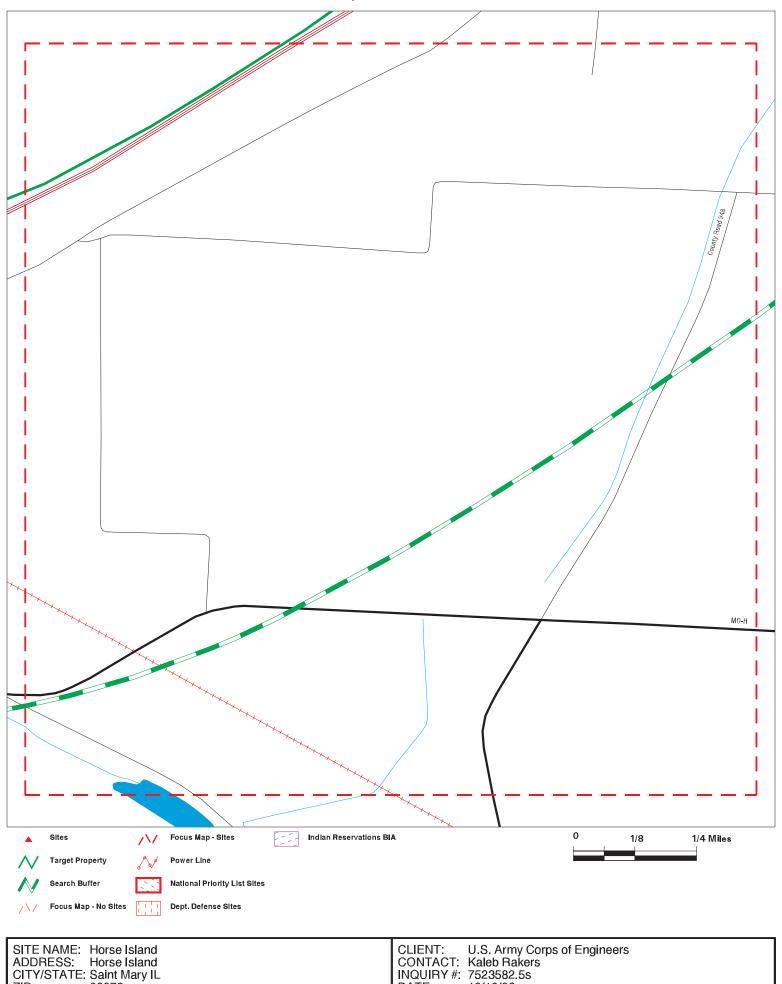


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Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

Focus Map - 14 - 7523582.5s



ZIP:

63673

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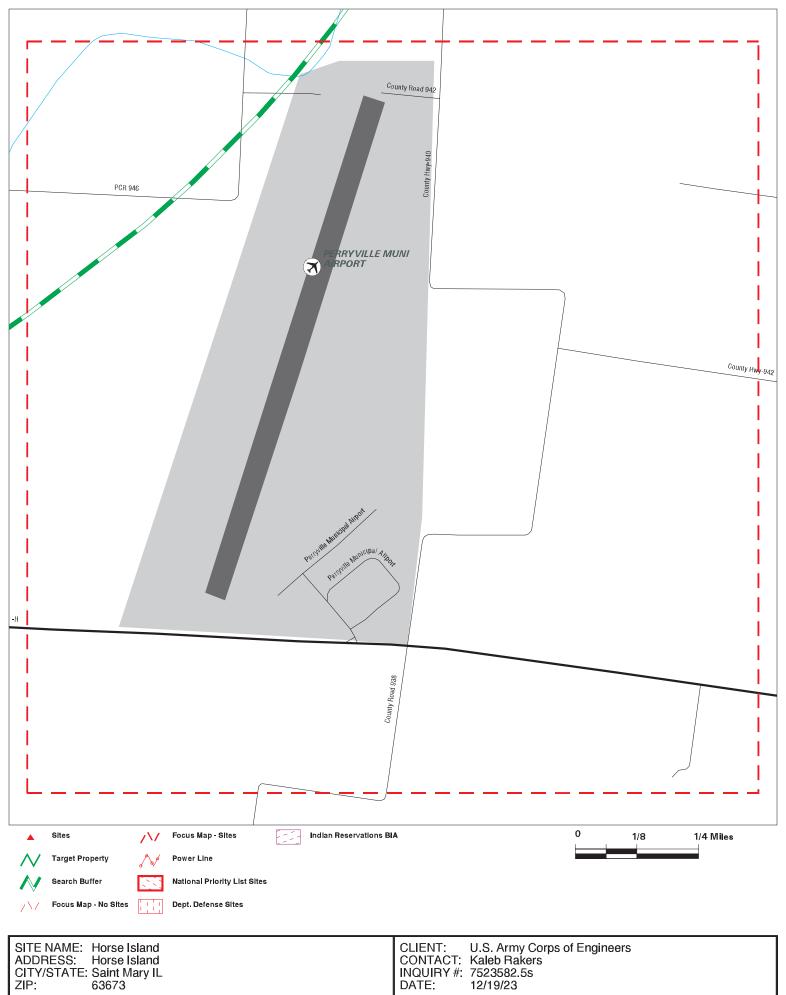
12/19/23

DATE:

Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

Focus Map - 15 - 7523582.5s



Target Property: HORSE ISLAND SAINT MARY, IL 63673

MAP ID / DIST (ft. & mi.) FOCUS MAP SITE NAME ADDRESS DATABASE ACRONYMS DIRECTION

Map ID MAP FINDINGS

Direction **EDR ID Number** Distance Elevation Site Database(s) **EPA ID Number**

Α1 **BARNETTS SIXTY SIX EDR Hist Auto** 1020873339 SW

650 2ND ST N/A

< 1/8 0.109 mi.

573 ft. Site 1 of 2 in cluster A

Actual:

EDR Hist Auto

SAINT MARY, MO 63673

386 ft.

Year: Name: Type: Focus Map:

2000 **BARNETTS SIXTY SIX** Gasoline Service Stations, NEC

U000751615 **A2 BARNETT'S 66** MO LUST **SSW MO UST HWY 61** N/A

< 1/8 **ST MARY, MO 63673**

0.125 mi.

658 ft. Site 2 of 2 in cluster A

LUST: Actual: 399 ft. Name: BARNETT'S 66 **HWY 61**

Address: Focus Map:

City,State,Zip: ST MARY, MO 63673 Facility ID: ST0006270

> Region: SE - Southeast Regional Office

Lat/Long (dms): 37 52 42 / 89 56 55 Spill Number: Not reported 11/10/1998 Release Date:

Release Type: UNDERGROUND STORAGE TANK

Date Cleanup Started: 11/10/1998 Date Cleanup Finished: 04/09/2013 Expedited: No

Expedited Date: Not reported

Expenditures From The American Recovery and Reinvestment Act of 2009o

Reopened Date: Not reported

Number Of Remediation Monitoring Wells: 4 Active:

Date Of NFA Letter From DNR: 2013-04-09 00:00:00

Date Record Meets Archive Criteria: Not reported Remediation ID: R006676 Rank: 52 **Emergeny Response Date:** Not reported **Emergency Cleanup Start:** Not reported

Referred To DGLS for Investigation: Contractor Performing Clean Up: 432 **RBCA NFA:** Yes Project Manager: W

Next Correspondence/Update With Fac: Not reported 12/29/1999 Date Added: Date Record Edited: 03/10/2014 Person Adding Or Editing Record: KUTTENKULER, J

Facility Sent To State Archive: Yes Date Remediation Unit Closed The File: Not reported

Site Affectd By Funding Level From PSTIFNo

General Comments: 12-29-99 D.L. Contamination remaining beneath the

dispensers in excess of the cleanup levels established for

the site. Requested a proposal to address the

contamination. 5/5/01 kk rev file. Sent update letter for closure def and SC plan. 8/20/01 call from Close Env. Working on SC plan and will submit. 01/13/02 kk rev file. Sent 2nd update letter. 5/30/02 MAS: Approved WP for SC with mod. 9/5/2002:HM:telephone from Ed Close. Just

Map ID Direction Distance Elevation

Site

MAP FINDINGS

Database(s)

EDR ID Number EPA ID Number

BARNETT'S 66 (Continued)

U000751615

received approval from owner to do the SC work. Report requested by DNR by Spet. 27. Reqest extension. I approved a 30 days extension starting September 5, 2002. 1/3/03: TC rvw invest results; sign contamination in soil and gw, in soil as deep as 26 feet (maybe more); ask for additional investigation, soil borings and mon wells to define extent; buildings might get in way, might need to go through floors or to other side. 7/28/03: TC rvw wp for site characterization; calls for 7 borings and 3 MW; approved plan with provisions that soil contam be defined by stepping out and RBCA parameters be collected (sent Ch 7). 3/25/04 MAS: approved request for extension of SC report in order to incorporate MRBCA software values. Filed a copy of Close Envir. Letter to PSTIF. 10/24/04 MAS: Started review of Close Envir SC/Tier I/II report. Noticed Close did not start recovery of 10 feet of FP found in B10 becase as he had not received approval, which of course is uneccessary in this case. The new consultant is Commonweatlh, so I faxed Carolyn a request to start FPR immediately. 11/12/04 MAS: Rev'd SC and Tier 1/2 report. Add't delineation required off site, collection of new geotech samples and free product recovery necessary at B10 (10" of FP). RA needs explanation for GW pathway and a reevaluation of TIER 2 SSTL, which are presented to be the same as tier 1 values. Faxed COmmonwealth, the new consultant, to notify them of FP and requested that FP recovery begin. 06/23/05 -New consultant: Keith Piontek, TRC Environmental Corp. Received proposal to submit workplan. Requested workplan to be submitted. - LL 8/29/05 MA Approved WP to perform additional SC to delineate the extent of soil and gw contamination on site and off-site, install recovery well to recover FP, perform quarterly gwm activities for one year to demonstarte plume's stablility. At the completion a report wil be submitted documenting findings. 1/5/06 MA Approved request for 45 day time extension to submit the report. 6/1/06:HM:Revd SC of 2/20/06 and GW report of 3/17/06. Waiting for an update RA report. 9/22/06 MA rev a groundwater monitoring report and a response letter. The plume appears to be stable and shrinking. The response letter adequately address's the department's comments of June 12, 2006. Requested the submittal of a complete risk assessment report. 5/29/08 JMH - Review RA report recommending NFA. Plume is stable, however, several Tier 1 forms are illegible thus preventing complete review of report. GW use and RAFU determinations require more documentation. Land Use maps do not show utilities or property boundaries. Issue comment letter requesting additional work and revised RA using residential RBTLs unless RAFU checklist is submitted. 02/03/10 LTA- Reviewed revised Tier 1 risk assessment. Multiple issues remain at the site. LNAPL was present during the last GWM event in RW-1, screens submerged in multiple monitoring wells on site, RCs miscalculated, GW use pathway appears to be complete, no plume stability evaluation. Requested evaluation of the effectivness of submerged wells and work plan for LNAPL recovery/GWM activities with in 60 days. 1/18/10 JK--rev response letter and wp; need signed and

Map ID MAP FINDINGS
Direction

Distance EDR ID Number Elevation Site EDR ID Number Database(s) EPA ID Number

BARNETT'S 66 (Continued) U000751615

seal for letter, need clarification for county water district connection, may need wells redeveloped, they will do 4 quarters of GWM and also do SVS at site; req GWM and SVS report and seal in 90 days, to include FPR report if necessary. 10/4/11 JK--rev GWM and SVS report; no COC's>DTLs in GW except lead and FP still in RW-1; no COCs in soil vapors; req next report of GW and SVS and FP recovery in 90 days. 12/23/2011 - HRM - Reviewed GWM and LNAPL recovery report. Mann-Kendall analysis indicates decreasing trends of N and MTBE in wells OMW-1, MW-1 and MW-2. Dept concurs. TRC recommends additional soil vapor sampling in Dec. Dept requested why SV sampling wasn't done in the summer of 2011 as was recommended. 3/8/12 JK--rev RA addendum and SVS report; SVS was not taken at three pts due to water in probes, addl sampling not necessary since area of concern by RW-1 was OK and non-detect concentrationcs in other samples: NFA letter cannot be issued at this time since RW-1 still has absorbent socks in it and TRC collected 0.29 gallons of FP; recommend remove socks and monitor RW-1 for FP and sample if no fp there, need addl information if FP is still there to determine if addl fp recovery is necessary; also no need to redevelop MWs. Req response in 90 days, 8/14/12 JK--rev wp foremoving absorbent socks from RW-1 and gauging for fp, if no FP is present then they will sample, if FP is present then they will re-evaluate FP recovery methods; approved wp and req report in 90 days. 3/13/13 JK--rev gwm report; socks were removed from RW-1 and left out for summer during drought conditions, gauged and sampled in July and August 2012; only a sheen re-appeared in RW-1; no further FP recovery appears necessary or practicable, discussed with Laura and drafted NFA. 4/9/13 Issued NFA 10/3/13 Jk--rev wp for GWM well abandonment, drafted response letter 3/10/14 JK--rev wwell abandonment report, drafted letter.

UST:

Facility ID: ST0006270
Region: SE
Easting: 768375.426
Northing: 4196727.63

Owner Of Geospatial Data: Hazardous Waste Program

Geospatial Data Collected By: CON_Fortin,Joel Date GIS Data Collected: 04/19/2014

Lat/Long: 37.87833 / -89.94861 Lat/Long (dms): 37.52.42 / 89.56.55

Tanks:

Owner:

Owner ID: OW00399

Owner Name: BAUMAN OIL & MATERIAL INC

Owner Address: JCT HWY 61 & 32

Owner City,St,Zip: STE GENEVIEVE, MO 63670

Owner County Code: 186
Owner Phone: 8835767
Mail Was Not Deliverable: No
Is Owner Active?: No

Date Registration Received: Not reported

Map ID MAP FINDINGS

Direction Distance

Elevation Site Database(s) EPA ID Number

BARNETT'S 66 (Continued) U000751615

Date Record Added: 1995-06-30 00:00:00
Date Record Edited: 2012-03-07 00:00:00
Name of Person Editing Record: KIRCHNER, M

Tank ID: 1
Tank Double Wall: 0

Tank Type: Below Ground **Tank Status:** Removed Meet 98 Update Requirements: Not reported Date Tank Installed: 01/01/1980 Tank Material: Steel Code for Tank Material Manufacturer: Not reported Code for Tank Installer: Not reported Other Type Of Tank Material: Not reported Tank Internal Protection: Not reported Not reported Other Tank Internal Protection: Tank Internal Protection Date: Not reported Tank External Protection: Not reported Other Type Tank Extrn Protec: Not reported Tank External Protec Date: Not reported Date Tank Last Used: 09/01/1998 Date Tank Permanently Closed/ Removed:11/09/1998

Dt Tk Exp Brought InUse/Internal Tracking:

Tank Fees Waived: No Expedite Closure On Tank?: No

Responsible Person Expediting Closure: Not reported Temporary Status Verified Date: Not reported Admin Fee 585: Not reported Not reported Date Administratively Closed: Date Record Added: 06/30/1995 Date Record Edited: 02/11/1999 Person Adding/Editing Record: NREQHW-WILDB Date Of NFA Letter: 11/09/1998

Is Tank Used For Emergency Generator: No

Date Closure Notice Received: 11/02/1998
Date Of Aprroval Letter: 11/09/1998

Firm Closing Tank: HOPKINS ENVIRONMENTAL

Date Closure Report Received: 11/29/1999
Registration End Date: Not reported
LockOut Flag: No

Comments: Not reported

Tank Compartment:

Tanks Use: False Compartment No: Tank Compartment PK: 15715 Tank PK: 15715 Not reported Case Number: Compartment Status: Removed Compartment Temp Verified Dt: Not reported Capacity: 560 Substance: Diesel Substance Other: Not reported

Hazardous Substance: Not reported Not reported Not reported Mixture: False

Date of Last Use: 1998-09-01 00:00:00
Pipe Installation Date: 1980-01-01 00:00:00

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EDR ID Number

Not reported

MAP FINDINGS Map ID Direction

Distance Elevation

Site Database(s) **EPA ID Number**

BARNETT'S 66 (Continued)

U000751615

EDR ID Number

Pipe System: Not reported

Pipe Material:

Pipe Material Other: Not reported Pipe Protection: Not reported Pipe Protection Date: Not reported

Pipe Double Wall: Spill Protection: False

Owner:

Tank Type:

OW00399 Owner ID:

Owner Name: **BAUMAN OIL & MATERIAL INC**

JCT HWY 61 & 32 Owner Address:

Owner City, St, Zip: STE GENEVIEVE, MO 63670

Owner County Code: 186 Owner Phone: 8835767 Mail Was Not Deliverable: No Is Owner Active?: No

Date Registration Received: Not reported 1995-06-30 00:00:00 Date Record Added: 2012-03-07 00:00:00 Date Record Edited: Name of Person Editing Record: KIRCHNER, M

2 Tank ID: 0 Tank Double Wall:

Tank Status: Removed Meet 98 Update Requirements: Not reported 01/01/1970 Date Tank Installed: Tank Material: Steel Code for Tank Material Manufacturer: Not reported Code for Tank Installer: Not reported Other Type Of Tank Material: Not reported Tank Internal Protection: Not reported Other Tank Internal Protection: Not reported Tank Internal Protection Date: Not reported Tank External Protection: Not reported Other Type Tank Extrn Protec: Not reported Tank External Protec Date: Not reported Date Tank Last Used: 09/01/1998 Date Tank Permanently Closed/ Removed:11/09/1998

Dt Tk Exp Brought InUse/Internal Tracking:

Not reported

Below Ground

Tank Fees Waived: No Expedite Closure On Tank?: No

Responsible Person Expediting Closure: Not reported Temporary Status Verified Date: Not reported Admin Fee 585: Not reported Date Administratively Closed: Not reported Date Record Added: 06/30/1995 Date Record Edited: 02/11/1999 Person Adding/Editing Record: NREQHW-WILDB Date Of NFA Letter: 11/09/1998

Is Tank Used For Emergency Generator: No

Date Closure Notice Received: 11/02/1998 Date Of Aprroval Letter: 11/09/1998

HOPKINS ENVIRONMENTAL Firm Closing Tank:

MAP FINDINGS Map ID

Direction Distance

EDR ID Number Elevation Site Database(s) **EPA ID Number**

BARNETT'S 66 (Continued) U000751615

Date Closure Report Received: 11/29/1999 Not reported Registration End Date:

LockOut Flag: No

Comments: Not reported

Tank Compartment:

Tanks Use: False Compartment No: Tank Compartment PK: 15716 Tank PK: 15716 Case Number: Not reported Compartment Status: Removed Compartment Temp Verified Dt: Not reported Capacity: 1000

Substance: Gasoline, Including Blends

Substance Other: Not reported Hazardous Substance: Not reported Mixture: False

Date of Last Use: 1998-09-01 00:00:00 Pipe Installation Date: 1970-01-01 00:00:00

Pipe System: Not reported

Pipe Material:

Pipe Material Other: Not reported Pipe Protection: Not reported Not reported Pipe Protection Date:

Pipe Double Wall: Spill Protection: False

Owner:

Owner ID: OW00399

Owner Name: **BAUMAN OIL & MATERIAL INC**

Owner Address: JCT HWY 61 & 32

Owner City, St, Zip: STE GENEVIEVE, MO 63670

Owner County Code: 186 Owner Phone: 8835767 Mail Was Not Deliverable: No Is Owner Active?: No

Date Registration Received: Not reported 1995-06-30 00:00:00 Date Record Added: Date Record Edited: 2012-03-07 00:00:00

Name of Person Editing Record: KIRCHNER, M

Tank ID: 3 Tank Double Wall:

Tank Type: Below Ground Tank Status: Removed Meet 98 Update Requirements: Not reported Date Tank Installed: 01/01/1970 Tank Material: Steel Code for Tank Material Manufacturer: Not reported Not reported Code for Tank Installer: Other Type Of Tank Material: Not reported Tank Internal Protection: Not reported Other Tank Internal Protection: Not reported Tank Internal Protection Date: Not reported

Map ID MAP FINDINGS

Direction Distance

Elevation Site Database(s) EPA ID Number

BARNETT'S 66 (Continued) U000751615

Tank External Protection:
Other Type Tank Extrn Protec:
Not reported
Tank External Protec Date:
Not reported
Date Tank Last Used:
09/01/1998
Date Tank Permanently Closed/ Removed:11/09/1998

Dt Tk Exp Brought InUse/Internal Tracking: Not reported

Tank Fees Waived: No Expedite Closure On Tank?: No

Responsible Person Expediting Closure: Not reported Temporary Status Verified Date: Not reported Admin Fee 585: Not reported Date Administratively Closed: Not reported 06/30/1995 Date Record Added: Date Record Edited: 02/11/1999 Person Adding/Editing Record: NREQHW-WILDB Date Of NFA Letter: 11/09/1998

Is Tank Used For Emergency Generator: No

Date Closure Notice Received: 11/02/1998
Date Of Aprroval Letter: 11/09/1998

Firm Closing Tank: HOPKINS ENVIRONMENTAL

Date Closure Report Received: 11/29/1999
Registration End Date: Not reported
LockOut Flag: No

Comments: Not reported

Tank Compartment:

Tanks Use: False

Compartment No: 1

Tank Compartment PK: 15717

Tank PK: 15717

Case Number: Not reported

Compartment Status: Removed

Compartment Temp Verified Dt: Not reported

Capacity: 1000

Substance: Gasoline, Including Blends

Substance Other: Not reported Hazardous Substance: Not reported

Mixture: False

Date of Last Use: 1998-09-01 00:00:00
Pipe Installation Date: 1970-01-01 00:00:00

Pipe System: Not reported

Pipe Material:

Pipe Material Other: Not reported Pipe Protection: Not reported Pipe Protection Date: Not reported

Pipe Double Wall: 0
Spill Protection: False

Tank Aug 2011:

Facility Id: ST0006270

Tank ld: 1

Site Usage: Not reported Risk Type: Not reported Soil Type: Not reported GW Flow: Not reported Offsite Impact: Not reported

EDR ID Number

MAP FINDINGS Map ID

Direction Distance

EDR ID Number Elevation Site Database(s) **EPA ID Number**

BARNETT'S 66 (Continued) U000751615

Free Product: Not reported Not reported **Drinking Water:** Closed Under: Not reported

No Drinking Wells: No No Buildings: No Vapor Barrier: 0 St Louis Mo: No Special Well Area: No Surface Cap: No No Excavation: No

ST0006270 Facility Id:

Tank ld:

Site Usage: Not reported Risk Type: Not reported Soil Type: Not reported GW Flow: Not reported Not reported Offsite Impact: Free Product: Not reported Not reported **Drinking Water:** Closed Under: Not reported

No Drinking Wells: No No Buildings: No Vapor Barrier: 0 St Louis Mo: No Special Well Area: No Surface Cap: No No Excavation: No

ST0006270 Facility Id:

Tank ld:

Site Usage: Not reported Risk Type: Not reported Soil Type: Not reported GW Flow: Not reported Offsite Impact: Not reported Free Product: Not reported **Drinking Water:** Not reported Closed Under: Not reported

No Drinking Wells: No No Buildings: No Vapor Barrier: 0 St Louis Mo: No Special Well Area: No Surface Cap: No No Excavation: No

3 RITTER PAINTING COMPANY

SW 132 3RD ST 1/8-1/4 **ST MARY, MO 63673**

0.142 mi. 748 ft.

Actual: RCRA Listings:

452 ft. Date Form Received by Agency: Handler Name: Focus Map:

Handler Address: Handler City, State, Zip:

20161230 Ritter Painting Company 132 3RD ST

ST MARY, MO 63673-9306

RCRA NonGen / NLR

FINDS

ECHO

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1004740387

MO0000887331

Map ID MAP FINDINGS

Distance Elevation Site

n Site Database(s) EPA ID Number

RITTER PAINTING COMPANY (Continued)

1004740387

EDR ID Number

 EPA ID:
 MO0000887331

 Contact Name:
 LARRY RITTER

 Contact Address:
 8284 RIVERS HILL LN

 Contact City, State, Zip:
 STE GENEVIEVE, MO 63670

Contact Telephone: 573-883-3318
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: MANAGER
EPA Region: 07
Land Type: Private

Federal Waste Generator Description: Not a generator, verified

Non-Notifier: Not reported Biennial Report Cycle: Not reported Accessibility: Not reported Active Site Indicator: Not reported State District Owner: Not reported State District: Not reported

Mailing Address: 8284 RIVERS HILL LN
Mailing City,State,Zip: STE GENEVIEVE, MO 63670

Owner Name: Larry Ritter Owner Type: Private Operator Name: Larry Ritter Operator Type: Private Short-Term Generator Activity: No Importer Activity: No Mixed Waste Generator: No Transporter Activity: Nο Transfer Facility Activity: No Recycler Activity with Storage: No Small Quantity On-Site Burner Exemption: No Smelting Melting and Refining Furnace Exemption: No **Underground Injection Control:** No Off-Site Waste Receipt: No Universal Waste Indicator: No Universal Waste Destination Facility: No Federal Universal Waste: No Active Site State-Reg Handler:

Federal Facility Indicator: Not reported

Hazardous Secondary Material Indicator: NN

Sub-Part K Indicator:Not reported2018 GPRA Permit Baseline:Not on the Baseline2018 GPRA Renewals Baseline:Not on the Baseline

202 GPRA Corrective Action Baseline:

Subject to Corrective Action Universe:

No
Non-TSDFs Where RCRA CA has Been Imposed Universe:

No

Corrective Action Priority Ranking: No NCAPS ranking

Environmental Control Indicator: No Institutional Control Indicator: No Human Exposure Controls Indicator: N/A Groundwater Controls Indicator: N/A Significant Non-Complier Universe: No Unaddressed Significant Non-Complier Universe: No Addressed Significant Non-Complier Universe: No Significant Non-Complier With a Compliance Schedule Universe: No

Financial Assurance Required:
Handler Date of Last Change:
Recognized Trader-Importer:
No
Not reported
20170113
No

MAP FINDINGS Map ID Direction

Distance

EDR ID Number Elevation Site Database(s) **EPA ID Number**

RITTER PAINTING COMPANY (Continued)

1004740387

Recognized Trader-Exporter: No Importer of Spent Lead Acid Batteries: No Exporter of Spent Lead Acid Batteries: No

Recycler Activity Without Storage: Not reported Manifest Broker: Not reported

Sub-Part P Indicator: No

Handler - Owner Operator:

Owner/Operator Indicator: Owner

Owner/Operator Name: LARRY RITTER

Legal Status: Private Date Became Current: 19940928 Date Ended Current: Not reported Owner/Operator Address: Not reported Owner/Operator City, State, Zip: Not reported Owner/Operator Telephone: Not reported Owner/Operator Telephone Ext: Not reported Owner/Operator Fax: Not reported Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner

Owner/Operator Name: LARRY RITTER

Legal Status: Private Date Became Current: Not reported Date Ended Current: Not reported

8284 RIVERS HILL LN Owner/Operator Address: Owner/Operator City, State, Zip: ST GENEVIEVE, MO 63670

Owner/Operator Telephone: 573-883-3318 Owner/Operator Telephone Ext: Not reported Owner/Operator Fax: Not reported Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator

Owner/Operator Name: LARRY RITTER

Legal Status: Private Date Became Current: 19940928 Date Ended Current: Not reported Owner/Operator Address: Not reported Owner/Operator City, State, Zip: Not reported Owner/Operator Telephone: Not reported Owner/Operator Telephone Ext: Not reported Owner/Operator Fax: Not reported Owner/Operator Email: Not reported

Historic Generators:

Receive Date: 20161230

Handler Name: RITTER PAINTING COMPANY

Federal Waste Generator Description: Not a generator, verified

State District Owner: Not reported

Large Quantity Handler of Universal Waste: No Recognized Trader Importer: No Recognized Trader Exporter: No Spent Lead Acid Battery Importer: No Spent Lead Acid Battery Exporter: No Current Record: Yes Map ID MAP FINDINGS

Distance Elevation Site EDR ID Number

Database(s) EPA ID Number

RITTER PAINTING COMPANY (Continued)

1004740387

Non Storage Recycler Activity: Not reported Electronic Manifest Broker: Not reported

Receive Date: 19940928

Handler Name: RITTER PAINTING COMPANY

Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator

State District Owner: Not reported

Large Quantity Handler of Universal Waste: No Recognized Trader Importer: No Recognized Trader Exporter: No Spent Lead Acid Battery Importer: No Spent Lead Acid Battery Exporter: No Current Record: No

Non Storage Recycler Activity:

Not reported Electronic Manifest Broker:

Not reported

Receive Date: 20001208

Handler Name: RITTER PAINTING COMPANY

Federal Waste Generator Description: Not a generator, verified

State District Owner: Not reported

Large Quantity Handler of Universal Waste: No Recognized Trader Importer: No Recognized Trader Exporter: No Spent Lead Acid Battery Importer: No Spent Lead Acid Battery Exporter: No Current Record: No

Non Storage Recycler Activity:

Not reported Electronic Manifest Broker:

Not reported

List of NAICS Codes and Descriptions:

NAICS Code: 56291

NAICS Description: REMEDIATION SERVICES

Facility Has Received Notices of Violations:

Violations: No Violations Found

Evaluation Action Summary:

Evaluations: No Evaluations Found

FINDS:

Registry ID: 110003937429

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:

The Missouri Department of Natural Resources (MO-DNR) involves a resource assessment and monitoring program, biological criteria development, monitoring of targeted sites to determine compliance with the designated use of aquatic life protection in the standards, monitoring for 303(3) purposes, and the development of a stream classification framework.

The Resource Conservation and Recovery Act Information System (RCRAInfo) is EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. It tracks many

Map ID MAP FINDINGS Direction

Distance

Elevation Site Database(s) EPA ID Number

RITTER PAINTING COMPANY (Continued)

1004740387

EDR ID Number

types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.

<u>Click this hyperlink</u> while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid: 1004740387 Registry ID: 110003937429

DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110003937429

Name: RITTER PAINTING COMPANY

Address: 132 3RD ST

City, State, Zip: ST MARY, MO 63673

Count: 0 records ORPHAN SUMMARY

City EDR ID Site Name Site Address Zip Database(s)

NO SITES FOUND

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 09/19/2023 Source: EPA
Date Data Arrived at EDR: 10/03/2023 Telephone: N/A

Number of Days to Update: 16 Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources

EPA's Environmental Photographic Interpretation Center (EPIC)

Telephone: 202-564-7333

EPA Region 1 EPA Region 6

Telephone 617-918-1143 Telephone: 214-655-6659

EPA Region 3 EPA Region 7

Telephone 215-814-5418 Telephone: 913-551-7247

EPA Region 4 EPA Region 8

Telephone 404-562-8033 Telephone: 303-312-6774

EPA Region 5 EPA Region 9

Telephone 312-886-6686 Telephone: 415-947-4246

EPA Region 10

Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 09/19/2023 Source: EPA
Date Data Arrived at EDR: 10/03/2023 Telephone: N/A

Date Made Active in Reports: 10/19/2023 Last EDR Contact: 12/04/2023

Number of Days to Update: 16 Next Scheduled EDR Contact:

Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991 Date Data Arrived at EDR: 02/02/1994 Date Made Active in Reports: 03/30/1994

Number of Days to Update: 56

Source: EPA

Telephone: 202-564-4267 Last EDR Contact: 08/15/2011

Next Scheduled EDR Contact: 11/28/2011 Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Source: EPA

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Telephone: N/A Last EDR Contact: 12/04/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 09/25/2023 Date Data Arrived at EDR: 09/26/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 77

Source: Environmental Protection Agency Telephone: 703-603-8704

Last EDR Contact: 09/26/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Source: EPA

Telephone: 800-424-9346 Last EDR Contact: 12/04/2023

Next Scheduled EDR Contact: 01/22/2024 Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Source: EPA

Telephone: 800-424-9346 Last EDR Contact: 12/04/2023

Next Scheduled EDR Contact: 01/22/2024 Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/04/2023 Date Data Arrived at EDR: 12/06/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 6

Source: EPA

Telephone: 800-424-9346 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/04/2023 Date Data Arrived at EDR: 12/06/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 6

Source: Environmental Protection Agency

Telephone: 312-886-6186 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/04/2023 Date Data Arrived at EDR: 12/06/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 6

Source: Environmental Protection Agency

Telephone: 312-886-6186 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/04/2023 Date Data Arrived at EDR: 12/06/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 6

Source: Environmental Protection Agency

Telephone: 312-886-6186 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation
and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database
includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste
as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate
less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/04/2023 Date Data Arrived at EDR: 12/06/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 6

Source: Environmental Protection Agency

Telephone: 312-886-6186 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/03/2023 Date Data Arrived at EDR: 08/07/2023 Date Made Active in Reports: 10/10/2023

Number of Days to Update: 64

Source: Department of the Navy Telephone: 843-820-7326 Last EDR Contact: 11/02/2023

Next Scheduled EDR Contact: 02/19/2024 Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/21/2023 Date Data Arrived at EDR: 08/21/2023 Date Made Active in Reports: 11/07/2023

Number of Days to Update: 78

Source: Environmental Protection Agency

Telephone: 703-603-0695 Last EDR Contact: 11/17/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/21/2023 Date Data Arrived at EDR: 08/21/2023 Date Made Active in Reports: 11/07/2023

Number of Days to Update: 78

Source: Environmental Protection Agency

Telephone: 703-603-0695 Last EDR Contact: 11/17/2023

Next Scheduled EDR Contact: 03/04/2024

Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous

substances.

Date of Government Version: 09/18/2023 Date Data Arrived at EDR: 09/20/2023 Date Made Active in Reports: 12/11/2023

Number of Days to Update: 82

Source: National Response Center, United States Coast Guard

Telephone: 202-267-2180 Last EDR Contact: 12/13/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

SSU: State Sites Unit Listing

The State Response Action Program database identifies the status of all sites under the responsibility of the

Illinois EPA's State Sites Unit.

Date of Government Version: 03/23/2022 Date Data Arrived at EDR: 03/23/2022 Date Made Active in Reports: 06/17/2022

Number of Days to Update: 86

Source: Illinois Environmental Protection Agency

Telephone: 217-524-4826 Last EDR Contact: 10/16/2023

Next Scheduled EDR Contact: 01/29/2024

Data Release Frequency: Varies

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF: Available Disposal for Solid Waste in Illinois - Solid Waste Landfills Subject to State Surcharge Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/31/2021 Date Data Arrived at EDR: 10/19/2022 Date Made Active in Reports: 01/05/2023

Number of Days to Update: 78

Source: Illinois Environmental Protection Agency

Telephone: 217-785-8604 Last EDR Contact: 10/17/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Annually

CCDD: Clean Construction or Demolition Debris

Construction and demolition (C and D) debris is nonhazardous, uncontaminated material resulting from construction, remodeling, repair, or demolition of utilities, structures, and roads.

Date of Government Version: 09/11/2020 Date Data Arrived at EDR: 10/28/2020 Date Made Active in Reports: 12/09/2020

Number of Days to Update: 42

Source: Illinois EPA Telephone: 217-524-3300 Last EDR Contact: 10/02/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

LF WMRC: Waste Management & Research Center Landfill Database

The Waste Management & Research Center Landfill Database includes records from the Department of Public Health, Department of Mines & Minerals, Illinois Environmental Protection Agency, State Geological Survey, Northeastern Illinois Planning Commission and Pollution Control Board.

Date of Government Version: 12/31/2001 Date Data Arrived at EDR: 10/06/2006 Date Made Active in Reports: 11/06/2006

Number of Days to Update: 31

Source: Department of Natural Resources

Telephone: 217-333-8940 Last EDR Contact: 09/18/2009

Next Scheduled EDR Contact: 12/28/2009 Data Release Frequency: No Update Planned

LF SPECIAL WASTE: Special Waste Site List

These landfills, as of January 1, 1990, accept non-hazardous special waste pursuant to the Illinois EPA Non-Hazardous Special Waste Definition. List A includes landfills that may receive any non-hazardous waste, Non-Regional Pollution Control Facilities are so noted. List B includes landfills designed to receive specific non-hazardous wastes. List B landfills are designated as a Regional Pollution Control Facility by RPCF, or Non-Regional Pollution Control Facility by Non-RPCF.

Date of Government Version: 01/01/1990 Date Data Arrived at EDR: 06/17/2009 Date Made Active in Reports: 07/15/2009

Number of Days to Update: 28

Source: Illinois EPA Telephone: 217-782-9288 Last EDR Contact: 06/10/2009 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

IL NIPC: Solid Waste Landfill Inventory

Solid Waste Landfill Inventory. NIPC is an inventory of active and inactive solid waste disposal sites, based on state, local government and historical archive data. Included are numerous sites which previously had never been identified largely because there was no obligation to register such sites prior to 1971.

Date of Government Version: 08/01/1988 Date Data Arrived at EDR: 04/07/2022 Date Made Active in Reports: 07/01/2022

Number of Days to Update: 85

Source: Northeastern Illinois Planning Commission

Telephone: 312-454-0400 Last EDR Contact: 04/07/2022

Next Scheduled EDR Contact: 07/18/2022 Data Release Frequency: No Update Planned

Lists of state and tribal leaking storage tanks

LUST: Leaking Underground Storage Tank Sites

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 07/17/2023 Date Data Arrived at EDR: 07/18/2023 Date Made Active in Reports: 10/03/2023

Number of Days to Update: 77

Source: Illinois Environmental Protection Agency

Telephone: 217-524-3300 Last EDR Contact: 10/17/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Semi-Annually

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 4 Telephone: 404-562-8677 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 1 Telephone: 617-918-1313 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/19/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 8 Telephone: 303-312-6271 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/25/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 7 Telephone: 913-551-7003 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/19/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: Environmental Protection Agency

Telephone: 415-972-3372 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/14/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA, Region 5 Telephone: 312-886-7439 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/26/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 6 Telephone: 214-665-6597 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 10 Telephone: 206-553-2857 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

LUST TRUST: Underground Storage Tank Fund Payment Priority List

In case sufficient funds are not available in the Underground Storage Tank Fund, requests for payment are entered on the Payment Priority List by "queue date" order. As required by the Environmental Protection Act, the queue date is the date that a complete request for partial or final payment was received by the Agency. The queue date is "officially" confirmed at the end of the payment review process when a Final Decision Letter is sent to the site owner.

Date of Government Version: 06/06/2016 Date Data Arrived at EDR: 07/27/2016 Date Made Active in Reports: 10/18/2016

Number of Days to Update: 83

Source: Illinois EPA Telephone: 217-782-6762 Last EDR Contact: 10/10/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 03/08/2023 Date Data Arrived at EDR: 03/09/2023 Date Made Active in Reports: 05/30/2023

Number of Days to Update: 82

Source: FEMA

Telephone: 202-646-5797 Last EDR Contact: 10/10/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

UST: Underground Storage Tank Facility List

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 07/17/2023 Date Data Arrived at EDR: 07/18/2023 Date Made Active in Reports: 10/03/2023

Number of Days to Update: 77

Source: Illinois State Fire Marshal Telephone: 217-785-0969 Last EDR Contact: 10/17/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Quarterly

AST: Above Ground Storage Tanks

Listing of all aboveground tanks inspected by Office of State Fire Marshal.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 08/14/2023 Date Made Active in Reports: 10/31/2023

Number of Days to Update: 78

Source: State Fire Marshal Telephone: 217-785-1011 Last EDR Contact: 11/08/2023

Next Scheduled EDR Contact: 02/26/2024

Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/19/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 9 Telephone: 415-972-3368 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 4 Telephone: 404-562-9424 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 10 Telephone: 206-553-2857 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024

Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/26/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 6 Telephone: 214-665-7591 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/14/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 5 Telephone: 312-886-6136 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA, Region 1 Telephone: 617-918-1313 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/25/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 7 Telephone: 913-551-7003 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024

Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/20/2023 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 07/14/2023

Number of Days to Update: 66

Source: EPA Region 8 Telephone: 303-312-6137 Last EDR Contact: 10/11/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Sites with Engineering Controls

Sites using of engineered barriers (e.g., asphalt or concrete paving).

Date of Government Version: 09/25/2023 Date Data Arrived at EDR: 09/26/2023 Date Made Active in Reports: 12/14/2023

Number of Days to Update: 79

Source: Illinois Environmental Protection Agency

Telephone: 217-782-6761 Last EDR Contact: 09/26/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Quarterly

Inst Control: Institutional Controls

Legal or administrative restrictions on land use and/or other activities (e.g., groundwater use restrictions) which effectively limit exposure to contamination may be employed as alternatives to removal or treatment of contamination.

Date of Government Version: 09/25/2023 Date Data Arrived at EDR: 09/26/2023 Date Made Active in Reports: 12/14/2023

Number of Days to Update: 79

Source: Illinois Environmental Protection Agency

Telephone: 217-782-6761 Last EDR Contact: 09/26/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Quarterly

Lists of state and tribal voluntary cleanup sites

SRP: Site Remediation Program Database

The database identifies the status of all voluntary remediation projects administered through the pre-notice site cleanup program (1989 to 1995) and the site remediation program (1996 to the present).

Date of Government Version: 09/25/2023 Date Data Arrived at EDR: 09/26/2023 Date Made Active in Reports: 12/14/2023

Number of Days to Update: 79

Source: Illinois Environmental Protection Agency

Telephone: 217-785-9407 Last EDR Contact: 09/26/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Semi-Annually

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015 Date Data Arrived at EDR: 09/29/2015 Date Made Active in Reports: 02/18/2016

Number of Days to Update: 142

Source: EPA, Region 1 Telephone: 617-918-1102 Last EDR Contact: 12/12/2023

Next Scheduled EDR Contact: 04/01/2024

Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008 Date Data Arrived at EDR: 04/22/2008 Date Made Active in Reports: 05/19/2008

Number of Days to Update: 27

Source: EPA, Region 7 Telephone: 913-551-7365 Last EDR Contact: 07/08/2021

Next Scheduled EDR Contact: 07/20/2009

Data Release Frequency: Varies

Lists of state and tribal brownfield sites

BROWNFIELDS: Municipal Brownfields Redevelopment Grant Program Project Descriptions

The Illinois Municipal Brownfields Redevelopment Grant Program (MBRGP) offers grants worth a maximum of \$240,000 each to municipalities to assist in site investigation activities, development of cleanup objectives, and performance of cleanup activities. Brownfields are abandoned or underused industrial and/or commercial properties that are contaminated (or thought to be contaminated) and have an active potential for redevelopment.

Date of Government Version: 02/11/2010 Date Data Arrived at EDR: 07/31/2014 Date Made Active in Reports: 09/08/2014

Number of Days to Update: 39

Source: Illinois Environmental Protection Agency

Telephone: 217-785-3486 Last EDR Contact: 10/19/2023

Next Scheduled EDR Contact: 01/29/2024

Data Release Frequency: Varies

BROWNFIELDS: Redevelopment Assessment Database

The Office of Site Evaluations Redevelopment Assessment database identifies the status of all properties within the State in which the Illinois EPA's Office of Site Evaluation has conducted a municipal Brownfield Redevelopment Assessment.

Date of Government Version: 07/17/2023 Date Data Arrived at EDR: 07/18/2023 Date Made Active in Reports: 10/03/2023

Number of Days to Update: 77

Source: Illinois Environmental Protection Agency

Telephone: 217-524-1658 Last EDR Contact: 10/17/2023

Next Scheduled EDR Contact: 01/29/2024

Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 08/15/2023 Date Data Arrived at EDR: 08/30/2023 Date Made Active in Reports: 12/01/2023

Number of Days to Update: 93

Source: Environmental Protection Agency

Telephone: 202-566-2777 Last EDR Contact: 12/14/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998 Date Data Arrived at EDR: 12/03/2007 Date Made Active in Reports: 01/24/2008

Number of Days to Update: 52

Source: Environmental Protection Agency

Telephone: 703-308-8245 Last EDR Contact: 10/23/2023

Next Scheduled EDR Contact: 02/05/2024 Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009 Date Data Arrived at EDR: 05/07/2009 Date Made Active in Reports: 09/21/2009

Number of Days to Update: 137

Source: EPA, Region 9 Telephone: 415-947-4219 Last EDR Contact: 10/10/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985 Date Data Arrived at EDR: 08/09/2004 Date Made Active in Reports: 09/17/2004

Number of Days to Update: 39

Source: Environmental Protection Agency

Telephone: 800-424-9346 Last EDR Contact: 06/09/2004 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014 Date Data Arrived at EDR: 08/06/2014 Date Made Active in Reports: 01/29/2015

Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service

Telephone: 301-443-1452 Last EDR Contact: 10/28/2023

Next Scheduled EDR Contact: 02/05/2024 Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 08/21/2023 Date Data Arrived at EDR: 08/21/2023 Date Made Active in Reports: 11/07/2023

Number of Days to Update: 78

Source: Drug Enforcement Administration

Telephone: 202-307-1000 Last EDR Contact: 11/17/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: No Update Planned

CDL: Meth Drug Lab Site Listing

A listing of clandestine/meth drug lab locations.

Date of Government Version: 07/01/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 09/20/2023

Number of Days to Update: 77

Source: Department of Public Health

Telephone: 217-782-5750 Last EDR Contact: 09/27/2023

Next Scheduled EDR Contact: 01/15/2024

Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 08/21/2023 Date Data Arrived at EDR: 08/21/2023 Date Made Active in Reports: 11/07/2023

Number of Days to Update: 78

Source: Drug Enforcement Administration

Telephone: 202-307-1000 Last EDR Contact: 11/17/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Source: Environmental Protection Agency

Telephone: 202-564-6023 Last EDR Contact: 11/01/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/18/2023 Date Data Arrived at EDR: 09/20/2023 Date Made Active in Reports: 11/14/2023

Number of Days to Update: 55

Source: U.S. Department of Transportation

Telephone: 202-366-4555 Last EDR Contact: 12/13/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

IEMA SPILLS: Illinois Emergency Management Agency Spills

A listing of hazardous materials incidents reported to the Illinois Emergency Management Agency.

Date of Government Version: 07/24/2023 Date Data Arrived at EDR: 07/25/2023 Date Made Active in Reports: 10/13/2023

Number of Days to Update: 80

Source: Illinois Emergency Management Agency

Telephone: 217-524-0770 Last EDR Contact: 10/24/2023

Next Scheduled EDR Contact: 02/05/2024 Data Release Frequency: Quarterly

SPILLS: State spills

A listing of incidents reported to the Office of Emergency Response.

Date of Government Version: 07/06/2023 Date Data Arrived at EDR: 07/07/2023 Date Made Active in Reports: 09/20/2023

Number of Days to Update: 75

Source: Illinois EPA Telephone: 217-782-3637 Last EDR Contact: 09/27/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Semi-Annually

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 07/18/2012 Date Data Arrived at EDR: 01/03/2013 Date Made Active in Reports: 03/15/2013

Number of Days to Update: 71

Source: FirstSearch Telephone: N/A

Last EDR Contact: 01/03/2013 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/04/2023 Date Data Arrived at EDR: 12/06/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 6

Source: Environmental Protection Agency

Telephone: 312-886-6186 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 08/07/2023 Date Data Arrived at EDR: 08/15/2023 Date Made Active in Reports: 10/10/2023

Number of Days to Update: 56

Source: U.S. Army Corps of Engineers

Telephone: 202-528-4285 Last EDR Contact: 11/10/2023

Next Scheduled EDR Contact: 02/26/2024

Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021 Date Data Arrived at EDR: 07/13/2021 Date Made Active in Reports: 03/09/2022

Number of Days to Update: 239

Source: USGS

Telephone: 888-275-8747 Last EDR Contact: 10/09/2023

Next Scheduled EDR Contact: 01/22/2024

Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018 Date Data Arrived at EDR: 04/11/2018 Date Made Active in Reports: 11/06/2019 Number of Days to Update: 574 Source: U.S. Geological Survey Telephone: 888-275-8747 Last EDR Contact: 10/04/2023

Next Scheduled EDR Contact: 01/15/2024

Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021 Date Data Arrived at EDR: 02/03/2023 Date Made Active in Reports: 02/10/2023

Number of Days to Update: 7

Source: Environmental Protection Agency

Telephone: 615-532-8599 Last EDR Contact: 11/08/2023

Next Scheduled EDR Contact: 02/19/2024

Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/18/2023 Date Data Arrived at EDR: 09/20/2023 Date Made Active in Reports: 12/12/2023

Number of Days to Update: 83

Source: Environmental Protection Agency

Telephone: 202-566-1917 Last EDR Contact: 12/13/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013 Date Data Arrived at EDR: 03/21/2014 Date Made Active in Reports: 06/17/2014

Number of Days to Update: 88

Source: Environmental Protection Agency

Telephone: 617-520-3000 Last EDR Contact: 10/31/2023

Next Scheduled EDR Contact: 02/12/2024 Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017 Date Data Arrived at EDR: 05/08/2018 Date Made Active in Reports: 07/20/2018

Number of Days to Update: 73

Source: Environmental Protection Agency

Telephone: 703-308-4044 Last EDR Contact: 11/03/2023

Next Scheduled EDR Contact: 02/12/2024 Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site

Date of Government Version: 12/31/2020 Date Data Arrived at EDR: 06/14/2022 Date Made Active in Reports: 03/24/2023

Number of Days to Update: 283

Source: EPA

Telephone: 202-260-5521 Last EDR Contact: 12/14/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2021 Date Data Arrived at EDR: 08/18/2023 Date Made Active in Reports: 11/07/2023

Number of Days to Update: 81

Source: EPA

Telephone: 202-566-0250 Last EDR Contact: 11/13/2023

Next Scheduled EDR Contact: 02/26/2024 Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 07/17/2023 Date Data Arrived at EDR: 07/18/2023 Date Made Active in Reports: 10/10/2023

Number of Days to Update: 84

Source: EPA

Telephone: 202-564-4203 Last EDR Contact: 10/20/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Source: EPA

Telephone: 703-416-0223 Last EDR Contact: 12/04/2023

Next Scheduled EDR Contact: 03/11/2024 Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/09/2023 Date Data Arrived at EDR: 06/29/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 88

Source: Environmental Protection Agency

Telephone: 202-564-8600 Last EDR Contact: 09/26/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995 Date Data Arrived at EDR: 07/03/1995 Date Made Active in Reports: 08/07/1995

Number of Days to Update: 35

Source: EPA

Telephone: 202-564-4104 Last EDR Contact: 06/02/2008

Next Scheduled EDR Contact: 09/01/2008 Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Source: EPA

Telephone: 202-564-6023 Last EDR Contact: 12/04/2023

Next Scheduled EDR Contact: 02/12/2024 Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2023 Date Data Arrived at EDR: 04/04/2023 Date Made Active in Reports: 06/09/2023

Number of Days to Update: 66

Source: EPA

Telephone: 202-566-0500 Last EDR Contact: 10/06/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016 Date Data Arrived at EDR: 11/23/2016 Date Made Active in Reports: 02/10/2017

Number of Days to Update: 79

Source: Environmental Protection Agency

Telephone: 202-564-2501 Last EDR Contact: 09/27/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009 Date Data Arrived at EDR: 04/16/2009 Date Made Active in Reports: 05/11/2009

Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances

Telephone: 202-566-1667 Last EDR Contact: 08/18/2017

Next Scheduled EDR Contact: 12/04/2017 Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009 Date Data Arrived at EDR: 04/16/2009 Date Made Active in Reports: 05/11/2009

Number of Days to Update: 25

Source: EPA Telephone: 202-566-1667 Last EDR Contact: 08/18/2017

Next Scheduled EDR Contact: 12/04/2017 Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/20/2023 Date Data Arrived at EDR: 09/01/2023 Date Made Active in Reports: 09/20/2023

Number of Days to Update: 19

Source: Nuclear Regulatory Commission

Telephone: 301-415-0717 Last EDR Contact: 10/10/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2021 Date Data Arrived at EDR: 04/14/2023 Date Made Active in Reports: 07/10/2023

Number of Days to Update: 87

Source: Department of Energy Telephone: 202-586-8719 Last EDR Contact: 11/27/2023

Next Scheduled EDR Contact: 03/11/2024 Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019

Number of Days to Update: 251

Source: Environmental Protection Agency

Telephone: N/A

Last EDR Contact: 11/27/2023

Next Scheduled EDR Contact: 03/11/2024 Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019 Date Data Arrived at EDR: 11/06/2019 Date Made Active in Reports: 02/10/2020

Number of Days to Update: 96

Source: Environmental Protection Agency

Telephone: 202-566-0517 Last EDR Contact: 11/03/2023

Next Scheduled EDR Contact: 02/12/2024 Data Release Frequency: Varies

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019 Date Data Arrived at EDR: 07/01/2019 Date Made Active in Reports: 09/23/2019

Number of Days to Update: 84

Source: Environmental Protection Agency

Telephone: 202-343-9775 Last EDR Contact: 09/22/2023

Next Scheduled EDR Contact: 01/08/2024 Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007

Number of Days to Update: 40

Source: Environmental Protection Agency

Telephone: 202-564-2501 Last EDR Contact: 12/17/2007

Next Scheduled EDR Contact: 03/17/2008 Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006 Date Data Arrived at EDR: 03/01/2007 Date Made Active in Reports: 04/10/2007

Number of Days to Update: 40

Source: Environmental Protection Agency

Telephone: 202-564-2501 Last EDR Contact: 12/17/2008

Next Scheduled EDR Contact: 03/17/2008 Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020 Date Data Arrived at EDR: 01/28/2020 Date Made Active in Reports: 04/17/2020

Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety

Telephone: 202-366-4595 Last EDR Contact: 10/04/2023

Next Scheduled EDR Contact: 02/05/2024 Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2023 Date Data Arrived at EDR: 07/19/2023 Date Made Active in Reports: 10/10/2023

Number of Days to Update: 83

Source: Department of Justice, Consent Decree Library

Telephone: Varies

Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021 Date Data Arrived at EDR: 03/09/2023 Date Made Active in Reports: 03/20/2023

Number of Days to Update: 11

Source: EPA/NTIS Telephone: 800-424-9346 Last EDR Contact: 12/06/2023

Next Scheduled EDR Contact: 04/01/2024 Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater

than 640 acres.

Date of Government Version: 12/31/2014 Date Data Arrived at EDR: 07/14/2015 Date Made Active in Reports: 01/10/2017

Number of Days to Update: 546

Source: USGS

Telephone: 202-208-3710 Last EDR Contact: 10/02/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023 Date Data Arrived at EDR: 03/03/2023 Date Made Active in Reports: 06/09/2023

Number of Days to Update: 98

Source: Department of Energy Telephone: 202-586-3559 Last EDR Contact: 10/25/2023

Next Scheduled EDR Contact: 02/12/2024

Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019 Date Data Arrived at EDR: 11/15/2019 Date Made Active in Reports: 01/28/2020

Number of Days to Update: 74

Source: Department of Energy Telephone: 505-845-0011 Last EDR Contact: 11/09/2023

Next Scheduled EDR Contact: 02/26/2024

Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 09/19/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 16

Source: Environmental Protection Agency

Telephone: 703-603-8787 Last EDR Contact: 12/04/2023

Next Scheduled EDR Contact: 01/08/2024

Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001 Date Data Arrived at EDR: 10/27/2010 Date Made Active in Reports: 12/02/2010

Number of Days to Update: 36

Source: American Journal of Public Health

Telephone: 703-305-6451 Last EDR Contact: 12/02/2009 Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Telephone: 202-564-2496

Last EDR Contact: 09/26/2017

Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

Date of Government Version: 10/12/2016 Date Data Arrived at EDR: 10/26/2016 Date Made Active in Reports: 02/03/2017

Number of Days to Update: 100

US AIRS MINOR: Air Facility System Data A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017

Number of Days to Update: 100

Source: EPA

Source: EPA

Telephone: 202-564-2496 Last EDR Contact: 09/26/2017

Next Scheduled EDR Contact: 01/08/2018 Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2023 Date Data Arrived at EDR: 08/22/2023 Date Made Active in Reports: 11/07/2023

Number of Days to Update: 77

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959 Last EDR Contact: 11/17/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 82

Source: DOL, Mine Safety & Health Admi

Telephone: 202-693-9424 Last EDR Contact: 10/04/2023

Next Scheduled EDR Contact: 02/19/2024 Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/07/2022 Date Data Arrived at EDR: 02/24/2023 Date Made Active in Reports: 05/17/2023

Number of Days to Update: 82

Source: USGS

Telephone: 703-648-7709 Last EDR Contact: 11/20/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011 Date Data Arrived at EDR: 06/08/2011 Date Made Active in Reports: 09/13/2011

Number of Days to Update: 97

Source: USGS

Telephone: 703-648-7709 Last EDR Contact: 11/20/2023

Next Scheduled EDR Contact: 03/04/2024

Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 11/28/2023 Date Data Arrived at EDR: 11/29/2023 Date Made Active in Reports: 12/11/2023

Number of Days to Update: 12

Source: Department of Interior Telephone: 202-208-2609 Last EDR Contact: 11/28/2023

Next Scheduled EDR Contact: 03/18/2024 Data Release Frequency: Quarterly

MINES MRDS: Mineral Resources Data System

Mineral Resources Data System

Date of Government Version: 08/23/2022 Date Data Arrived at EDR: 11/22/2022 Date Made Active in Reports: 02/28/2023

Number of Days to Update: 98

Source: USGS

Telephone: 703-648-6533 Last EDR Contact: 11/20/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/03/2023 Date Data Arrived at EDR: 11/08/2023 Date Made Active in Reports: 11/20/2023

Number of Days to Update: 12

Source: EPA

Telephone: (312) 353-2000 Last EDR Contact: 11/08/2023

Next Scheduled EDR Contact: 03/11/2024 Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021 Date Data Arrived at EDR: 05/21/2021 Date Made Active in Reports: 08/11/2021

Number of Days to Update: 82

Source: Environmental Protection Agency

Telephone: 202-564-0527 Last EDR Contact: 11/15/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 06/24/2023 Date Data Arrived at EDR: 06/29/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 88

Source: Environmental Protection Agency

Telephone: 202-564-2280 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/06/2023 Date Data Arrived at EDR: 09/13/2023 Date Made Active in Reports: 12/11/2023

Number of Days to Update: 89

Source: Department of Defense Telephone: 703-704-1564 Last EDR Contact: 09/13/2023

Next Scheduled EDR Contact: 01/22/2024 Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels

Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/14/2023 Date Data Arrived at EDR: 08/15/2023 Date Made Active in Reports: 10/19/2023

Number of Days to Update: 65

Source: EPA

Telephone: 800-385-6164 Last EDR Contact: 11/10/2023

Next Scheduled EDR Contact: 02/26/2024 Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 10/02/2023

Number of Days to Update: 89

Source: Environmental Protection Agency

Telephone: 703-603-8895 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 10/02/2023

Number of Days to Update: 89

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 10/02/2023

Number of Days to Update: 89

Source: Environmental Protection Agency

Telephone: 202-566-0250 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 10/02/2023

Number of Days to Update: 89

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 10/02/2023

Number of Days to Update: 89

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020 Date Data Arrived at EDR: 03/17/2021 Date Made Active in Reports: 11/08/2022

Number of Days to Update: 601

Source: Department of Health & Human Services

Telephone: 202-741-5770 Last EDR Contact: 10/23/2023

Next Scheduled EDR Contact: 02/05/2024

Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 09/23/2023 Date Data Arrived at EDR: 10/03/2023 Date Made Active in Reports: 10/10/2023

Number of Days to Update: 7

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 10/02/2023

Number of Days to Update: 89

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 82

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024

Data Release Frequency: Varies

PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 82

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 82

Source: Environmental Protection Agency

Telephone: 202-272-0167 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/06/2023 Date Made Active in Reports: 09/25/2023

Number of Days to Update: 81

Source: Environmental Protection Agency

Telephone: 202-267-2675 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011 Date Data Arrived at EDR: 08/05/2011 Date Made Active in Reports: 09/29/2011

Number of Days to Update: 55

Source: EPA, Office of Water Telephone: 202-564-2496 Last EDR Contact: 09/28/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: No Update Planned

PCS ENF: Enforcement data

No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015

Number of Days to Update: 29

Source: EPA

Telephone: 202-564-2497 Last EDR Contact: 09/28/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Varies

BIOSOLIDS: ICIS-NPDES Biosolids Facility Data

The data reflects compliance information about facilities in the biosolids program.

Date of Government Version: 07/16/2023 Date Data Arrived at EDR: 07/18/2023 Date Made Active in Reports: 08/28/2023

Number of Days to Update: 41

Source: Environmental Protection Agency

Telephone: 202-564-4700 Last EDR Contact: 10/03/2023

Next Scheduled EDR Contact: 01/29/2024 Data Release Frequency: Varies

PFAS: PFAS Sampling Listing

The Illinois Environmental Protection Agency (Illinois EPA) has conducted statewide investigations into the prevalence and occurrence of Per- and Polyfluoroalkyl Substances (PFAS) contamination.

Date of Government Version: 06/28/2023 Date Data Arrived at EDR: 07/07/2023 Date Made Active in Reports: 07/20/2023

Number of Days to Update: 13

Source: Illinois Environmental Protection Agency

Telephone: 217-524-3038 Last EDR Contact: 12/05/2023

Next Scheduled EDR Contact: 03/25/2024

Data Release Frequency: Varies

AIRS: Air Inventory Listing

A listing of air permits and emissions information.

Date of Government Version: 07/05/2023 Date Data Arrived at EDR: 07/06/2023 Date Made Active in Reports: 09/20/2023

Number of Days to Update: 76

Source: Illinois EPA Telephone: 217-557-0314 Last EDR Contact: 09/21/2023

Next Scheduled EDR Contact: 01/08/2024

Data Release Frequency: Varies

ASBESTOS: Asbestos Notification Tracker Information

A listing of asbestos abatement & demolition project site locations in the state.

Date of Government Version: 06/16/2023 Date Data Arrived at EDR: 07/05/2023 Date Made Active in Reports: 09/20/2023

Number of Days to Update: 77

Source: Illinois EPA Telephone: 217-558-5101 Last EDR Contact: 09/21/2023

Next Scheduled EDR Contact: 01/08/2024

Data Release Frequency: Varies

BOL: Bureau of Land Inventory Database

Bureau of Land inventory for facility information. Data results are cross-linked with all on-line database system applications from IEPA - Bureau of Land as well as USEPA FRS database.

Date of Government Version: 12/02/2021 Date Data Arrived at EDR: 12/14/2021 Date Made Active in Reports: 03/01/2022

Number of Days to Update: 77

Source: Illinois Environmental Protection Agency

Telephone: 217-785-9407 Last EDR Contact: 11/15/2023

Next Scheduled EDR Contact: 03/04/2024

Data Release Frequency: Varies

COAL ASH: Coal Ash Site Listing
A listing of coal ash site Icoations.

Date of Government Version: 10/01/2011 Date Data Arrived at EDR: 03/09/2012 Date Made Active in Reports: 04/10/2012

Number of Days to Update: 32

Source: Illinois EPA Telephone: 217-782-1654 Last EDR Contact: 11/15/2023

Next Scheduled EDR Contact: 03/04/2024 Data Release Frequency: Annually

DRYCLEANERS: Illinois Licensed Drycleaners

Any retail drycleaning facility in Illinois must apply for a license through the Illinois Drycleaner Environmental Response Trust Fund. Drycleaner Environmental Response Trust Fund of Illinois.

Date of Government Version: 08/03/2023 Date Data Arrived at EDR: 08/15/2023 Date Made Active in Reports: 10/31/2023

Number of Days to Update: 77

Source: Drycleaner Environmental Response Trust Fund of Illinois

Telephone: 800-765-4041 Last EDR Contact: 11/10/2023

Next Scheduled EDR Contact: 02/26/2024 Data Release Frequency: Varies

Financial Assurance: Financial Assurance Information Listing

Information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

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Date of Government Version: 08/22/2023 Date Data Arrived at EDR: 08/24/2023 Date Made Active in Reports: 09/20/2023

Number of Days to Update: 27

Source: Illinois Environmental Protection Agency

Telephone: 217-782-9887 Last EDR Contact: 11/08/2023

Next Scheduled EDR Contact: 02/26/2024 Data Release Frequency: No Update Planned

HWAR: Hazard Waste Annual Report

Each year, Illinois hazardous-waste generators tell the Illinois EPA the amounts and kinds of hazardous waste they produced during the previous year. Generators indicate by code the types of wastes produced and the steps they took to manage these wastes. If some or all of these wastes were sent to commercial treatment, storage, and disposal facilities (TSDFs), that information and the identity of each receiving facility also are submitted. Illinois TSDFs likewise report the types and quantities of wastes received from in-state and out-of-state generators; they also report the procedures they used to manage these wastes.

Date of Government Version: 12/31/2019 Date Data Arrived at EDR: 05/11/2021 Date Made Active in Reports: 08/02/2021

Number of Days to Update: 83

Source: Illinois EPA Telephone: 217-524-3300 Last EDR Contact: 09/27/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Annually

IMPDMENT: Surface Impoundment Inventory

Statewide inventory of industrial, municipal, mining, oil & gas, and large agricultural impoundment. This study was conducted by the Illinois EPA to assess potential for contamination of shallow aquifers. This was a one-time study. Although many of the impoundments may no longer be present, the sites may be contaminated.

Date of Government Version: 12/31/1980 Date Data Arrived at EDR: 03/08/2002 Date Made Active in Reports: 06/03/2002

Number of Days to Update: 87

Source: Illinois Waste Management & Research Center

Telephone: 217-333-8940 Last EDR Contact: 05/12/2022

Next Scheduled EDR Contact: 08/22/2022 Data Release Frequency: No Update Planned

NPDES: A Listing of Active Permits

A listing of facilities currently active in the state. The types of permits are public, private, federal and state.

Date of Government Version: 04/16/2014 Date Data Arrived at EDR: 04/18/2014 Date Made Active in Reports: 05/20/2014

Number of Days to Update: 32

Source: Illinois EPA Telephone: 217-782-0610 Last EDR Contact: 09/21/2023

Next Scheduled EDR Contact: 01/08/2024

Data Release Frequency: Varies

PIMW: Potentially Infectious Medical Waste

Potentially Infectious Medical Waste (PIMW) is waste generated in connection with the diagnosis, treatment (i.e., provision of medical services), or immunization of human beings or animals; research pertaining to the provision of medical services; or the provision or testing of biologicals.

Date of Government Version: 09/11/2023 Date Data Arrived at EDR: 09/14/2023 Date Made Active in Reports: 12/04/2023

Number of Days to Update: 81

Source: Illinois EPA Telephone: 217-524-3289 Last EDR Contact: 12/07/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2022 Date Data Arrived at EDR: 05/09/2023 Date Made Active in Reports: 08/02/2023

Number of Days to Update: 85

Source: Illinois Emergency Management Agency Telephone: 217-785-9860

Telephone: 217-785-9860 Last EDR Contact: 11/02/2023

Next Scheduled EDR Contact: 02/19/2024 Data Release Frequency: Annually

UIC: Underground Injection Wells

Injection wells are used for disposal of fluids by "injection" into the subsurface. The construction of injection wells range from very technical designs with twenty-four hour monitoring to simply a hole dug in the ground to control runoff. As a result of this diversity, the UIC Program divides injection wells into five different classes.

Date of Government Version: 01/03/2023 Date Data Arrived at EDR: 09/21/2023 Date Made Active in Reports: 12/11/2023

Number of Days to Update: 81

Source: Illinois EPA Telephone: 217-782-9878 Last EDR Contact: 11/08/2023

Next Scheduled EDR Contact: 02/26/2024 Data Release Frequency: Semi-Annually

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A Source: EDR, Inc.
Date Data Arrived at EDR: N/A Telephone: N/A
Date Made Active in Reports: N/A Last EDR Contact: N/A

Number of Days to Update: N/A Next Scheduled EDR Contact: N/A

Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A Source: EDR, Inc.
Date Data Arrived at EDR: N/A Telephone: N/A
Date Made Active in Reports: N/A Last EDR Contact: N/A

Number of Days to Update: N/A Next Scheduled EDR Contact: N/A Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A Source: EDR, Inc.
Date Data Arrived at EDR: N/A Telephone: N/A
Date Made Active in Reports: N/A Last EDR Contact: N/A

Number of Days to Update: N/A Next Scheduled EDR Contact: N/A Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Natural Resources in Illinois.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Telephone: N/A Last EDR Contact: 06/01/2012 Next Scheduled EDR Contact: N/A

Source: Department of Natural Resources

Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Illinois Environmental Protection Agency in Illinois.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/10/2014
Number of Days to Update: 193

Telephone: N/A Last EDR Contact: 06/01/2012 Next Scheduled EDR Contact: N/A Data Release Frequency: Varies

Source: Illinois Environmental Protection Agency

Source: Illinois Environmental Protection Agency

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Illinois Environmental Protection Agency in Illinois.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Telephone: N/A Last EDR Contact: 06/01/2012 Next Scheduled EDR Contact: N/A Data Release Frequency: Varies

COUNTY RECORDS

COOK COUNTY:

CHICAGO ASBESTOS: CDPH Asbestos and Demolition Notification Listing

Notices of Intent (NOI) for demolition and asbestos abatement per Chapter 11-4 Article XVIII of the Municipal Code (see American Legal Publishing Corporation) submitted to the Department of Environment (DOE) for work started January, 1993 to December 31, 2011 or submitted to the Department of Public Health (CDPH) for work beginning on or after January 1, 2012. On January 1, 2012, the DOE was disbanded and all its inspection, permitting, and enforcement authorities were transferred to the CDPH.

Date of Government Version: 09/06/2023 Date Data Arrived at EDR: 09/12/2023 Date Made Active in Reports: 12/04/2023 Number of Days to Update: 83 Source: Chicago Department of Public Health Telephone: 312-747-9884 Last EDR Contact: 12/11/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Varies

CHICAGO COMPLAINTS: CDPH Environmental Complaints Listing

Environmental complaints received by the Department of Environment (DOE) from January 1993 to December 31, 2011 and by the Department of Public Health (CDPH) since January 1, 2012. On January 1, 2012, the DOE was disbanded and all its inspection, permitting, and enforcement authorities were transferred to the CDPH.

Date of Government Version: 08/23/2023 Date Data Arrived at EDR: 08/31/2023 Date Made Active in Reports: 09/21/2023 Number of Days to Update: 21 Source: Chicago Department of Public Health Telephone: 312-747-9884 Last EDR Contact: 12/11/2023

Next Scheduled EDR Contact: 03/25/2024

Data Release Frequency: Varies

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CHICAGO ENF: CDPH Environmental Enforcement Listing

Municipal and State code violation notices issued by the Department of Environment (DOE) from January, 1993 to December 31, 2012 and by the Department of Public Health (CDPH) Permitting and Inspections unit since January 1, 2012. On January 1, 2012, the DOE was disbanded and all its inspection, permitting, and enforcement authorities were transferred to the CDPH..

Date of Government Version: 09/06/2023 Date Data Arrived at EDR: 09/12/2023 Date Made Active in Reports: 12/04/2023

Number of Days to Update: 83

Source: Chicago Department of Public Health

Telephone: 312-747-9884 Last EDR Contact: 12/11/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Varies

CHICAGO INSPECT: CDPH Environmental Inspections Listing

Inspections conducted by the Department of Environment (DOE) from April, 1997 to December 31, 2011 and by the Department of Public Health (CDPH) since January 1, 2012. On January 1, 2012, the Department of Environment was disbanded and all its inspection, permitting, and enforcement authorities were transferred to the CDPH.

Date of Government Version: 08/23/2023 Date Data Arrived at EDR: 09/12/2023 Date Made Active in Reports: 12/04/2023

Number of Days to Update: 83

Source: Chicago Department of Public Health

Telephone: 312-747-9884 Last EDR Contact: 12/11/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Varies

CHICAGO PERMITS: CDPH Environmental Permits Listing

Permits issued by the Department of Environment (DOE) from January 1993 to December 31, 2011 and by the Department of Public Health (CDPH) since January 1, 2012. This dataset also includes tank permits issued by CDPH on behalf of the Office of the Illinois State Fire Marshall (OSFM). On January 1, 2012, the DOE was disbanded and all its inspection, permitting, and enforcement authorities were transferred to the CDPH.

Date of Government Version: 09/06/2023 Date Data Arrived at EDR: 09/12/2023 Date Made Active in Reports: 12/04/2023

Number of Days to Update: 83

Source: Chicago Department of Public Health

Telephone: 312-747-9884 Last EDR Contact: 12/11/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Varies

CHICAGO TANKS: CDPH Storage Tanks Listing

This dataset contains Aboveground Storage Tank (AST) and Underground Storage Tank (UST) information from the Department of Public Healtha??s (CDPH) Tank Asset Database. The Tank Asset Database contains tank information from CDPH AST and UST permit applications as well as UST records imported from the historic Department of Environment (DOE) database. This dataset also includes AST records from the historic DOE and pre-1992 UST records from the Building Department.

Date of Government Version: 09/06/2023 Date Data Arrived at EDR: 09/12/2023 Date Made Active in Reports: 12/04/2023

Number of Days to Update: 83

Source: Department of Public Health

Telephone: 312-747-2374 Last EDR Contact: 12/11/2023

Next Scheduled EDR Contact: 03/25/2024 Data Release Frequency: Quarterly

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/07/2023 Date Data Arrived at EDR: 08/08/2023 Date Made Active in Reports: 10/24/2023

Number of Days to Update: 77

Source: Department of Energy & Environmental Protection

Telephone: 860-424-3375 Last EDR Contact: 11/07/2023

Next Scheduled EDR Contact: 02/19/2024 Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018 Date Data Arrived at EDR: 04/10/2019 Date Made Active in Reports: 05/16/2019

Number of Days to Update: 36

Source: Department of Environmental Protection

Telephone: N/A

Last EDR Contact: 09/28/2023

Next Scheduled EDR Contact: 01/15/2024 Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

facility.

Date of Government Version: 12/31/2019 Date Data Arrived at EDR: 11/30/2023 Date Made Active in Reports: 12/01/2023

Number of Days to Update: 1

Source: Department of Environmental Conservation

Telephone: 518-402-8651 Last EDR Contact: 11/30/2023

Next Scheduled EDR Contact: 02/05/2024 Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018 Date Data Arrived at EDR: 07/19/2019 Date Made Active in Reports: 09/10/2019

Number of Days to Update: 53

Source: Department of Environmental Protection

Telephone: 717-783-8990 Last EDR Contact: 10/05/2023

Next Scheduled EDR Contact: 01/22/2024 Data Release Frequency: Annually

RI MANIFEST: Manifest information Hazardous waste manifest information

> Date of Government Version: 12/31/2020 Date Data Arrived at EDR: 11/30/2021 Date Made Active in Reports: 02/18/2022

Number of Days to Update: 80

Source: Department of Environmental Management

Telephone: 401-222-2797 Last EDR Contact: 11/09/2022

Next Scheduled EDR Contact: 02/26/2024 Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018 Date Data Arrived at EDR: 06/19/2019 Date Made Active in Reports: 09/03/2019

Number of Days to Update: 76

Source: Department of Natural Resources

Telephone: N/A

Last EDR Contact: 11/29/2023

Next Scheduled EDR Contact: 03/18/2024 Data Release Frequency: Annually

Oil/Gas Pipelines

Source: Endeavor Business Media

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data

Source: Endeavor Business Media

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services,

a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary

and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Homes & Centers Listing

Source: Department of Children & Family Services

Telephone: 312-814-4150

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA

Telephone: 877-336-2627

Date of Government Version: 2003, 2015

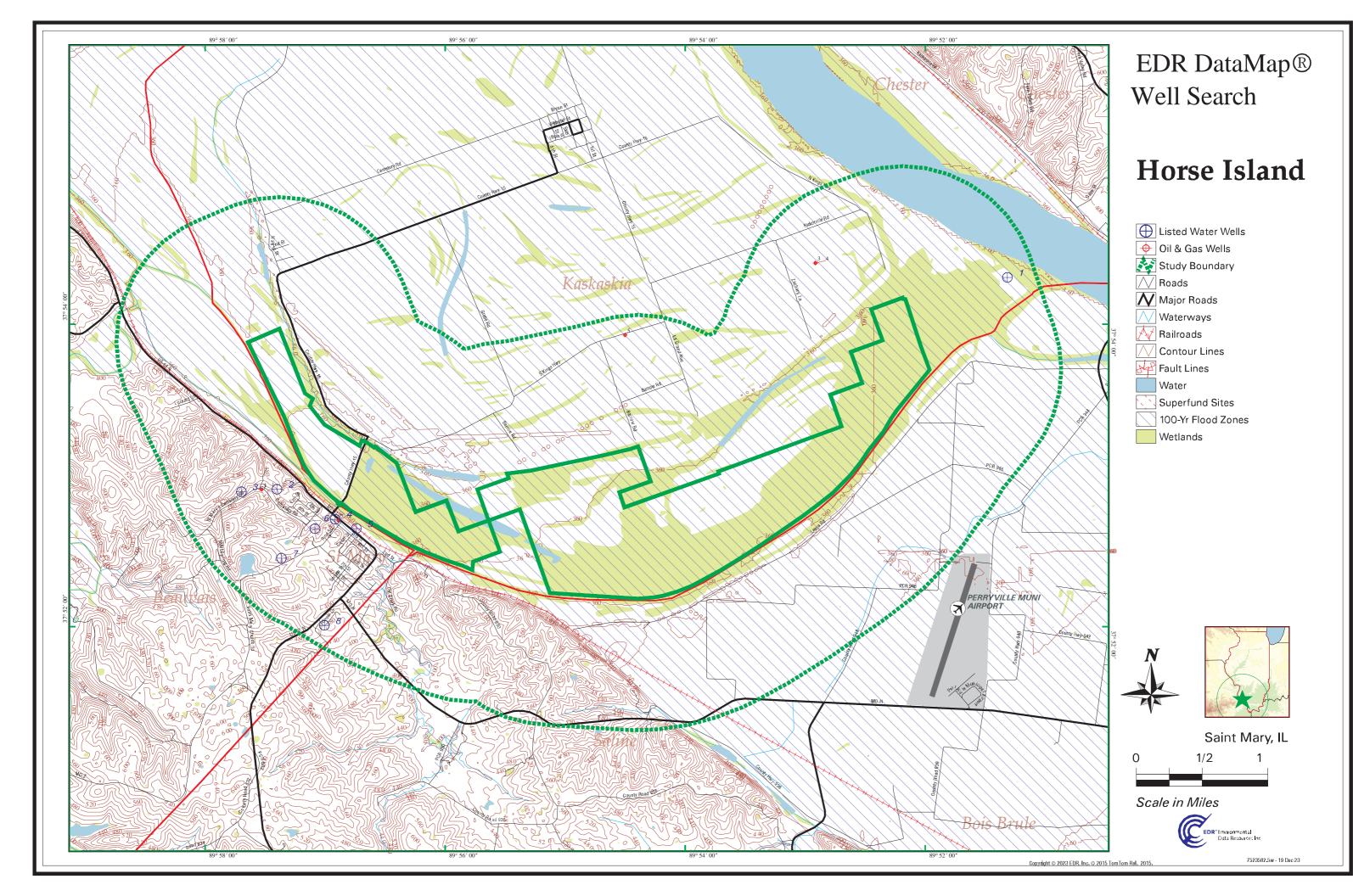
NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory Source: Illinois State Geological Survey

Telephone: 217-333-4747

STREET AND ADDRESS INFORMATION

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Horse Island Saint Mary, IL 63673

Inquiry Number: 7523582.5w

December 19, 2023

EDR DataMap™ Well Search Report



Thank you for your business. Please contact EDR at 1-800-352-0050 with any questions or comments.

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GEOCHECK VERSION 2.1 SUMMARY

FEDERAL DATABASE WELL INFORMATION

MAP	WELL
<u>ID</u>	ID
4	USGS40000691244
8	115G54000691184

STATE WATER WELL INFORMATION

MAP ID	WELL ID
<u> </u>	10
1	ILSG40000282900
1	ILSG40000282899
2	MOLOG3000027797
3	MOLOG3000027794
4	MOLOG3000027771
4	MOLOG3000027770
5	MO700000002624
5	MOLOG3000027763
6	MOLOG3000027754
5	MOLOG3000027748
6	MOLOG3000027746
5	MO700000001081
5	MOLOG3000027736
7	MOLOG3000027715

STATE OIL/GAS WELL INFORMATION

MAP	WELL
<u>ID</u>	<u>ID</u>
1	MOOG70000007081
2	MOOG70000007082
3	ILOG30000139774
4	ILOG30000139773
5	ILOG30000139775

PUBLIC WATER SUPPLY SYSTEM INFORMATION

Map ID: 5

PWS ID: MO4010718 PWS Name: ST MARYS

782 3RD ST

ST. MARYS, MO 63673

PWS currently has or had major violation(s) or enforcement: YES

Map ID: 5

PWS ID: MO4258565

PWS Name: PEACEFUL VALLEY BAPTIST CHURCH

HCR 61 BOX 236

ST. MARYS, MO 63673

PWS currently has or had major violation(s) or enforcement: YES

USGS TOPOGRAPHIC MAP(S)

37089-G7 BELGIQUE, MO IL 37089-G8 LITHIUM, MO IL 37089-H7 CHESTER, IL MO

GEOCHECK VERSION 2.1 SUMMARY

USGS TOPOGRAPHIC MAP(S)

37089-H8 KASKASKIA, MO IL

AREA RADON INFORMATION

Number of sites tested: 1				
Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor Living Area - 2nd Floor Basement	0.600 pCi/L Not Reported Not Reported	100% Not Reported Not Reported	0% Not Reported Not Reported	0% Not Reported Not Reported
Federal Area Radon Infor	mation for Zip Code: (63670		
Number of sites tested: 4				
Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor Living Area - 2nd Floor Basement	0.200 pCi/L Not Reported 2.250 pCi/L	100% Not Reported 75%	0% Not Reported 25%	0% Not Reported 0%
Federal Area Radon Infor	·	63673		
Number of sites tested: 1 Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
		<u>.</u>	<u> </u>	
Living Area - 1st Floor Living Area - 2nd Floor Basement	0.600 pCi/L Not Reported 0.000 pCi/L	100% Not Reported 75%	0% Not Reported 25%	0% Not Reported 0%
Federal Area Radon Infor	mation for Zip Code: (63775		
Number of sites tested: 2				
Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor Living Area - 2nd Floor Basement	0.800 pCi/L Not Reported 7.250 pCi/L	100% Not Reported 50%	0% Not Reported 50%	0% Not Reported 0%
	rmation for Zip Code: (63673		
Federal Area Radon Infor				
Number of sites tested: 1				
	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L

GEOCHECK VERSION 2.1 SUMMARY

AREA RADON INFORMATION

Federal EPA Radon Zone for RANDOLPH County: 2

Note: Zone 1 indoor average level > 4 pCi/L.

: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.

: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RANDOLPH COUNTY, IL

Number of sites tested: 12

Average Activity % <4 pCi/L % 4-20 pCi/L % >20 pCi/L 0%

0.800 pCi/L Living Area - 1st Floor 100% 0%

Living Area - 2nd Floor Not Reported Not Reported Not Reported Not Reported **Basement** 1.883 pCi/L 92% 8% 0%

Federal EPA Radon Zone for STE GENEVIEVE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.

: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.

: Zone 3 indoor average level < 2 pCi/L.

Federal EPA Radon Zone for PERRY County: 2

Note: Zone 1 indoor average level > 4 pCi/L.

: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.

8.233 pCi/L

: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for PERRY COUNTY, MO

Number of sites tested: 3

Basement

Area Average Activity % <4 pCi/L % 4-20 pCi/L % >20 pCi/L 100% 0% Living Area - 1st Floor 0.800 pCi/L 0% Living Area - 2nd Floor Not Reported Not Reported Not Reported Not Reported

67%

33%

0%

Water Well Information:

Map ID: 4

Organization ID: USGS-MO

Organization Name: USGS Missouri Water Science Center

T37N R10E 29DCA1 Monitor Location: Well Type: Description: Not Reported HUC: 07140105 Drainage Area: Not Reported Drainage Area Units: Not Reported Contrib Drainage Area: Not Reported Contrib Drainage Area Unts: Not Reported

Aquifer:

Formation Type: Osagean Series Aquifer Type: Not Reported

Construction Date: 19340801 Well Depth: 505
Well Depth Units: ft Well Hole Depth: 505

Ozark Plateaus aquifer system

Well Hole Depth Units: ft

Ground water levels, Number of Measurements: 1 Level reading date: 1934-08-01 Feet below surface: 18 Feet to sea level: Not Reported

Note: Not Reported

Map ID: 8

Organization ID: USGS-MO

Organization Name: USGS Missouri Water Science Center

Monitor Location: T37N R10E 29DDB1 Well Type: Not Reported HUC: 07140105 Description: Drainage Area: Not Reported Drainage Area Units: Not Reported Contrib Drainage Area: Not Reported Contrib Drainage Area Unts: Not Reported

Aquifer: Mississippi River Valley alluvial aquifer

Formation Type: Holocene Alluvium Aquifer Type: Unconfined single aquifer

Construction Date: 19650714 Well Depth: 53
Well Depth Units: ft Well Hole Depth: 53

Well Hole Depth Units: ft

State Well Information:

Map ID: 1

WELLS SGS:

API#: Database: Water Well Records 121572555200 IL SWSP #: Water Well Status:

Date Drilled: 19821201060000 Farm Name:

Well Name: Driller: Ruester, John T. Elevation: 320 Elevation Reference: Ground level Total Depth: 89 Lithologic Formation: Alluvial Top of Formation (ft): 39 Bottom of Formation (ft): 89

Pump Flow (gpm): 200

URL: https://isgs-oas.isgs.illinois.edu/reports/rwservlet?watersummary&121572555200

Map ID:

WELLS SGS:

Database: Water Well Records API#: 121572555100 IL SWSP #: Status: Water Well

19821030050000 Date Drilled: Farm Name:

Well Name: Ruester, John T. Driller: Elevation: 371 Elevation Reference: Ground level 83 Total Depth: Lithologic Formation: alluvial Top of Formation (ft): 73 Bottom of Formation (ft): 83 Pump Flow (gpm):

URL: https://isgs-oas.isgs.illinois.edu/reports/rwservlet?watersummary&121572555100

Map ID: 2

WELLS LOG:

Geologic Well Log Database Database:

500

ID: 0001593

Owner: Saline Creek M&S Co. #3

Well Type: **Exploratory Hole (Mineral Prospect)** Stratigraphy Log: No

Driller Log: No Other Log: No Samples Retained: No Total Depth (ft): Elevation (ft): 456 442 SWL After Casing Set: Depth to Bedrock (ft): 0 -9999 SWL Before Casing Set: SWL After Casing Grouting (ft): -9999 -9999 SWL Before Casing Grouting (ft): Water Noted by Driller (ft): -9999 Not Reported

Draw Down (ft): -9999 Well Yield (gpm): -9999

(NO SAMPLES or NOT LOGGED) Surface Formation: First Bedrock Form: (SEE LOG, NO STRAT IN LOGMAIN)

Alternate ID 1: None Alternate ID 3: None SDWIS ID: -99999 WIMS ID: None Oil and Gas ID: None Other Database ID: None

Not Reported Mineral Bore Hole ID: None Additional Databases Linked: Not Reported Drill Date: Not Reported Driller: Logger: Not Reported Log Date: Not Reported

Geological Structures: No Interval Core Top (ft):

Interval Core Bottom (ft):

No Formations Identified Remarks:

 $https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/nolog.pdf$ URL:

3 Map ID:

WELLS LOG:

Database: Geologic Well Log Database

ID: 0011943 Owner: Maloney, C.L. Et Al

Well Type: Exploratory Hole (Oil & Gas)

Stratigraphy Log: Driller Log: No Yes Other Log: No Samples Retained: Yes Elevation (ft): 471 Total Depth (ft): 1315 Depth to Bedrock (ft): 55 SWL After Casing Set: -9999 SWL After Casing Grouting (ft): SWL Before Casing Set: -9999 -9999

SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): 641', 1200' (SALT)

Draw Down (ft): -9999 Well Yield (gpm): -9999

Surface Formation: (NO SAMPLES or NOT LOGGED)

 First Bedrock Form:
 CHESTERIAN SERIES UNDIFFERENTIATED

 Alternate ID 1:
 None
 Alternate ID 3:
 None

 SDWIS ID:
 -99999
 WIMS ID:
 None

 Oil and Gas ID:
 193-00003
 Other Database ID:
 None

Mineral Bore Hole ID: None Additional Databases Linked: API OIL AND GAS FILE

Drill Date: 195204 Driller:

Logger: Marinkovic / McCracken

Log Date:195207Geological Structures:NoInterval Core Top (ft):0Interval Core Bottom (ft):0

Remarks: Oil & Gas Test

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0011943.pdf

Map ID: 4

WELLS LOG:

Database: Geologic Well Log Database

ID: 0023591

Owner: City Of St. Marys Test Well #4

Well Type: Test Well - Water

Stratigraphy Log: Yes Driller Log: No Other Log: No Samples Retained: Yes Elevation (ft): Total Depth (ft): 380 53 SWL After Casing Set: -9999 Depth to Bedrock (ft): 0 SWL After Casing Grouting (ft): SWL Before Casing Set: -9999 -9999 SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported Draw Down (ft): -9999 Well Yield (gpm): -9999

Surface Formation: HOLOCENE ALLUVIUM

First Bedrock Form: (NO BEDROCK IDENTIFIED)

 Alternate ID 1:
 None
 Alternate ID 3:
 None

 SDWIS ID:
 -99999
 WIMS ID:
 None

 Oil and Gas ID:
 None
 Other Database ID:
 None

Mineral Bore Hole ID: None

Additional Databases Linked: PUBLIC DRINKING WATER

Drill Date: 19650714

Driller: Havestick Well & Equipment

Logger: Wells, J. Log Date: 19650722

Geological Structures: No Interval Core Top (ft): 0

Interval Core Bottom (ft): 0

Remarks: Not Reported

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0023591.pdf

Map ID: 4

WELLS LOG:

Database: Geologic Well Log Database

Braun & Wise

ID: 0001870

Owner: Schaff Milling Co Well #1

Well Type: Unknown Well Stratigraphy Log: Yes Driller Log: No Other Log: No Samples Retained: Yes Elevation (ft): 389 Total Depth (ft): 1930 Depth to Bedrock (ft): 0 SWL After Casing Set: -9999 SWL Before Casing Set: -9999 SWL After Casing Grouting (ft): -9999 SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported Draw Down (ft): -9999

Well Yield (gpm): -9999 (NO SAMPLES or NOT LOGGED) Surface Formation: First Bedrock Form: **BURLINGTON LIMESTONE**

Alternate ID 1: None Alternate ID 3: None SDWIS ID: -99999 WIMS ID: None Other Database ID: None Oil and Gas ID: None

Not Reported Mineral Bore Hole ID: None Additional Databases Linked: Drill Date: 191605 Driller: Hahn, J.M. UNKNOWN Log Date: Not Reported Logger:

Geological Structures: Interval Core Top (ft): No

Interval Core Bottom (ft):

St. Marys Mo: No Samples From 0-840 And From 1260-1490 Remarks:

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0001870.pdf

Map ID: 5

Missouri Public Drinking Water Wells Database:

DGLS ID: 101182 LOGMAIN ID: 0023427 Well Certification #: Not Reported PWSS Name: St. Mary 4010718 MO4010718 PWSS ID: IPWS ID: Well #: Local Name: Well #2 Well ID: 10956 Facility Type: City Federal Water System Type: Community Status: Plugged

Drill Date: 1965 Abandoned: Plugged: 0 Material Type: Unconsolidated Alluvium

Formation at Casing Depth: Alluvium Formation at Total Depth:

Total Depth: Ground Elevation: 45

Top Seal Type: Not Reported Bottom Seal Type: Not Reported

Casing Depth: Casing Diameter: Casing Type: Steel Casing Elevation: 0 Casing Height: 0 Outer Well Casing Depth: 0 0 Outer Casing Diameter: Screen Length (ft): 0 Depth to Static Water Level: 0 Screen Size (in): 0 Max Yield (gal/min): 0 Dynamic Head of Pump: 0 Drawdown: Year of Pump Test:

Pump Type: Not Reported Pump Manufacturer: Not Reported

Pump Depth: Pump Capacity: 0 Has Pump Meter: Has Stand-by Power: Ν Not Reported VOC detections: Nitrates Detected: Ν Ν Chlorination Used: Filtration Used:

Not Reported Meets Construction Requirements: Not Reported **GWUDISW:**

Not Reported Surface Drainage: Water System Entry Point ID:

SWIP Wellhead Status: Not Verified

Map ID: 5

WELLS LOG:

Database: Geologic Well Log Database

ID: 0023427

Owner: City Of St. Marys Well #2
Well Type: Public Well - Community

Stratigraphy Log: Driller Log: No Samples Retained: Other Log: No Yes Total Depth (ft): Elevation (ft): 364 56 Depth to Bedrock (ft): 56 SWL After Casing Set: -9999 SWL Before Casing Set: -9999 SWL After Casing Grouting (ft): -9999 SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported -9999 Well Yield (gpm): -9999 Draw Down (ft):

Surface Formation: HOLOCENE ALLUVIUM

First Bedrock Form: (NO BEDROCK IDENTIFIED)

Alternate ID 1:NoneAlternate ID 3:NoneSDWIS ID:10956WIMS ID:NoneOil and Gas ID:NoneOther Database ID:None

Mineral Bore Hole ID: None

Additional Databases Linked: PUBLIC DRINKING WATER

Drill Date: 19650416

Driller: Haverstick Well & Equipment

Logger: Wells, J. Log Date: 19650419

Geological Structures: No Interval Core Top (ft): 0

Interval Core Bottom (ft): 0

Remarks: Not Reported

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0023427.pdf

Map ID: 6

WELLS LOG:

Database: Geologic Well Log Database

ID: 0002977

Owner: St. Marys School Well #1
Well Type: Public Well - Community

Stratigraphy Log: Driller Log: No Yes Other Log: No Samples Retained: No Elevation (ft): 388 Total Depth (ft): 505 Depth to Bedrock (ft): SWL After Casing Set: 45 SWL After Casing Grouting (ft): SWL Before Casing Set: -9999 387

SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported Draw Down (ft): -9999 Well Yield (gpm): -9999

Surface Formation: (NO SAMPLES or NOT LOGGED)

First Bedrock Form:

Alternate ID 1:

SDWIS ID:

Oil and Gas ID:

CHESTERIAN SERIES UNDIFFERENTIATED

Alternate ID 3:

None

Alternate ID 3:

None

WIMS ID:

None

Other Database ID:

None

Mineral Bore Hole ID: None Additional Databases Linked: Not Reported Drill Date: Driller: Haverstick, C.W.

Logger: Skillman / Hundhausen

Log Date: 19470806 Geological Structures: No Interval Core Top (ft): 0 Interval Core Bottom (ft): 0

Remarks: Water Has Sulphur Odor

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0002977.pdf

Map ID: 5

WELLS LOG:

Database: Geologic Well Log Database

ID: 0023590

Owner: City Of St. Marys Test Well #3

Well Type: Test Well - Water

Stratigraphy Log: Yes Driller Log: No Other Log: No Samples Retained: Yes Total Depth (ft): Elevation (ft): 380 57 Depth to Bedrock (ft): SWL After Casing Set: 0 -9999 SWL After Casing Grouting (ft): -9999 SWL Before Casing Set: -9999 SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported Draw Down (ft): -9999 Well Yield (gpm): -9999

HOLOCENE ALLUVIUM Surface Formation:

First Bedrock Form: (NO BEDROCK IDENTIFIED)

Alternate ID 3: None Alternate ID 1: None SDWIS ID: -99999 WIMS ID: None Oil and Gas ID: None Other Database ID: None

Mineral Bore Hole ID: None

PUBLIC DRINKING WATER Additional Databases Linked:

Drill Date: 19650622

Driller: Haverstick Well & Equipment

Logger: Wells, J. Log Date: 19650622

Geological Structures: No Interval Core Top (ft): 0

Interval Core Bottom (ft):

Remarks: Not Reported

6

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0023590.pdf

WELLS LOG:

Map ID:

Database: Geologic Well Log Database

ID. DL01591 Owner: Saline Creek M&S Co.

Well Type: Exploratory Hole (Mineral Prospect)

Stratigraphy Log: Driller Log: No Yes Other Log: No Samples Retained: No 398 Total Depth (ft): 418 Elevation (ft): Depth to Bedrock (ft): SWL After Casing Set: -9999 8 SWL Before Casing Set: -9999 SWL After Casing Grouting (ft): -9999 SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported

Well Yield (gpm): Draw Down (ft): -9999

(NO SAMPLES or NOT LOGGED) Surface Formation: First Bedrock Form: (SEE LOG, NO STRAT IN LOGMAIN)

Alternate ID 1: None Alternate ID 3: None SDWIS ID: -99999 WIMS ID: None Oil and Gas ID: Other Database ID: None None

Mineral Bore Hole ID: Additional Databases Linked: Not Reported None Drill Date: Not Reported Driller: Not Reported **DRILLER** Log Date: Not Reported Logger:

Geological Structures: No Interval Core Top (ft):

Interval Core Bottom (ft):

Formations Not Named Remarks:

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/nolog.pdf

Map ID: 5

Database: Missouri Public Drinking Water Wells

DGLS ID: 101721 LOGMAIN ID: Not Reported PWSS Name: Well Certification #: Not Reported St. Mary PWSS ID: 4010718 IPWS ID: MO4010718 Well #: Local Name: Well #3 3 Well ID: 11479 Facility Type: City Federal Water System Type: Community Status: Emergency

Drill Date: 1992 Abandoned:

Plugged: 0 Material Type: Consolidated

Formation at Casing Depth: Meramecian Formation at Total Depth: Osagean Total Depth: Ground Elevation: 400

Top Seal Type: Cement Grout Bottom Seal Type: Cement Grout

Casing Depth: Casing Diameter: 300 Casing Type: Casing Elevation: Steel 0 Casing Height: Outer Well Casing Depth: 0 0 Outer Casing Diameter: 0 Screen Length (ft): -9999 Screen Size (in): -9999 Depth to Static Water Level: 15 Max Yield (gal/min): 30 Dynamic Head of Pump: 500 Year of Pump Test: Drawdown: 471 1993

Pump Type: Submersible Pump Manufacturer: Not Reported

Pump Depth:500Pump Capacity:50Has Pump Meter:Not ReportedHas Stand-by Power:NVOC detections:NNitrates Detected:NChlorination Used:YFiltration Used:Y

GWUDISW: Not Reported Meets Construction Requirements: Not Reported Surface Drainage: Not Reported Water System Entry Point ID: Not Reported

SWIP Wellhead Status: Not Verified

Map ID: 5

WELLS LOG:

Database: Geologic Well Log Database

ID: 0023426

Owner: City Of St. Marys Test Well #1

Well Type: Test Well - Water

Stratigraphy Log: Yes Driller Loa: No Other Log: Samples Retained: No No Elevation (ft): 380 Total Depth (ft): 27 Depth to Bedrock (ft): 25 SWL After Casing Set: -9999 SWL Before Casing Set: -9999 SWL After Casing Grouting (ft): -9999 SWL Before Casing Grouting (ft): -9999 Water Noted by Driller (ft): Not Reported Draw Down (ft): -9999 Well Yield (gpm): -9999

Surface Formation: HOLOCENE ALLUVIUM

First Bedrock Form:

Alternate ID 1:

None

Alternate ID 3:

None

SDWIS ID:

-99999

WIMS ID:

None

Oil and Gas ID:

None

Other Database ID:

None

Mineral Bore Hole ID: None

Additional Databases Linked: PUBLIC DRINKING WATER

Drill Date: 19650416

Driller: Haverstick Well & Equipment

Logger: Wells, J. Log Date: 19650419

Geological Structures: No Interval Core Top (ft): 0

Interval Core Bottom (ft): 0

Remarks: @ E End Of Cedar St, 35' W Of Rr Tracks

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0023426.pdf

Map ID: 7

WELLS LOG:

Database: Geologic Well Log Database

ID: 0019088 Owner: Bartels, Robert

Well Type: Private Well Stratigraphy Log: Yes Driller Log: No Other Log: No Samples Retained: Elevation (ft): Yes 473 Total Depth (ft): 365 Depth to Bedrock (ft): 30

SWL After Casing Set:-9999SWL Before Casing Set:-9999SWL After Casing Grouting (ft):-9999SWL Before Casing Grouting (ft):-9999Water Noted by Driller (ft):Not ReportedDraw Down (ft):-9999Well Yield (gpm):60Surface Formation:LOESS

First Bedrock Form: CHESTERIAN SERIES UNDIFFERENTIATED

Alternate ID 1: None Alternate ID 3: None SDWIS ID: -99999 WIMS ID: None Oil and Gas ID: None Other Database ID: None

Mineral Bore Hole ID: None Additional Databases Linked: Not Reported
Drill Date: 19600616 Driller: Welch Brothers
Logger: Anderson, K.H. Log Date: 196010

Geological Structures: No Interval Core Top (ft):

Interval Core Bottom (ft): 0

Remarks: In W Part Of St Marys

URL: https://info.mo.gov/dnr/DNR_GIS/geology/wrc/logmain/striplogs/0019088.pdf

Map ID: 1

OIL_GAS:

API Number: 193-00003 Operator: MALONEY, CLARENCE

Lease Name:FEEWell Name:Not ReportedWell Type:OilWell Type Date:15-JUL-52Well Status:AbandonedWell Status Date:15-JUL-52Spud Date:Not ReportedElevation (ft):488

Plug Back Depth (ft): Total Depth (ft): 1315 Not Reported Directionally Drilled: Measured Vert Depth (ft): Not Reported Not Reported Not Reported Top Perf Depth (ft): Bottom Perf Depth (ft): Not Reported Cur Permit Issue Date: First Production: Not Reported Not Reported Max Approved PSI: Not Reported SPL Log: 11943

Oil Gravity: Not Reported
Well Status Comments: Not Reported
Well Comments: NO SHOWS

Map ID: 2

OIL_GAS:

API Number: 193-00004 Operator: PERRY COUNTY OIL CO.

Lease Name:WHITELEDGEWell Name:Not ReportedWell Type:OilWell Type Date:01-JAN-07

Well Status: Abandoned, Unknown Location

Well Status Date: 01-JAN-07 Spud Date: Not Reported Elevation (ft): 414 Total Depth (ft): 1600

Plug Back Depth (ft): Not Reported **Directionally Drilled:** Not Reported Not Reported Measured Vert Depth (ft): Top Perf Depth (ft): Not Reported Bottom Perf Depth (ft): Not Reported First Production: Not Reported Cur Permit Issue Date: Not Reported Max Approved PSI: Not Reported

SPL Log: 1871 Oil Gravity: Not Reported Well Status Comments: Not Reported

Well Comments: Not Reported

Map ID: 3

API #: 121570214601 Permit ID: Not Reported

Permit Date: Not Reported Well Status: Dry and Abandoned, No Shows

Max Depth:597Date Completed:19410601050000Formation:Not ReportedCompany Name:Not Reported

Well Name: Carney Sam Well #: 1

Elevation: 365 Elevation Reference: Not Reported Logs: Not Reported ILStrat URL: Not Reported

URL: https://isgs-oas.isgs.illinois.edu/reports/rwservlet?oilsummary&121570214601

Map ID: 4

API#: 121570214600 Permit ID: Not Reported

Permit Date: Not Reported Well Status: Dry and Abandoned, No Shows

Max Depth:597Date Completed:19410617050000Formation:Not ReportedCompany Name:Not Reported

Well Name: Carney Sam Well #: 1

Florestion: Also Florestion Performed: Net Reported

Elevation: 365 Elevation Reference: Not Reported Logs: GT ILStrat URL: Not Reported

URL: https://isgs-oas.isgs.illinois.edu/reports/rwservlet?oilsummary&121570214600

Map ID: 5

API #: 121570214900 Permit ID: 1552

Permit Date: 19451002050000 Well Status: Dry and Abandoned, No Shows, Plugged

Max Depth:1756Date Completed:19460122060000Formation:PlattevilleCompany Name:Osteen, John W.

Well Name: Roth, Francis A. Well #:

Elevation: 365 Elevation Reference: Not Reported

Logs: GT, SSS

ILStrat URL: https://isgs.illinois.edu/ilstrat/index.php/Platteville_Group

URL: https://isgs-oas.isgs.illinois.edu/reports/rwservlet?oilsummary&121570214900

GEOCHECK VERSION 2.1 PUBLIC WATER SUPPLY SYSTEM INFORMATION

PWS SUMMARY:

Map ID: 5

Epa region: 07 State: MO Pwsid: MO4010718 Pwsname: ST MARY Cityserved: Not Reported Stateserved: MO Zipserved: Not Reported Fipscounty: 29186 Status: Active Retpopsrvd: 366

Pwssvcconn: 190 Psource longname: Purch_groundwater **CWS** Owner: Local Govt Pwstype: WYATT, CARL Contact: WYATT, CARL Contactorgname: Contactphone: 573-543-2279 Contactaddress1: 782 3RD ST **PO BOX 107** Contactaddress2: Contactcity: ST MARY 63673-0107 Contactstate: MO Contactzip:

Pwsactivitycode: A

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT

Factype: Treatment_plant Facactivitycode: I

Trtobjective: disinfection Trtprocess: not reported

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT
Factype: Treatment_plant Facactivitycode: I

Trtobjective: iron removal Trtprocess: not reported

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT

Factype: Treatment_plant Facactivitycode: I
Trtobjective: iron removal Trtprocess: permanganate

Tropouros. Introduction Tripocos. permangar

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT
Factype: Treatment_plant Facactivitycode: I

Trtobjective: iron removal Trtprocess: hypochlorination, pre

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT
Factype: Treatment_plant Facactivitycode: I

Trtobjective: iron removal Trtprocess: ph adjustment

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT
Factype: Treatment_plant Facactivitycode: I

Trtobjective: iron removal Trtprocess: sedimentation

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT
Factype: Treatment_plant Facactivitycode: I

Trtobjective: disinfection Trtprocess: hypochlorination, post

Factypecode: TP

adopedade.

Pwsid: MO4010718 Facid: 67163 Facname: ST MARYS - TREATMENT PLANT

Factype: Treatment_plant Facactivitycode: I

Trtobjective: iron removal Trtprocess: filtration, greensand

Factypecode: TP

Pwsid: MO4010718 Facid: 67163

Facname: ST MARYS - TREATMENT PLANT

Factype: Treatment_plant Facactivitycode: I

Trtobjective: softening (hardness removal)

Trtprocess: ion exchange Factypecode: TP

PWS ID: MO4010718 PWS name: ST MARYS Address: 782 3RD ST Care of: Not Reported City: ST. MARYS State: MO 63673 Owner: ST MARYS Zip:

Source code: Ground water Population: 461

PWS ID: MO4010718 PWS type: Not Reported PWS name: Not Reported PWS address: Not Reported PWS city: Not Reported PWS state: Not Reported ST MARYS PWS zip: Not Reported PWS name:

PWS type code: C Retail population served: 366

Contact: WILSON, JAY T Contact address: 782 3RD ST Contact address: PO BOX 107 Contact city: ST MARYS Contact state: MO Contact zip: 63673-0107

Contact telephone: 573-543-2279

County: STE GENEVIEVE Source: Ground water

Treatment Objective: IRON REMOVAL Process: AERATION, SLAT TRAY

Population: 461

County: STE GENEVIEVE Source: Ground water

Treatment Objective: IRON REMOVAL Process: FILTRATION, GREENSAND

Population: 461

County: STE GENEVIEVE Source: Ground water

Treatment Objective: IRON REMOVAL Process: HYPOCHLORINATION, PRE

Population: 461

County: STE GENEVIEVE Source: Ground water
Treatment Objective: IRON REMOVAL Process: PERMANGANATE

Population 464

Population: 461

County: STE GENEVIEVE Source: Ground water
Treatment Objective: IRON REMOVAL Process: SEDIMENTATION

Population: 461

County: STE GENEVIEVE Source: Ground water

Treatment Objective: IRON REMOVAL Process: PH ADJUSTMENT Population: 461

County: STE GENEVIEVE Source: Ground water Treatment Objective: SOFTENING (HARDNESS REMOVAL)

Process: ION EXCHANGE Population: 461

PWS ID: MO4010718 Activity status: Active
Date system activated: 3701 Date system deactivated: Not Reported

Retail population: 00000474 System name: ST MARYS
System address: Not Reported System address: P.O. BOX 107

System city: ST. MARY System state: MO System zip: 63673

County FIPS: Not Reported City served: ST MARYS

Population served: 101 - 500 Persons Treatment: Untreated

Latitude: 375240 Longitude: 0895642

State:MOLatitude degrees:37Latitude minutes:52Latitude seconds:40.0000Longitude degrees:89Longitude minutes:56

Longitude seconds: 42.0000

Cmp edt:

Violation id:1426204Orig code:SState:MOViolation Year:2003

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23
Violation name: Monitoring, Routine Major (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:10/01/2003Cmp edt:10/31/2003

Violation id:1426606Orig code:SState:MOViolation Year:2006

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported

State mcl: Not Reported Cmp bdt: 09/01/2006
Cmp edt: 09/30/2006

Violation id:1426908Orig code:SState:MOViolation Year:2008

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Violation code:22Violation name:MCL, Monthly (**Rule code:110Rule name:TCR

Violation measur:

Not Reported

State mcl:

Not Reported

Cmp bdt:

Violation measure:

Not Reported

O6/01/2008

Violation id:1427209Orig code:SState:MOViolation Year:2008

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:10/01/2008

Cmp edt: 10/31/2008

06/30/2008

Violation id:1427310Orig code:SState:MOViolation Year:2010

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported

Violation measur: Not Reported Unit of measure: Not Reported
State mcl: Not Reported Cmp bdt: 06/01/2010
Cmp edt: 06/30/2010

Violation id:1427315Orig code:SState:MOViolation Year:2010

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:09/01/2010

Cmp edt: 09/30/2010 Violation id: 1427318 Orig code: S Violation Year: 2010 State: MO Contamination code: 3100 Contamination Name: Coliform (TCR) MCL, Monthly (TCR) Violation code: 22 Violation name: Rule code: 110 Rule name: **TCR** Violation measur: Not Reported Unit of measure: Not Reported Not Reported 10/01/2010 State mcl: Cmp bdt: 10/31/2010 Cmp edt: Violation id: 1427320 Orig code: S State: MO Violation Year: 2011 Contamination Name: Contamination code: 3100 Coliform (TCR) 22 MCL, Monthly (TCR) Violation code: Violation name: Rule code: 110 Rule name: **TCR** Not Reported Violation measur: Unit of measure: Not Reported Not Reported 03/01/2011 State mcl: Cmp bdt: 03/31/2011 Cmp edt: Violation id: 1427323 Orig code: S State: MO Violation Year: 2011 Coliform (TCR) Contamination code: 3100 Contamination Name: MCL, Monthly (TCR) Violation code: 22 Violation name: Rule code: 110 Rule name: **TCR** Violation measur: Not Reported Unit of measure: Not Reported Not Reported State mcl: Cmp bdt: 04/01/2011 04/30/2011 Cmp edt: Violation id: 1427327 S Orig code: MO Violation Year: 2011 State: Contamination code: 3100 Contamination Name: Coliform (TCR) MCL, Monthly (TCR) Violation code: 22 Violation name: Rule code: 110 Rule name: **TCR** Violation measur: Not Reported Unit of measure: Not Reported State mcl: Not Reported Cmp bdt: 05/01/2011 05/31/2011 Cmp edt: 1427333 Violation id: Orig code: S State: MO Violation Year: Contamination code: 3100 Contamination Name: Coliform (TCR) Violation name: MCL, Monthly (TCR) Violation code: 22 Rule code: TCR 110 Rule name: Not Reported Not Reported Violation measur: Unit of measure: State mcl: Not Reported Cmp bdt: 10/01/2011 Cmp edt: 10/31/2011 Violation id: 1427334 S Orig code: State: MO Violation Year: 2011 Coliform (TCR) Contamination code: 3100 Contamination Name: MCL, Acute (TCR) Violation code: 21 Violation name: Rule code: 110 Rule name: **TCR** Violation measur: Not Reported Unit of measure: Not Reported Not Reported 10/01/2011 State mcl: Cmp bdt: Cmp edt: 10/31/2011 1427336 S Violation id: Orig code: State: MO Violation Year: 2011 Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code:

Violation measur:

Rule code:

22

110

Not Reported

TCR

Violation name:

Unit of measure:

Rule name:

MCL, Monthly (TCR)

Not Reported

 State mcl:
 Not Reported
 Cmp bdt:
 12/01/2011

 Cmp edt:
 12/31/2011

Violation id:1427338Orig code:SState:MOViolation Year:2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:01/01/2012Cmp edt:01/31/2012

Violation id:1427342Orig code:SState:MOViolation Year:2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code:110Rule name:TCRViolation measur:Not ReportedUnit of measure:Not Reported

State mcl: Not Reported Cmp bdt: 04/01/2012
Cmp edt: 04/30/2012

Violation id: 1427344 Orig code: S

State: MO Violation Year: 2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 24

Violation name: Monitoring, Routine Minor (TCR)

Rule code: 110 Rule name: TCR

Violation measur: Not Reported Unit of measure: Not Reported

 State mcl:
 Not Reported
 Cmp bdt:
 05/01/2012

 Cmp edt:
 05/31/2012

Violation id:1427346Orig code:SState:MOViolation Year:2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported

State mcl: Not Reported Cmp bdt: 08/01/2012
Cmp edt: 08/31/2012

Violation id:1427347Orig code:SState:MOViolation Year:2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Unit of measure: Not Reported

State mcl: Not Reported Cmp bdt: 09/01/2012
Cmp edt: 09/30/2012

Violation id:1427349Orig code:SState:MOViolation Year:2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Violation code:22Violation name:MCL, Monthly (TCR)Rule code:110Rule name:TCR

Violation measur: Not Reported Unit of measure: Not Reported State mcl: Not Reported Cmp bdt: 10/01/2012 Cmp edt: 10/31/2012

Violation id:1427350Orig code:SState:MOViolation Year:2013

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported
State mcl: Cmp bdt: 07/01/2013

 State mcl:
 Not Reported
 Cmp bdt:
 07/01/20

 Cmp edt:
 07/31/2013

Violation id:1427351Orig code:SState:MOViolation Year:2013

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:08/01/2013Cmp edt:08/31/2013

Violation ID: 1122091 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 1122091 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 12/23/2013

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 1425991 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 1425991 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 12/23/2013

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 1426204 Orig Code: S

Enforcement FY: 2004 Enforcement Action: 01/16/2004 Enforcement Detail: St Public Notif received Enforcement Category: Informal

Violation ID: 1426204 Orig Code: S

Enforcement FY: 2004 Enforcement Action: 12/01/2003
Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 1426204 Orig Code: S

Enforcement FY: 2004 Enforcement Action: 12/01/2003

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID:1426204Orig Code:SEnforcemnt FY:2014Enforcement Action:12

Enforcement FY: 2014 Enforcement Action: 12/23/2013 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 1426606 Orig Code: S

Enforcement FY: 2007 Enforcement Action: 11/01/2006

Enforcement Detail: St Public Notif received Enforcement Category: Informal

Violation ID: 1426606 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 12/23/2013
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Emolement Detail. St Compliance achieved Emolement Category. Resolving

Violation ID: 1426606 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 09/25/2006

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 1426606 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 09/25/2006

Enforcement Detail: St Public Notif requested **Enforcement Category:** Informal Violation ID: 1426606 Orig Code: S **Enforcement Action:** 04/30/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1426908 Orig Code: Enforcemnt FY: 2008 **Enforcement Action:** 06/20/2008 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1426908 Orig Code: Enforcemnt FY: 2008 **Enforcement Action:** 06/20/2008 **Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal Orig Code: Violation ID: 1426908 S 04/30/2012 Enforcemnt FY: 2012 **Enforcement Action: Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1426908 Orig Code: S Enforcemnt FY: **Enforcement Action:** 06/30/2008 2008 **Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal 1426908 Violation ID: Orig Code: Enforcemnt FY: 2014 **Enforcement Action:** 12/23/2013 Enforcement Detail: St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427209 Orig Code: Enforcemnt FY: 2009 **Enforcement Action:** 10/28/2008 St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427209 Orig Code: S Enforcemnt FY: Enforcement Action: 12/23/2013 2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427209 Orig Code: S Enforcement Action: 10/28/2008 Enforcemnt FY: 2009 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427209 Orig Code: S 12/03/2008 Enforcemnt FY: **Enforcement Action:** 2009 **Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal Violation ID: 1427209 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427310 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427310 Orig Code: Enforcemnt FY: **Enforcement Action:** 12/31/2010 2011 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427310 Orig Code: Enforcement Action: Enforcemnt FY: 2010 07/15/2010 **Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal Violation ID: 1427310 Orig Code: S

Enforcement Action:

2010

Enforcemnt FY:

Violation ID:

Violation ID:

Violation ID:

Enforcemnt FY:

Enforcemnt FY:

Enforcement Detail:

Enforcement Detail:

Enforcement Category: Enforcement Detail: St Public Notif requested Informal Violation ID: 1427315 Orig Code: 12/31/2010 Enforcemnt FY: 2011 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427315 Orig Code: S 04/30/2012 Enforcemnt FY: **Enforcement Action:** 2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427315 Orig Code: S Enforcemnt FY: 2011 **Enforcement Action:** 11/10/2010 St Public Notif received **Enforcement Category: Enforcement Detail:** Informal 1427315 Violation ID: Orig Code: S 09/28/2010 Enforcemnt FY: 2010 **Enforcement Action:** St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427315 Orig Code: Enforcemnt FY: 2010 **Enforcement Action:** 09/28/2010 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427318 Orig Code: Enforcemnt FY: **Enforcement Action:** 11/03/2010 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427318 Orig Code: S 12/03/2010 Enforcemnt FY: 2011 **Enforcement Action: Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal 1427318 Orig Code: S Violation ID: Enforcemnt FY: 2012 Enforcement Action: 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427318 Orig Code: Enforcemnt FY: Enforcement Action: 12/31/2010 2011 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427318 Orig Code: S Enforcement Action: 2011 11/03/2010 Enforcemnt FY: St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427320 Orig Code: Enforcemnt FY: **Enforcement Action:** 08/15/2011 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving

Enforcement FY: 2011 Enforcement Action: 03/30/2011 Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Orig Code:

Orig Code:

Orig Code:

Enforcement Action:

Enforcement Action:

Enforcement Category:

Enforcement Category:

Violation ID: 1427320 Orig Code: S

1427320

1427320

1427320

St BCA signed

St Compliance achieved

2014

S

S

S

03/10/2014

Resolving

04/30/2012

Formal

07/15/2010

Enforcemnt FY: 03/30/2011 2011 **Enforcement Action:**

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 1427320 Orig Code:

08/08/2011 Enforcemnt FY: 2011 **Enforcement Action: Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal

Violation ID: 1427323 Orig Code:

Enforcement Action: Enforcemnt FY: 2011 08/15/2011 St Compliance achieved **Enforcement Category: Enforcement Detail:** Resolving

Violation ID: 1427323 Orig Code:

Enforcement Action: 03/10/2014 Enforcemnt FY: 2014 **Enforcement Detail:** St Compliance achieved Enforcement Category: Resolving

Violation ID: 1427323 Orig Code:

Enforcemnt FY: 2011 **Enforcement Action:** 04/29/2011

St Violation/Reminder Notice **Enforcement Detail:**

Enforcement Category: Informal

Violation ID: 1427323 Orig Code:

Enforcement Action: 08/08/2011 Enforcemnt FY: 2011 **Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal

Violation ID: 1427323 Orig Code:

04/30/2012 Enforcemnt FY: 2012 **Enforcement Action:**

Enforcement Detail: St BCA signed **Enforcement Category:** Formal

Violation ID: 1427323 Orig Code:

Enforcemnt FY: **Enforcement Action:** 04/29/2011 2011

Enforcement Detail: St Public Notif requested **Enforcement Category:** Informal

Violation ID: 1427327 Orig Code: S

Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal

Violation ID: 1427327 Orig Code:

Enforcemnt FY: 2011 **Enforcement Action:** 06/02/2011

St Violation/Reminder Notice **Enforcement Detail:**

Enforcement Category: Informal

Violation ID: 1427327 Orig Code:

08/15/2011 Enforcemnt FY: 2011 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving

Violation ID: 1427327 Orig Code:

Enforcemnt FY: 2011 **Enforcement Action:** 08/08/2011

St Public Notif received **Enforcement Detail: Enforcement Category:** Informal

Violation ID: 1427327 Orig Code: S

Enforcemnt FY: **Enforcement Action:** 03/10/2014 2014

Enforcement Category: **Enforcement Detail:** St Compliance achieved Resolving

Violation ID: 1427327 Orig Code:

Enforcemnt FY: 06/02/2011 2011 **Enforcement Action: Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal

Violation ID: 1427333 Orig Code:

03/10/2014 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving

Violation ID: 1427333 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 06/30/2012 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427333 Orig Code: Enforcement Action: 04/30/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427333 Orig Code: Enforcement Action: 11/25/2011 Enforcemnt FY: 2012 St Public Notif received **Enforcement Category: Enforcement Detail:** Informal Violation ID: 1427333 Orig Code: Enforcement Action: Enforcemnt FY: 2012 10/21/2011 St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427333 Orig Code: Enforcemnt FY: **Enforcement Action:** 10/21/2011 2012 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427334 Orig Code: Enforcement Action: 06/30/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427334 Orig Code: Enforcement Action: 11/22/2011 Enforcemnt FY: 2012 **Enforcement Detail: Enforcement Category:** St Other Informal 1427334 Violation ID: Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427334 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 10/31/2011 St Public Notif issued **Enforcement Detail: Enforcement Category:** Informal 1427334 Violation ID: Orig Code: 10/28/2011 Enforcemnt FY: 2012 **Enforcement Action: Enforcement Detail:** Informal St Boil Water Order Enforcement Category: Violation ID: 1427334 Orig Code: S Enforcement Action: 11/10/2011 Enforcemnt FY: 2012 **Enforcement Category: Enforcement Detail:** St Public Notif requested Informal Violation ID: 1427334 Orig Code: 11/10/2011 Enforcemnt FY: 2012 **Enforcement Action: Enforcement Detail:** St Formal NOV issued **Enforcement Category:** Informal Violation ID: 1427334 Orig Code: S 03/10/2014 Enforcemnt FY: **Enforcement Action:** 2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427336 Orig Code: S 01/03/2012 Enforcemnt FY: 2012 **Enforcement Action:** St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427336 Orig Code: S 01/03/2012 Enforcemnt FY: 2012 **Enforcement Action:**

St Public Notif requested

Enforcement Detail:

Informal

Enforcement Category:

Violation ID: 1427336 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427336 Orig Code: Enforcement Action: 01/26/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal Violation ID: 1427336 Orig Code: 06/30/2012 Enforcemnt FY: 2012 **Enforcement Action:** St Compliance achieved **Enforcement Category: Enforcement Detail:** Resolving Violation ID: 1427336 Orig Code: S 03/10/2014 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Compliance achieved Enforcement Category: Resolving Violation ID: 1427338 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed Enforcement Category: Formal Violation ID: 1427338 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 01/20/2012 St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427338 Orig Code: Enforcement Action: 01/20/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427338 Oria Code: Enforcemnt FY: 2012 **Enforcement Action:** 02/14/2012 St Public Notif received **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427338 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 06/30/2012 St Compliance achieved **Enforcement Detail: Enforcement Category:** Resolving Violation ID: 1427338 Orig Code: 03/10/2014 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Compliance achieved Enforcement Category: Resolving Violation ID: 1427342 Orig Code: Enforcement Action: 04/20/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427342 Orig Code: S 04/30/2012 Enforcemnt FY: **Enforcement Action:** 2012 **Enforcement Detail: Enforcement Category:** Formal St BCA signed Violation ID: 1427342 Orig Code: S **Enforcement Action:** 04/20/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal Violation ID: 1427342 Orig Code: Enforcemnt FY: 05/18/2012 2012 **Enforcement Action: Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal Violation ID: 1427342 Orig Code: 06/30/2012 Enforcemnt FY: 2012 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving

Violation ID: 1427342 Orig Code: Enforcemnt FY: 2014 **Enforcement Action:** 03/10/2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427344 Orig Code: 10/01/2013 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal Violation ID: 1427344 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 06/21/2012 St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427344 Orig Code: S Enforcemnt FY: 2012 **Enforcement Action:** 04/30/2012 **Enforcement Detail:** St BCA signed **Enforcement Category:** Formal Violation ID: 1427344 Orig Code: Enforcemnt FY: **Enforcement Action:** 12/23/2013 2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427344 Orig Code: 03/10/2014 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427344 Orig Code: 06/21/2012 Enforcemnt FY: 2012 **Enforcement Action: Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427346 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 09/12/2012 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427346 Orig Code: Enforcemnt FY: 2013 **Enforcement Action:** 08/19/2013 St Compliance achieved **Enforcement Detail: Enforcement Category:** Resolving Violation ID: 1427346 Orig Code: 09/12/2012 Enforcemnt FY: 2012 **Enforcement Action: Enforcement Detail: Enforcement Category:** St Formal NOV issued Informal Violation ID: 1427346 Orig Code: 2014 Enforcement Action: 03/10/2014 Enforcemnt FY: **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427346 Orig Code: Enforcemnt FY: **Enforcement Action:** 05/20/2013 2013 **Enforcement Detail: Enforcement Category:** St Compliance achieved Resolving Violation ID: 1427347 Orig Code: S 03/10/2014 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427347 Orig Code: Enforcemnt FY: **Enforcement Action:** 05/20/2013 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427347 Orig Code: Enforcemnt FY: 2012 **Enforcement Action:** 09/18/2012

St Formal NOV issued

1427347

Enforcement Detail:

Violation ID:

Informal

S

Enforcement Category:

Orig Code:

Enforcemnt FY: 2013 **Enforcement Action:** 08/19/2013 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427347 Orig Code: 10/22/2012 Enforcemnt FY: 2013 **Enforcement Action:** St Public Notif received **Enforcement Detail: Enforcement Category:** Informal Violation ID: 1427347 Orig Code: S Enforcement Action: 09/18/2012 Enforcemnt FY: 2012 **Enforcement Detail:** St Public Notif requested Informal **Enforcement Category:** Violation ID: 1427349 Orig Code: S Enforcemnt FY: 2014 **Enforcement Action:** 03/10/2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427349 Orig Code: S 10/25/2012 Enforcemnt FY: 2013 **Enforcement Action: Enforcement Detail:** St Formal NOV issued **Enforcement Category:** Informal Violation ID: 1427349 Orig Code: S Enforcemnt FY: **Enforcement Action:** 11/28/2012 2013 **Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal 1427349 Violation ID: Orig Code: Enforcemnt FY: **Enforcement Action:** 10/25/2012 2013 Enforcement Detail: St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427349 Orig Code: Enforcemnt FY: 2013 **Enforcement Action:** 08/19/2013 St Compliance achieved **Enforcement Detail: Enforcement Category:** Resolving Violation ID: 1427350 Orig Code: S 07/31/2013 Enforcemnt FY: Enforcement Action: 2013 **Enforcement Detail:** St Public Notif received **Enforcement Category:** Informal Violation ID: 1427350 Orig Code: Enforcemnt FY: **Enforcement Action:** 12/23/2013 2014 St Compliance achieved **Enforcement Category: Enforcement Detail:** Resolving Violation ID: 1427350 Orig Code: Enforcemnt FY: 2014 **Enforcement Action:** 03/10/2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 1427350 Orig Code: Enforcemnt FY: **Enforcement Action:** 07/19/2013 **Enforcement Detail:** St Formal NOV issued **Enforcement Category:** Informal Violation ID: 1427350 Orig Code: S 07/19/2013 Enforcemnt FY: **Enforcement Action: Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 1427351 Orig Code: S 03/10/2014 Enforcemnt FY: **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving 1427351 Orig Code: Violation ID: S Enforcement Action: 08/16/2013 Enforcemnt FY: 2013 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal 1427351 Orig Code: Violation ID: S Enforcemnt FY: **Enforcement Action:** 08/16/2013 2013 **Enforcement Detail:** St Formal NOV issued **Enforcement Category:** Informal

Violation ID: 1427351 Orig Code: S

Enforcement FY: 2013 Enforcement Action: 08/28/2013
Enforcement Detail: St Public Notif received Enforcement Category: Informal

Violation ID: 1427351 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 35780 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 12/23/2013 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426204

Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Enforcement date: 1/16/2004 0:00:00 Enforcement action: State Public Notif Received Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426204

Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Enforcement date: 12/1/2003 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426204

Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Enforcement date: 12/1/2003 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426606

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 9/1/2006 0:00:00 Compliance end date: 9/30/2006 0:00:00

Enforcement date: 11/1/2006 0:00:00 Enforcement action: State Public Notif Received

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426606

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 9/1/2006 0:00:00 Compliance end date: 9/30/2006 0:00:00

Enforcement date: 9/25/2006 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426606

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 9/1/2006 0:00:00 Compliance end date: 9/30/2006 0:00:00

Enforcement date: 9/25/2006 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426908

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 6/1/2008 0:00:00 Compliance end date: 6/30/2008 0:00:00

Enforcement date: 6/20/2008 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426908

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 6/1/2008 0:00:00 Compliance end date: 6/30/2008 0:00:00

Enforcement date: 6/20/2008 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1426908

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 6/1/2008 0:00:00 Compliance end date: 6/30/2008 0:00:00

Enforcement date: 6/30/2008 0:00:00 Enforcement action: State Public Notif Received

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1427209

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Enforcement date: 10/28/2008 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1427209

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Enforcement date: 10/28/2008 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: ST MARYS Population served: 366
PWS type code: C Violation ID: 1427209

Contaminant: COLIFORM (TCR)

Violation type: Max Contaminant Level, Monthly (TCR)

Compliance start date: 10/1/2008 0:00:00 Compliance end date: 10/31/2008 0:00:00 Enforcement date: 12/3/2008 0:00:00 Enforcement action: State Public Notif Received

Violation measurement: Not Reported

Map ID: 5

Epa region: 07 State: MO

Pwsid: MO4258565 Pwsname: PEACEFUL VALLEY BAPTIST CAMP Cityserved: Not Reported Stateserved: MO

Zipserved: Not Reported Fipscounty: 29186
Status: Active Retpopsrvd: 120
Pwssvcconn: 5 Psource longname: Groundwater

Pwstype: TNCWS Owner: Private
Contact: OPERLE, DON Contactorgname: OPERLE, DON

Contactphone: 573-543-2714 Contactaddress1: 22199 PEACEFUL VALLEY DR

Contactaddress2: Not Reported Contactcity: ST MARYS

Contactstate: MO Contactzip: 63673-0000

Pwsactivitycode: A

Pwsid: MO4258565 Facid: 69725

Facname: WELL Factype: Treatment_plant Facactivitycode: A Trtobjective: disinfection

Trtprocess: hypochlorination, post Factypecode: TP

PWS ID: MO4258565 PWS type: Not Reported PWS name: Not Reported PWS address: Not Reported PWS city: Not Reported PWS state: Not Reported

PWS zip: Not Reported PWS name: PEACEFUL VALLEY BAPTIST CAMP

PWS type code: NC Retail population served: 120

Contact: OPERLE, DON Contact address: 22199 PEACEFUL VALLEY DR

Contact address: ST MARYS Contact city: MO
Contact state: 63 Contact zip: 573-543-27

Contact state: 63 Contact zip: 573-543-2
Contact telephone: Not Reported

PWS ID: MO4258565 Activity status: Active
Date system activated: 9207 Date system deactivated: Not Reported

Retail population: 00000060 System name: PEACEFUL VALLEY BAPTIST CHURCH

System address: HCR 61 System address: BOX 236
System city: ST. MARYS System state: MO
System zip: 63673

County FIPS: Not Reported City served: PEACEFUL VALLEY

Population served: Under 101 Persons Treatment: Untreated

Latitude: 375236 Longitude: 0895648

 Violation id:
 810301
 Orig code:
 S

 State:
 MO
 Violation Year:
 2001

State: MO Violation Year: 2001
Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23

Violation name: Monitoring, Routine Major (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:08/01/2001Cmp edt:08/31/2001

Violation id:810402Orig code:SState:MOViolation Year:2001

State: MO Violation Year: 2001
Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23
Violation name: Monitoring, Routine

Violation name: Monitoring, Routine Major (TCR)
Rule code: 110

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported

Violation measur: Not Reported Unit of measure: Not Reported
State mcl: Not Reported Cmp bdt: 09/01/2001
Cmp edt: 09/30/2001

Violation id:810703Orig code:SState:MOViolation Year:2003

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23

Violation name: Monitoring, Routine Major (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:06/01/2003

Cmp edt: 06/30/2003

Violation id: 811004 Orig code: S

МО State: Violation Year: 2004 Contamination Name: Coliform (TCR)

Contamination code: 3100 Violation code:

Monitoring, Routine Major (TCR) Violation name:

Rule code: Rule name: **TCR** 110 Violation measur: Not Reported Unit of measure: Not Reported State mcl: Not Reported Cmp bdt: 06/01/2004

Cmp edt: 06/30/2004

S Violation id: 811204 Orig code: State: MO Violation Year: 2004

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23

Monitoring, Routine Major (TCR) Violation name:

TCR Rule name: Rule code: 110 Violation measur: Not Reported Unit of measure: Not Reported State mcl: Not Reported Cmp bdt: 08/01/2004

Cmp edt: 08/31/2004

Violation id: 811405 Orig code: S MO Violation Year: 2005 State:

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23

Violation name: Monitoring, Routine Major (TCR)

Rule name: TCR Rule code:

Violation measur: Not Reported Unit of measure: Not Reported State mcl: Not Reported Cmp bdt: 06/01/2005

06/30/2005 Cmp edt:

811505 S Violation id: Orig code: MO Violation Year: 2005 State:

Contamination code: 3100 Contamination Name: Coliform (TCR)

23 Violation code:

Monitoring, Routine Major (TCR) Violation name:

Rule code: Rule name: **TCR**

Violation measur: Not Reported Unit of measure: Not Reported Not Reported State mcl: Cmp bdt: 08/01/2005 08/31/2005

Cmp edt:

Violation id: 811606 Orig code: S State: MO Violation Year: 2005 Contamination Name: Coliform (TCR)

Contamination code: 3100

Violation code: Monitoring, Routine Major (TCR) Violation name:

Rule name: **TCR** Rule code:

Violation measur: Not Reported Unit of measure: Not Reported Not Reported Cmp bdt: 09/01/2005 State mcl:

09/30/2005 Cmp edt:

Cmp edt:

Violation id: 811706 Orig code: S State: MO Violation Year: 2006

Contamination code: 3100 Violation code: 23

08/31/2006

Monitoring, Routine Major (TCR) Violation name:

Rule code: Rule name: **TCR** 110

Violation measur: Not Reported Unit of measure: Not Reported Not Reported 08/01/2006 State mcl: Cmp bdt:

Contamination Name:

Coliform (TCR)

811807 Violation id: Orig code: S

Violation Year: State: MO 2006 Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code:

Violation name: Monitoring, Routine Major (TCR)

Rule code: Rule name: TCR Not Reported Not Reported Violation measur: Unit of measure: State mcl: Not Reported Cmp bdt: 09/01/2006

09/30/2006 Cmp edt:

S Violation id: 811907 Orig code: 2007 MO Violation Year: State:

Contamination code: 3100 Coliform (TCR) Contamination Name:

Violation code: 23

Violation name: Monitoring, Routine Major (TCR)

Rule code: Rule name: **TCR** Violation measur: Not Reported Unit of measure: Not Reported Not Reported Cmp bdt: 08/01/2007 State mcl:

08/31/2007 Cmp edt:

Violation id: 812008 Orig code: S MO Violation Year: 2007 State:

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code:

Violation name: Monitoring, Routine Major (TCR)

Rule code: 110 Rule name: **TCR**

Unit of measure: Violation measur: Not Reported Not Reported State mcl: Not Reported Cmp bdt: 09/01/2007

Cmp edt: 09/30/2007

S Violation id: 812108 Orig code: State: MO Violation Year: 2006

7500 Contamination Name: **Public Notice** Contamination code:

Violation code: 75

PN Violation for NPDWR Violation Violation name:

PN rule 410 Rule name: Rule code: Violation measur: Not Reported Not Reported Unit of measure: Cmp bdt: 10/27/2006

State mcl: Not Reported Cmp edt: Not Reported

812208 S Violation id: Orig code: State: MO Violation Year: 2006

Public Notice Contamination code: 7500 Contamination Name:

Violation code:

PN Violation for NPDWR Violation Violation name:

410 Rule name: Rule code:

PN rule Not Reported Violation measur: Unit of measure: Not Reported State mcl: Not Reported Cmp bdt: 11/20/2006

Cmp edt: Not Reported

Violation id: 812308 S Orig code: State: MO Violation Year: 2008

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23

Cmp edt:

Monitoring, Routine Major (TCR) Violation name:

Rule code: 110 Rule name: **TCR**

Not Reported Not Reported Violation measur: Unit of measure: State mcl: Not Reported Cmp bdt: 07/01/2008

Violation id: 812612 Orig code: S

State: MO Violation Year: 2010 Coliform (TCR) Contamination code: 3100 Contamination Name:

Violation code: 23

07/31/2008

Violation name: Monitoring, Routine Major (TCR)

Rule code:110Rule name:TCRViolation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:07/01/2010

Cmp edt: 07/31/2010

Violation id:812614Orig code:SState:MOViolation Year:2012

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported
State mcl: Not Reported Cmp bdt: 07/01/2012

State mcl: Not Reported Cmp edt: 07/31/2012

Violation id:812618Orig code:SState:MOViolation Year:2012Contamination code:3014Contamination Name:E. COLI

Violation code: 34 Violation name: Monitoring, Source Water (GWR)

Rule code: 140 Rule name: GWR
Violation measur: Not Reported Unit of measure: Not Reported
State mcl: Not Reported Cmp bdt: 11/01/2012

Cmp edt: Not Reported

Violation id:812621Orig code:SState:MOViolation Year:2013

Contamination code: 3100 Contamination Name: Coliform (TCR)

Violation code: 23

Violation name: Monitoring, Routine Major (TCR)

Rule code: 110 Rule name: TCR
Violation measur: Not Reported Unit of measure: Not Reported
State mcl: Not Reported Cmp bdt: 08/01/2013

Cmp edt: 08/31/2013

Violation id:812622Orig code:SState:MOViolation Year:2013

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code:110Rule name:TCRViolation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:09/01/2013

State mcl: Not Reported Cmp bdt: Cmp edt: 09/30/2013

Violation id:812623Orig code:SState:MOViolation Year:2013

Contamination code: 3100 Contamination Name: Coliform (TCR)
Violation code: 22 Violation name: MCL, Monthly (TCR)

Rule code: 110 Rule name: TCR

Violation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:10/01/2013

Cmp edt: 10/31/2013

Violation id:812628Orig code:SState:MOViolation Year:2013Contamination code:7500Contamination Name:Public Notice

Violation code: 75

Violation name: PN Violation for NPDWR Violation

Rule code:410Rule name:PN ruleViolation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:11/20/2013

Cmp edt: Not Reported

Violation id: 812629 Orig code: S

State: MO Violation Year: 2013
Contamination code: 7500 Contamination Name: Public Notice

Violation code: 75

Violation name: PN Violation for NPDWR Violation

Rule code:410Rule name:PN ruleViolation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:12/04/2013

Cmp edt: Not Reported

Violation id:812630Orig code:SState:MOViolation Year:2013Contamination code:7500Contamination Name:Public Notice

Violation code: 75

Violation name: PN Violation for NPDWR Violation

Rule code:410Rule name:PN ruleViolation measur:Not ReportedUnit of measure:Not ReportedState mcl:Not ReportedCmp bdt:11/21/2013

Cmp edt: Not Reported

Violation ID:199Orig Code:SEnforcemnt FY:2014Enforcement Action:01/2

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 810195 Orig Code: S

Enforcement FY: 2009 Enforcement Action: 12/15/2008
Enforcement Detail: St Public Notif issued Enforcement Category: Informal

Violation ID: 810195 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 810295 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014
Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 810295 Orig Code: S

Enforcement FY: 2009 Enforcement Action: 12/15/2008 Enforcement Detail: St Public Notif issued Enforcement Category: Informal

Violation ID: 810301 Orig Code: S

Enforcemnt FY: 2001 Enforcement Action: 09/24/2001

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 810301 Orig Code: S

Enforcement FY: 2002 Enforcement Action: 11/26/2001 Enforcement Detail: St Public Notif received Enforcement Category: Informal

Violation ID: 810301 Orig Code: S

Enforcement FY: 2001 Enforcement Action: 09/24/2001 Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 810301 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 810402 Orig Code: S

Enforcement FY: 2002 Enforcement Action: 10/23/2001

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 810402 Orig Code: S

10/23/2001 Enforcemnt FY: 2002 **Enforcement Action:** St Public Notif requested **Enforcement Detail: Enforcement Category:** Informal Violation ID: 810402 S Orig Code: 01/22/2014 Enforcemnt FY: 2014 **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 810703 Orig Code: Enforcement Action: 07/30/2003 Enforcemnt FY: 2003 **Enforcement Detail:** St Public Notif requested Informal **Enforcement Category:** Violation ID: 810703 Orig Code: S 07/30/2003 Enforcemnt FY: 2003 **Enforcement Action: Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal 810703 Violation ID: Orig Code: Enforcemnt FY: 2014 **Enforcement Action:** 01/22/2014 **Enforcement Detail:** St Compliance achieved Enforcement Category: Resolving Violation ID: 811004 Orig Code: Enforcemnt FY: 2004 **Enforcement Action:** 07/28/2004 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 811004 Orig Code: Enforcemnt FY: **Enforcement Action:** 07/28/2004 **Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal 811004 Violation ID: Orig Code: S Enforcemnt FY: 2014 **Enforcement Action:** 01/22/2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 811204 Orig Code: 2014 Enforcemnt FY: **Enforcement Action:** 01/22/2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving Violation ID: 811204 Orig Code: 09/30/2004 Enforcemnt FY: 2004 **Enforcement Action: Enforcement Category: Enforcement Detail:** St Public Notif requested Informal Violation ID: 811204 Orig Code: 09/30/2004 Enforcemnt FY: 2004 **Enforcement Action:** St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal 811405 Violation ID: Orig Code: Enforcemnt FY: 2006 **Enforcement Action:** 06/29/2006 St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal 811405 Orig Code: Violation ID: 07/29/2005 Enforcemnt FY: 2005 **Enforcement Action: Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal 811405 Violation ID: Orig Code: Enforcemnt FY: **Enforcement Action:** 07/29/2005 2005 **Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 811405 Orig Code: Enforcemnt FY: 2014 **Enforcement Action:** 01/22/2014

Enforcement Detail: St Compliance achieved **Enforcement Category:** Resolving Violation ID: 811505 Orig Code: S 09/28/2005 Enforcemnt FY: 2005 **Enforcement Action:** St Violation/Reminder Notice **Enforcement Detail: Enforcement Category:** Informal

Violation ID: 811505 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 06/29/2006

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 811505 Orig Code: S

Enforcement FY: 2005 Enforcement Action: 09/28/2005 Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 811505 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Petail: St Compliance achieved Enforcement Category: Pecality Resolving

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 811606 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 06/29/2006
Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID:811606Orig Code:SEnforcemnt FY:2006Enforcement Action:10/27/2005

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 811606 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 10/27/2005
Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 811606 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 811706 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 09/26/2006
Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 811706 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 811706 Orig Code: S

Enforcement FY: 2006 Enforcement Action: 09/26/2006

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 811807 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 811807 Orig Code: S

Enforcement FY: 2007 Enforcement Action: 10/20/2006
Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 811807 Orig Code: S

Enforcement FY: 2007 Enforcement Action: 10/20/2006

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 811907 Orig Code: S

Enforcement FY: 2007 Enforcement Action: 09/27/2007

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 811907 Orig Code: S

Enforcement FY: 2007 Enforcement Action: 09/27/2007 Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 811907 Orig Code: S

Enforcement FY: 2009 Enforcement Action: 12/15/2008 Enforcement Detail: St Public Notif issued Enforcement Category: Informal

Violation ID: 811907 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 812008 Orig Code: S

Enforcement FY: 2008 Enforcement Action: 10/26/2007

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 812008 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 812008 Orig Code: S

Enforcement FY: 2008 Enforcement Action: 10/26/2007

Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 812008 Orig Code: S

Enforcement FY: 2009 Enforcement Action: 12/15/2008 Enforcement Detail: St Public Notif issued Enforcement Category: Informal

Emorement Detail. Of Fubility Notin Issued

Violation ID: 812108 Orig Code: S

Enforcement FY: 2011 Enforcement Action: 12/31/2010 Enforcement Detail: St Intentional no-action Enforcement Category: Resolving

Violation ID: 812208 Orig Code: S

Enforcement FY: 2011 Enforcement Action: 12/31/2010

Enforcement Detail: St Intentional no-action Enforcement Category: Resolving

Violation ID: 812308 Orig Code: S

Enforcement FY: 2009 Enforcement Action: 12/15/2008

Enforcement Detail: St Public Notif issued Enforcement Category: Informal

Violation ID: 812308 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 812308 Orig Code: S

Enforcement FY: 2008 Enforcement Action: 08/27/2008

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 812308 Orig Code: S

Enforcement FY: 2008 Enforcement Action: 08/27/2008
Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 812612 Orig Code: S

2014 01/22/2014 Enforcemnt FY: **Enforcement Action: Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving 812612 Violation ID: Orig Code: 08/27/2010 Enforcemnt FY: 2010 **Enforcement Action: Enforcement Detail:** St Public Notif requested **Enforcement Category:** Informal Violation ID: 812612 Orig Code: S 08/27/2010 Enforcemnt FY: 2010 **Enforcement Action:** Enforcement Detail: St Violation/Reminder Notice **Enforcement Category:** Informal Violation ID: 812614 Orig Code: S Enforcemnt FY: 2012 **Enforcement Action:** 07/13/2012 **Enforcement Detail:** St Violation/Reminder Notice **Enforcement Category:** Informal Violation ID: 812614 Orig Code: Enforcemnt FY: 2014 **Enforcement Action:** 01/22/2014 **Enforcement Detail:** St Compliance achieved **Enforcement Category:** Resolving

Violation ID: 812614 Orig Code: S

Enforcement FY: 2012 Enforcement Action: 07/13/2012

Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 812618 Orig Code: S

Enforcement FY: 2013 Enforcement Action: 11/19/2012

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 812618 Orig Code: S

Enforcement FY: 2013 Enforcement Action: 11/19/2012
Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 812621 Orig Code: S

Enforcement FY: 2013 Enforcement Action: 09/30/2013

Enforcement Detail: St Violation/Reminder Notice

Enforcement Category: Informal

Violation ID: 812621 Orig Code: S

Enforcement FY: 2013 Enforcement Action: 09/30/2013 Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 812621 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 812622 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014

Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 812622 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 10/11/2013

Enforcement Detail: St Public Notif requested Enforcement Category: Informal

Violation ID: 812622 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 10/11/2013
Enforcement Detail: St Formal NOV issued Enforcement Category: Informal

Violation ID: 812623 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 01/22/2014 Enforcement Detail: St Compliance achieved Enforcement Category: Resolving

Violation ID: 812623 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 10/24/2013 Enforcement Detail: St Formal NOV issued Enforcement Category: Informal

Violation ID: 812623 Orig Code: S

Enforcement FY: 2014 Enforcement Action: 10/24/2013 Enforcement Detail: St Public Notif requested Enforcement Category: Informal

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810301 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2001 0:00:00 Compliance end date: 8/31/2001 0:00:00

Enforcement date: 11/26/2001 0:00:00 Enforcement action: State Public Notif Received

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810301 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Enforcement date: 9/24/2001 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810301 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2001 0:00:00 Compliance end date: 8/31/2001 0:00:00

Enforcement date: 9/24/2001 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810402 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Enforcement date: 10/23/2001 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810402 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2001 0:00:00 Compliance end date: 9/30/2001 0:00:00

Enforcement date: 10/23/2001 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810703 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2003 0:00:00 Compliance end date: 6/30/2003 0:00:00

Enforcement date: 7/30/2003 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 810703 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2003 0:00:00 Compliance end date: 6/30/2003 0:00:00

Enforcement date: 7/30/2003 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811004 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2004 0:00:00 Compliance end date: 6/30/2004 0:00:00

Enforcement date: 7/28/2004 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811004 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2004 0:00:00 Compliance end date: 6/30/2004 0:00:00

Enforcement date: 7/28/2004 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811204 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2004 0:00:00 Compliance end date: 8/31/2004 0:00:00

Enforcement date: 9/30/2004 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811204 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2004 0:00:00 Compliance end date: 8/31/2004 0:00:00

Enforcement date: 9/30/2004 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811405 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2005 0:00:00 Compliance end date: 6/30/2005 0:00:00

Enforcement date: 6/29/2006 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811405 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2005 0:00:00 Compliance end date: 6/30/2005 0:00:00

Enforcement date: 7/29/2005 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811405 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 6/1/2005 0:00:00 Compliance end date: 6/30/2005 0:00:00

Enforcement date: 7/29/2005 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811505 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2005 0:00:00 Compliance end date: 8/31/2005 0:00:00

Enforcement date: 6/29/2006 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811505 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2005 0:00:00 Compliance end date: 8/31/2005 0:00:00

Enforcement date: 9/28/2005 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811505 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2005 0:00:00 Compliance end date: 8/31/2005 0:00:00

Enforcement date: 9/28/2005 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811606 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2005 0:00:00 Compliance end date: 9/30/2005 0:00:00

Enforcement date: 10/27/2005 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811606 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2005 0:00:00 Compliance end date: 9/30/2005 0:00:00

Enforcement date: 10/27/2005 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811606 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2005 0:00:00 Compliance end date: 9/30/2005 0:00:00

Enforcement date: 6/29/2006 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 811706 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2006 0:00:00 Compliance end date: 8/31/2006 0:00:00

Enforcement date: 9/26/2006 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PEACEFUL VALLEY BAPTIST CAMP PWS name:

Population served: PWS type code: NC

COLIFORM (TCR) Violation ID: 811706 Contaminant:

Monitoring, Routine Major (TCR) Violation type:

Compliance start date: 8/1/2006 0:00:00 Compliance end date: 8/31/2006 0:00:00

Enforcement date: 9/26/2006 0:00:00 Enforcement action: State Public Notif Requested

Not Reported Violation measurement:

PEACEFUL VALLEY BAPTIST CAMP PWS name:

Population served: 120 PWS type code: NC

Violation ID: 811807 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2006 0:00:00 Compliance end date: 9/30/2006 0:00:00

Enforcement date: 10/20/2006 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PEACEFUL VALLEY BAPTIST CAMP PWS name:

Population served: PWS type code:

Violation ID: 811807 Contaminant: COLIFORM (TCR)

Monitoring, Routine Major (TCR) Violation type:

9/1/2006 0:00:00 9/30/2006 0:00:00 Compliance start date: Compliance end date:

Enforcement date: 10/20/2006 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

COLIFORM (TCR) Violation ID: 811907 Contaminant:

Monitoring, Routine Major (TCR) Violation type:

Compliance start date: 8/1/2007 0:00:00 Compliance end date: 8/31/2007 0:00:00 12/15/2008 0:00:00 Enforcement action: State Public Notif Issued Enforcement date:

Violation measurement: Not Reported

Enforcement date:

PEACEFUL VALLEY BAPTIST CAMP PWS name:

Population served: 120 PWS type code: NC

Violation ID: 811907 COLIFORM (TCR) Contaminant:

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 8/1/2007 0:00:00 Compliance end date: 8/31/2007 0:00:00

State Violation/Reminder Notice Enforcement action:

Not Reported

Violation measurement:

PWS name: PEACEFUL VALLEY BAPTIST CAMP

9/27/2007 0:00:00

Population served: PWS type code:

Violation ID: 811907 Contaminant: COLIFORM (TCR)

Monitoring, Routine Major (TCR) Violation type:

8/1/2007 0:00:00 Compliance start date: Compliance end date: 8/31/2007 0:00:00

Enforcement date: 9/27/2007 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PEACEFUL VALLEY BAPTIST CAMP PWS name:

Population served: PWS type code: 120

Violation ID: 812008 Contaminant: COLIFORM (TCR)

Monitoring, Routine Major (TCR) Violation type:

9/1/2007 0:00:00 9/30/2007 0:00:00 Compliance start date: Compliance end date:

Enforcement date: 10/26/2007 0:00:00

State Violation/Reminder Notice

Enforcement action: Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 812008 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2007 0:00:00 Compliance end date: 9/30/2007 0:00:00

Enforcement date: 10/26/2007 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 812008 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 9/1/2007 0:00:00 Compliance end date: 9/30/2007 0:00:00 Enforcement date: 12/15/2008 0:00:00 Enforcement action: State Public Notif Issued

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC Violation ID: 812108 Contaminant: 7500

Violation type:75Compliance start date:10/27/2006 0:00:00Compliance end date:12/31/2025 0:00:00Enforcement date:No Enf Action as ofEnforcement action:7/8/2009 0:00:00Violation measurement:Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC Violation ID: 812208 Contaminant: 7500

Violation type:75Compliance start date:11/20/2006 0:00:00Compliance end date:12/31/2025 0:00:00Enforcement date:No Enf Action as ofEnforcement action:7/8/2009 0:00:00Violation measurement:Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 812308 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 7/1/2008 0:00:00 Compliance end date: 7/31/2008 0:00:00 Enforcement date: 12/15/2008 0:00:00 Enforcement action: State Public Notif Issued

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 812308 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 7/1/2008 0:00:00 Compliance end date: 7/31/2008 0:00:00

Enforcement date: 8/27/2008 0:00:00

Enforcement action: State Violation/Reminder Notice

Violation measurement: Not Reported

PWS name: PEACEFUL VALLEY BAPTIST CAMP

Population served: 120 PWS type code: NC

Violation ID: 812308 Contaminant: COLIFORM (TCR)

Violation type: Monitoring, Routine Major (TCR)

Compliance start date: 7/1/2008 0:00:00 Compliance end date: 7/31/2008 0:00:00

Enforcement date: 8/27/2008 0:00:00 Enforcement action: State Public Notif Requested

Violation measurement: Not Reported

ILLINOIS GOVERNMENT WELL RECORDS SEARCHED

PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at

least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after

August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

State Wetlands Data: Wetland Inventory Source: Illinois State Geological Survey

Telephone: 217-333-4747

Oil and Gas Wells Listing

Source: Illinois State Geological Survey

Telephone: 217-333-5109

Oil and gas wells location points from the Illinois State Geological Survey database.

Water Well Records

Source: Illinois Geological Survey Telephone: 217-333-4747

Illinois Private Well Database and PICS (Public, Industrial, Commercial Survey)

Source: Illinois State Water Survey

Telephone: 217-333-9043

Water Well Location Information

Source: Illinois Environmental Protection Agency

Telephone: 217-782-0810

STREET AND ADDRESS INFORMATION

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Horse Island

Horse Island Saint Mary, IL 63673

Inquiry Number: 7523582.6

December 21, 2023

The EDR Aerial Photo Decade Package



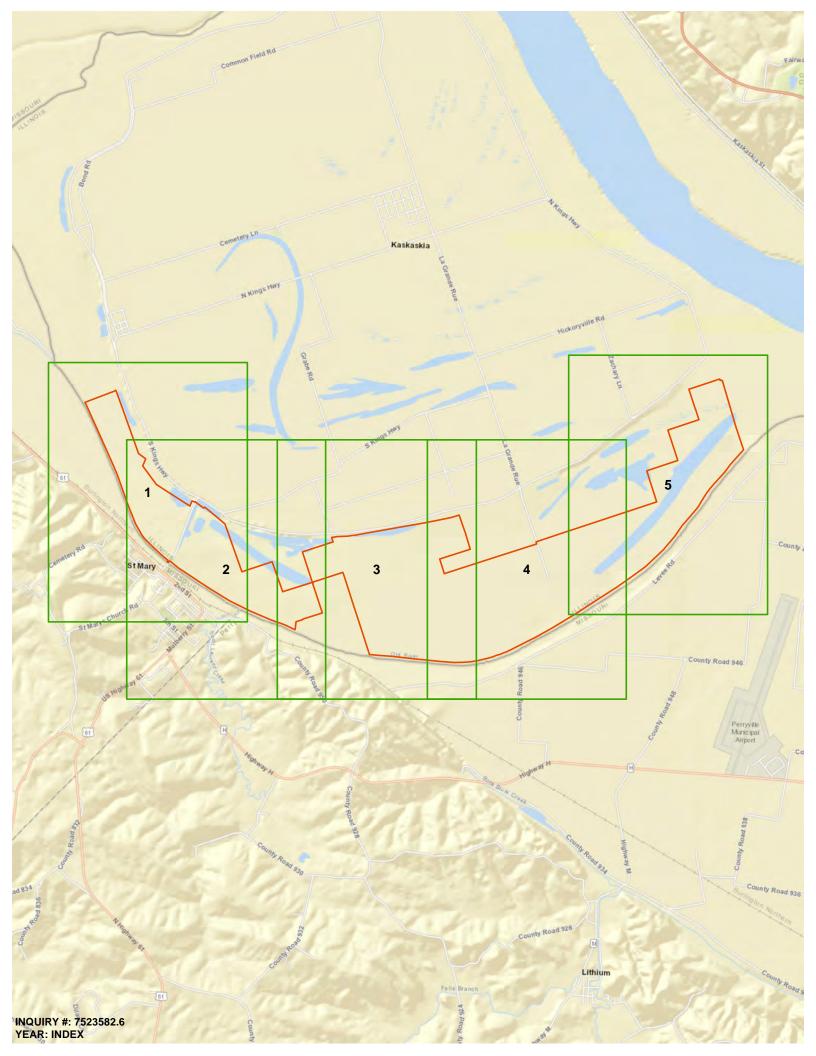
Date EDR Searched Historical Sources:

Aerial Photography December 21, 2023

Target Property: Horse Island

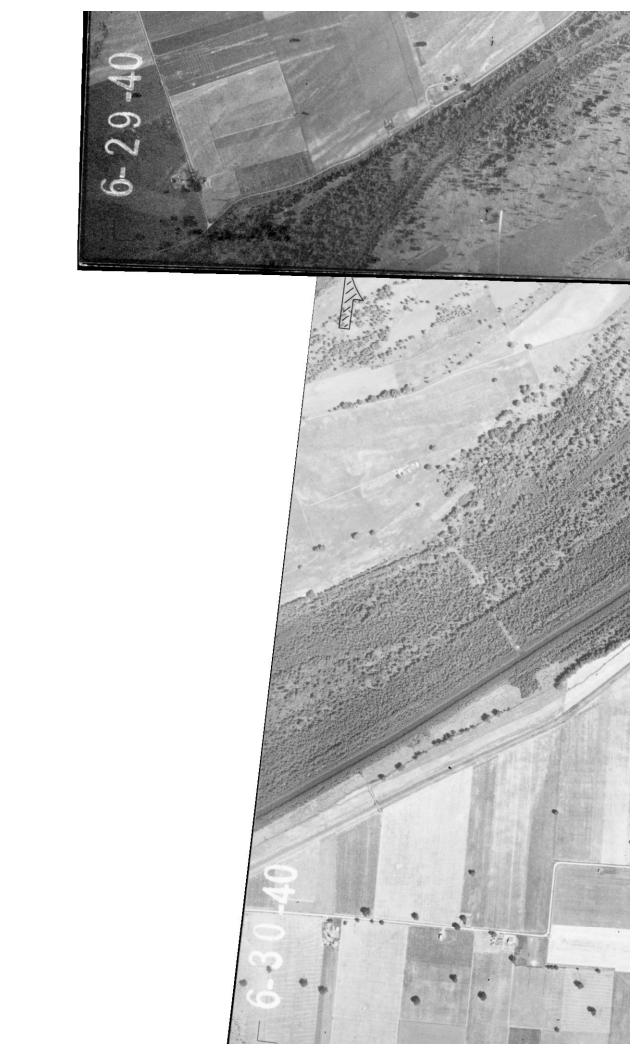
Saint Mary, IL 63673

<u>Year</u> 🛘	<u>Scale</u> []	<u>Details</u> []	<u>Source</u> []
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1956	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1956	USGS
1968	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1968	USGS
1978	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1978	USGS
1981	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1981	USDA
1984	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1984	USDA
1993	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1993	USGS/DOQQ
1998-1999	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1998-1999	USGS/DOQQ
2005	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2005	USGS/DOQQ
2010	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2010	USDA/NAIP
2016	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2016	USDA/NAIP
2020	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2020	USDA/NAIP













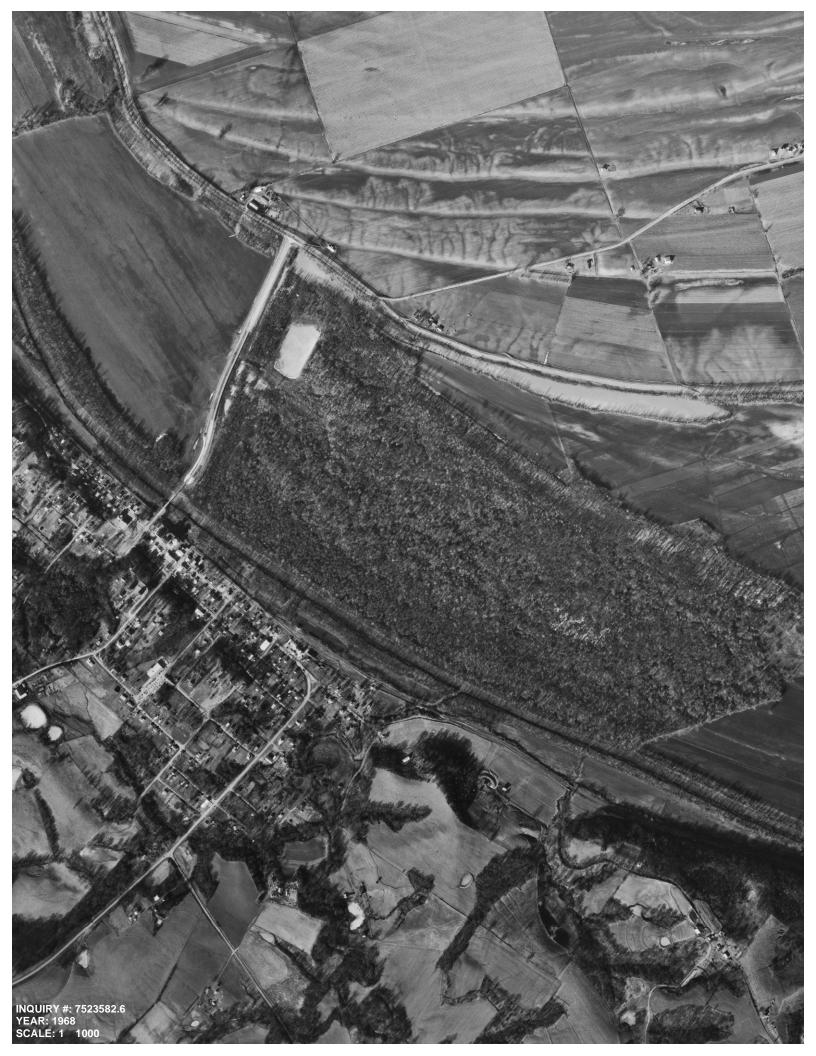












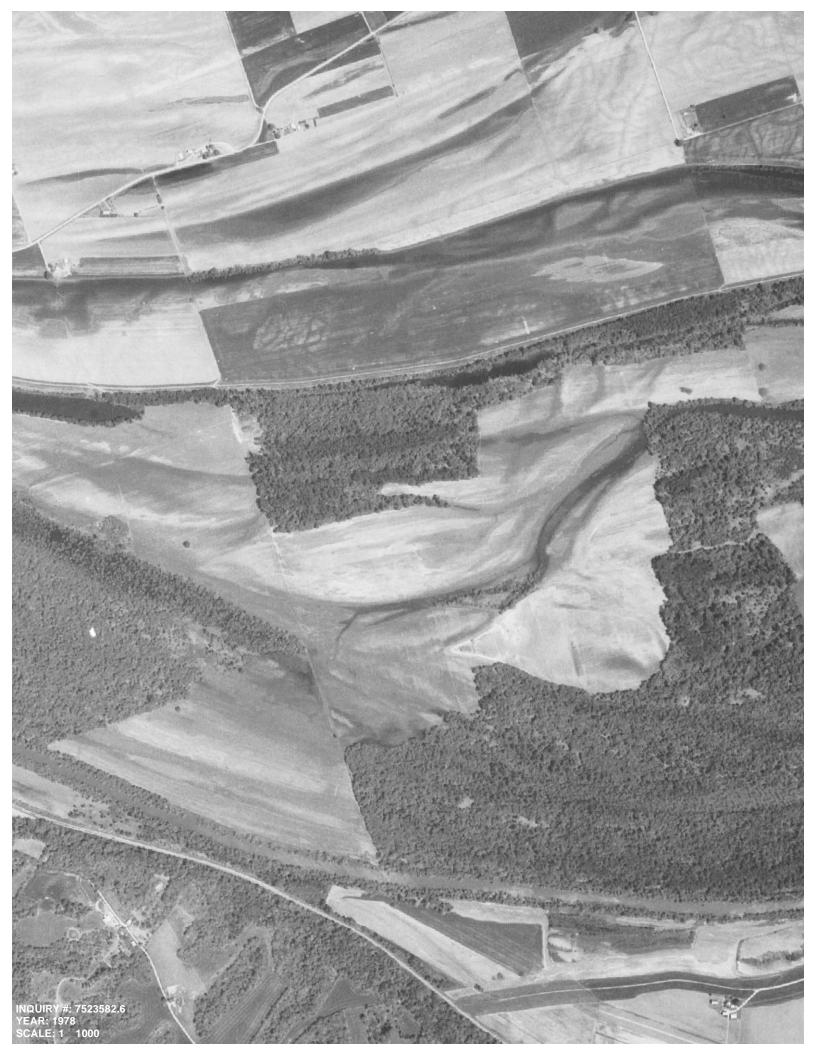






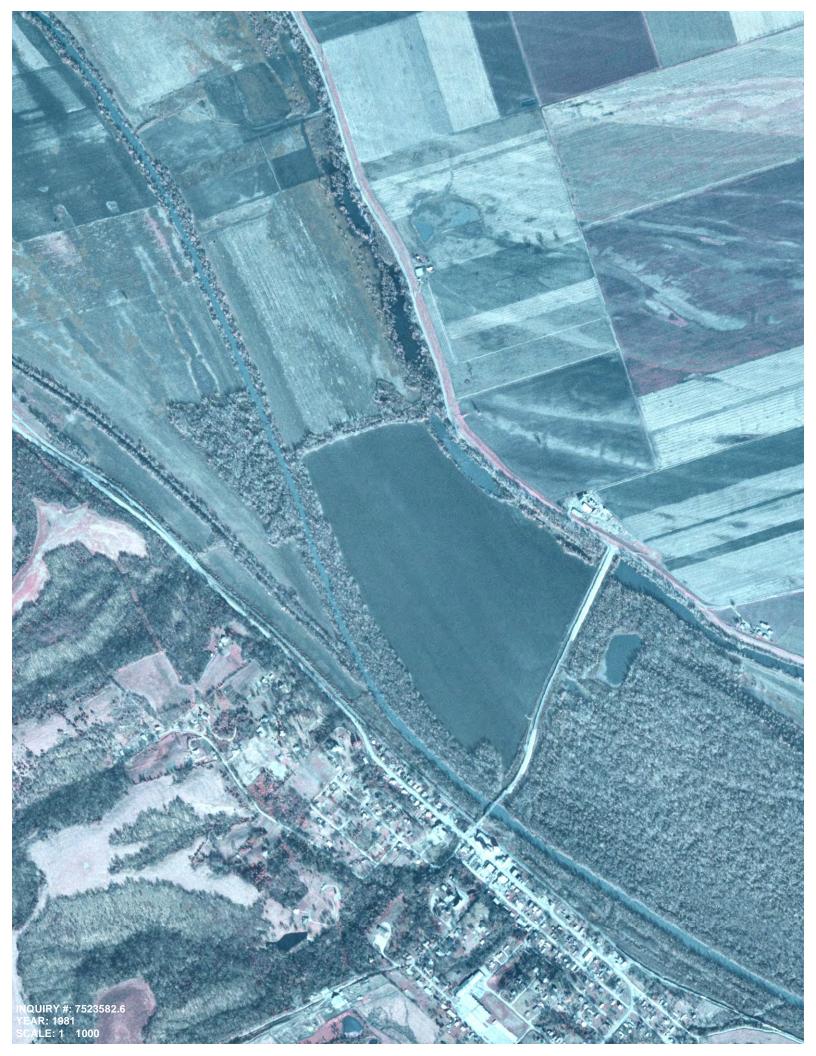




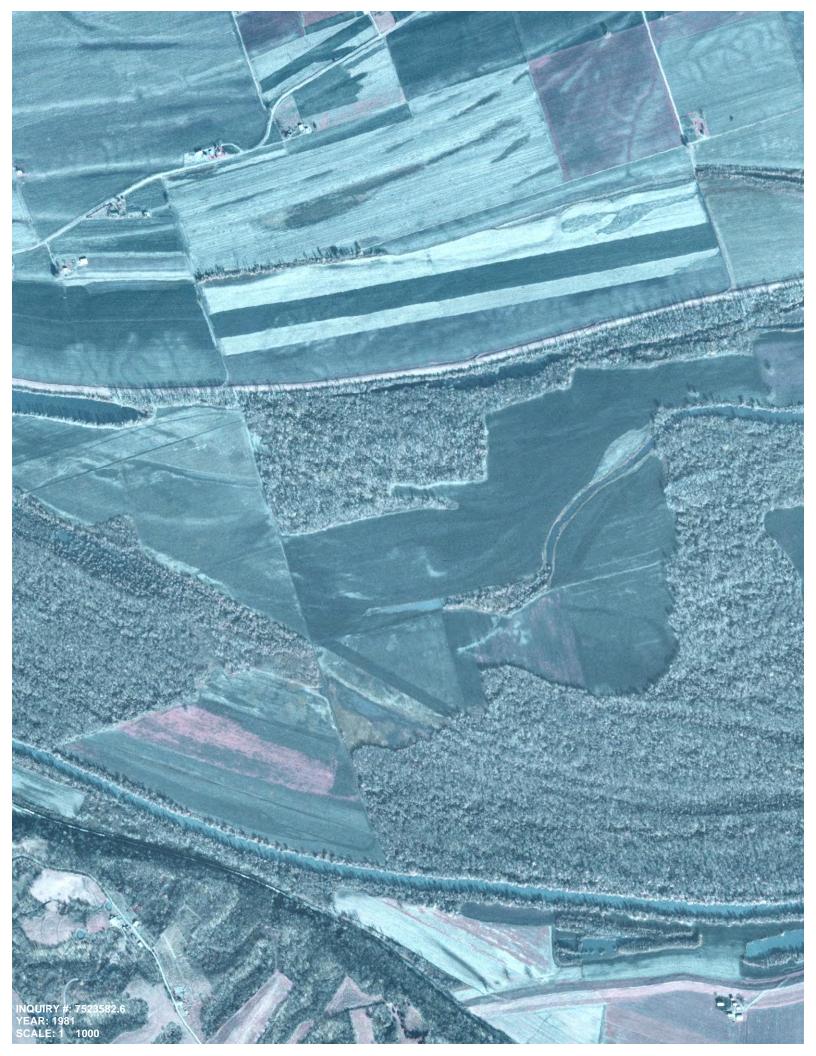


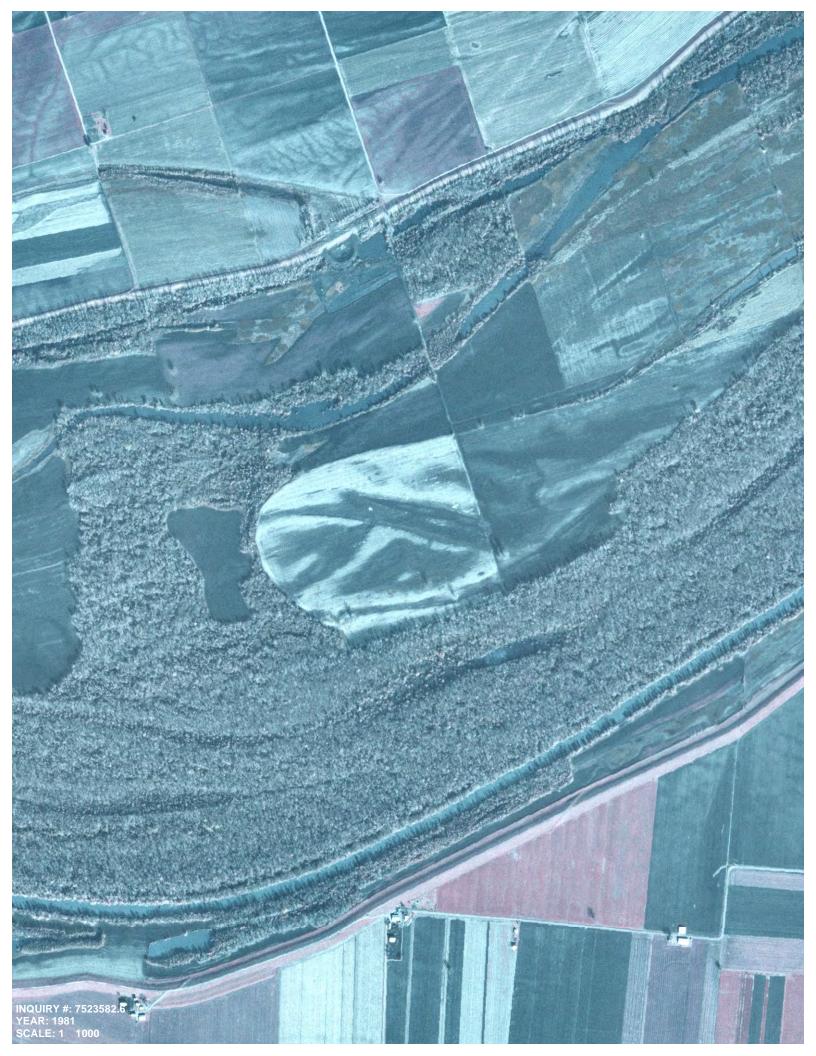


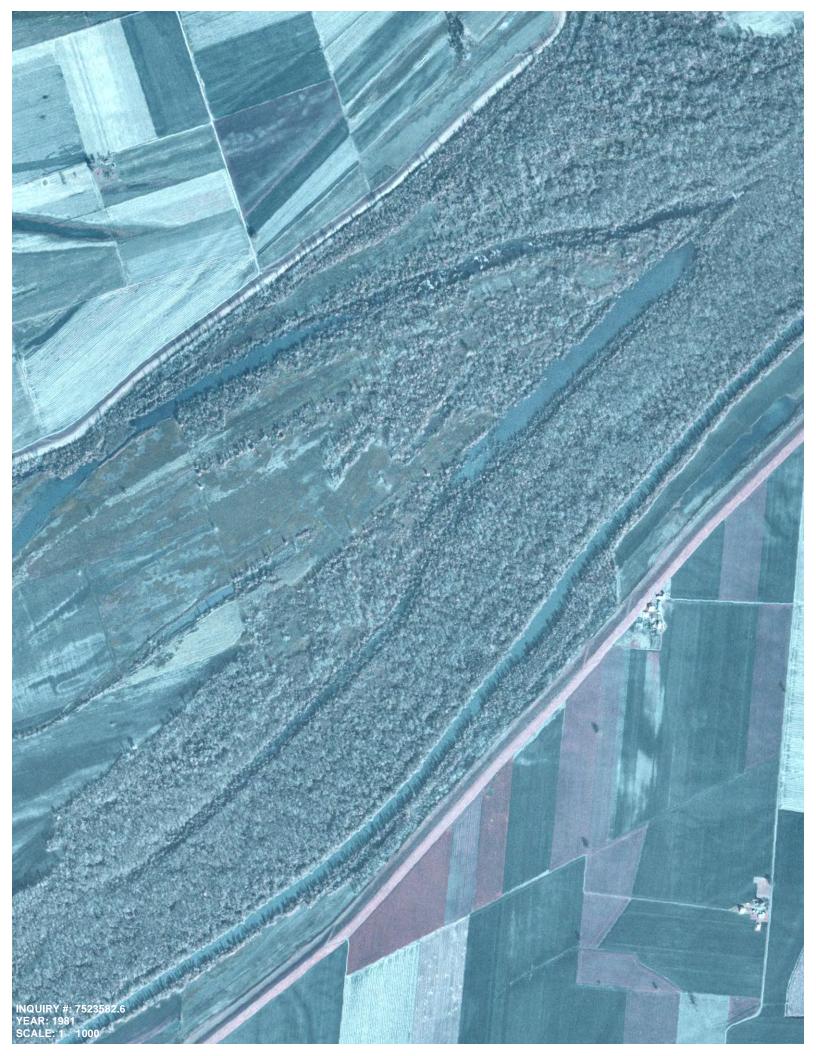




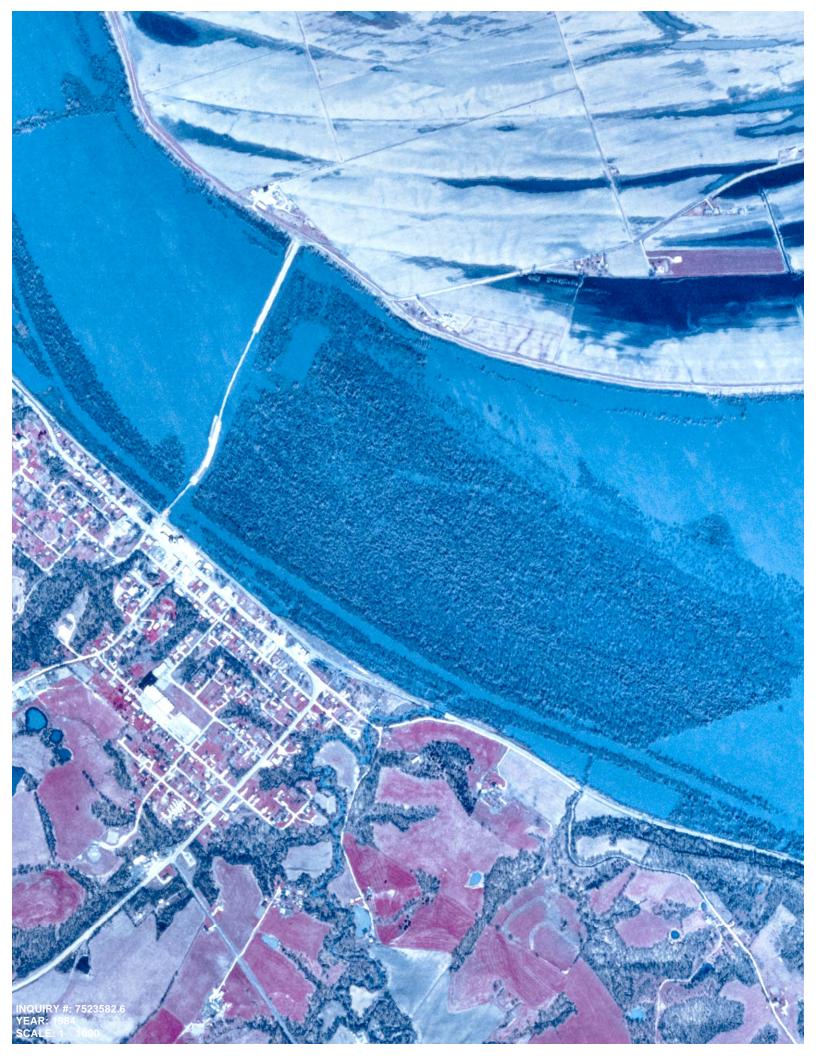




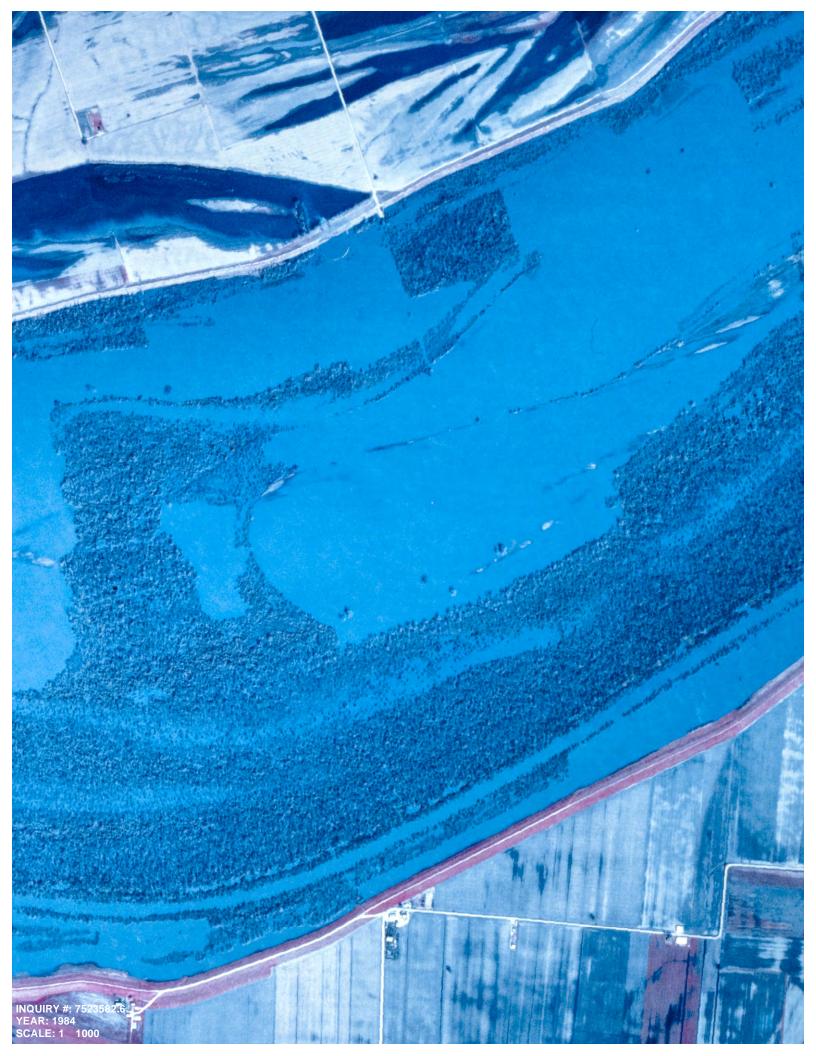


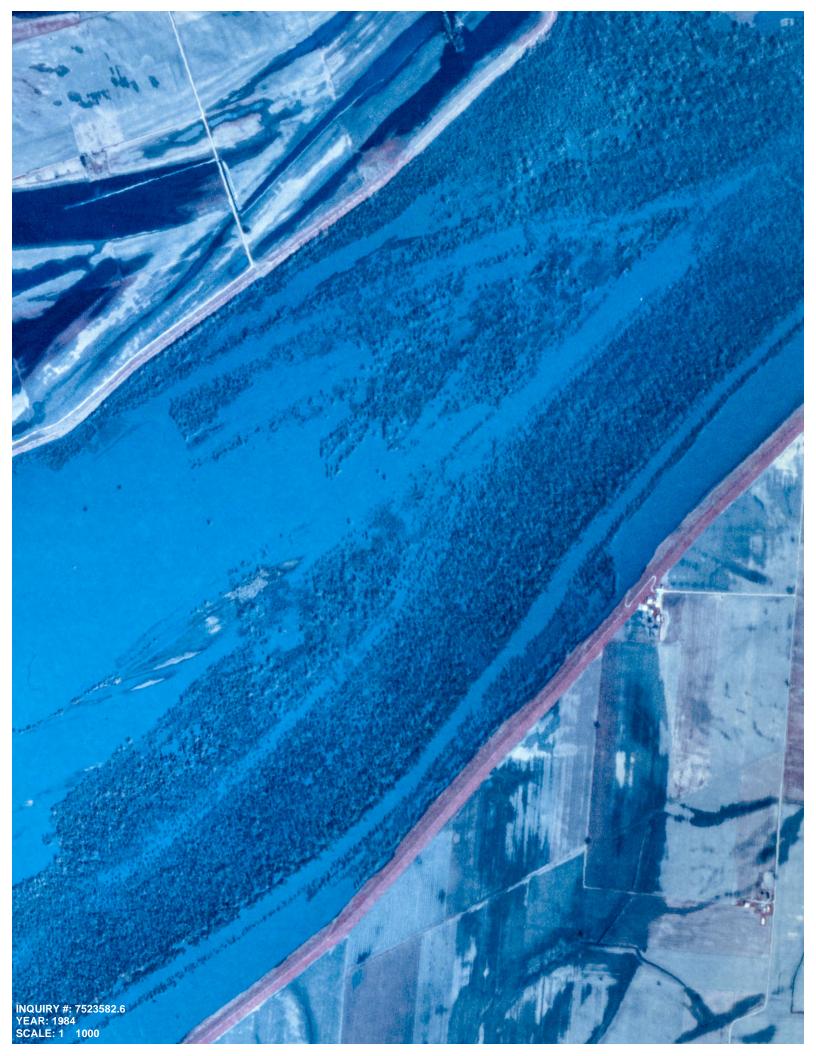






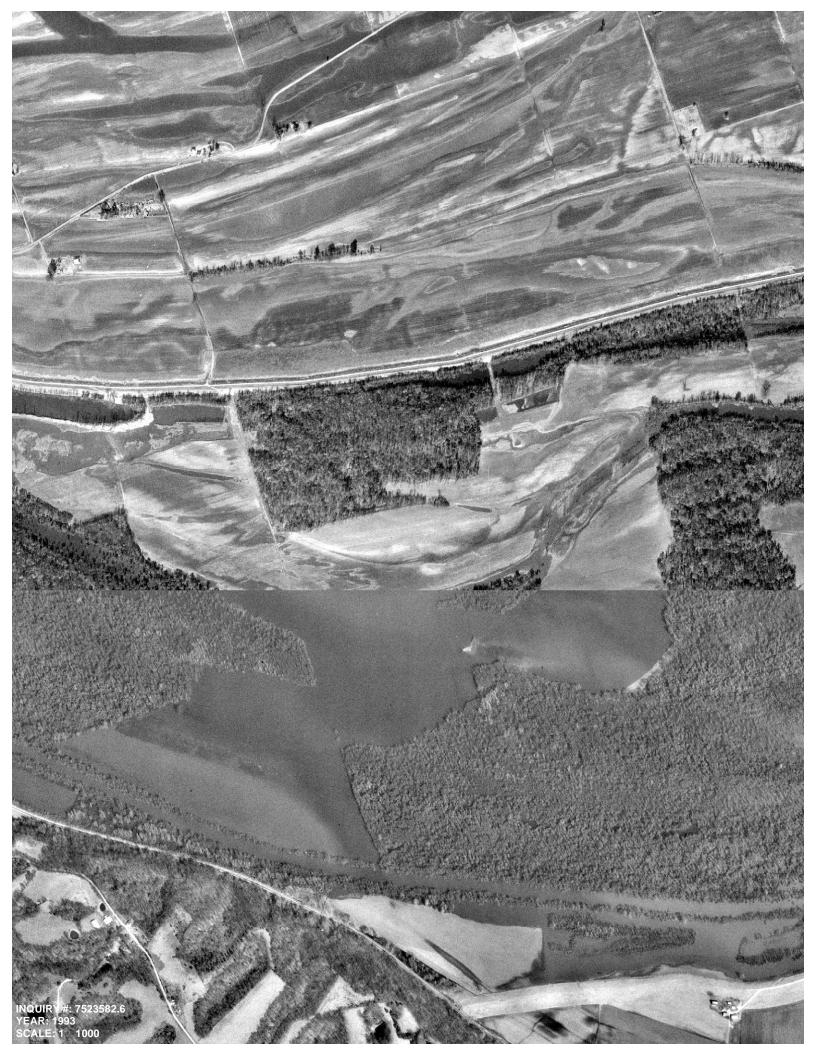










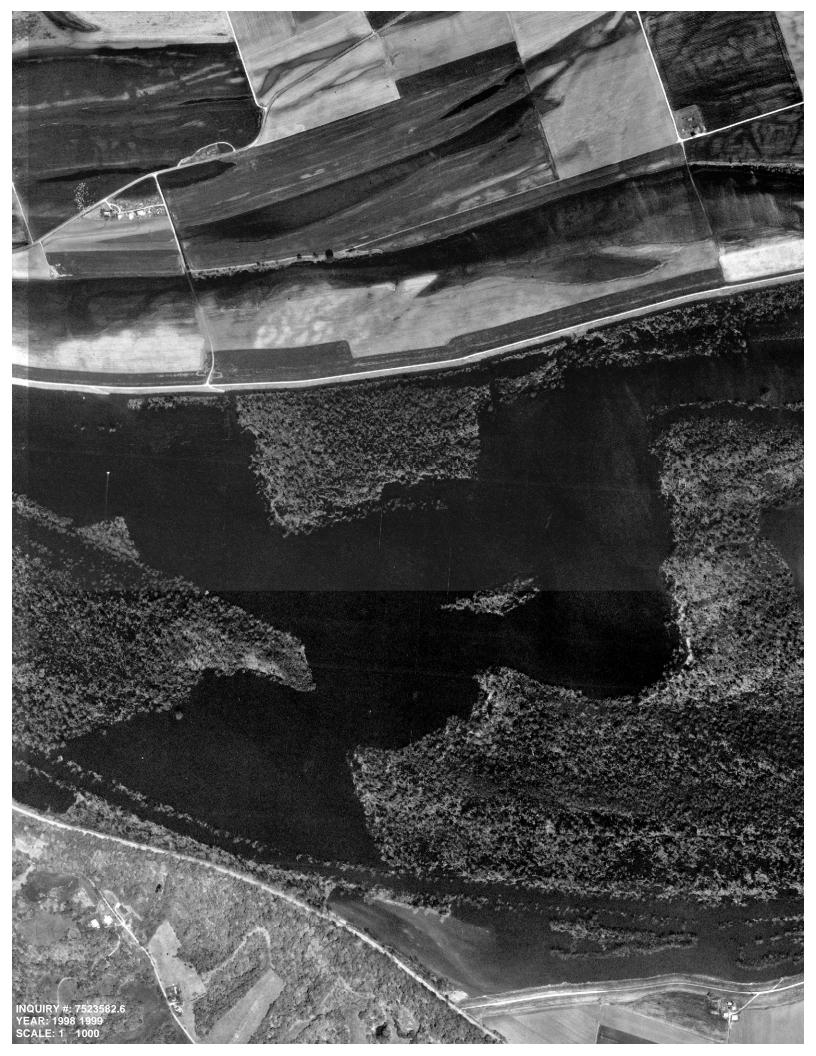


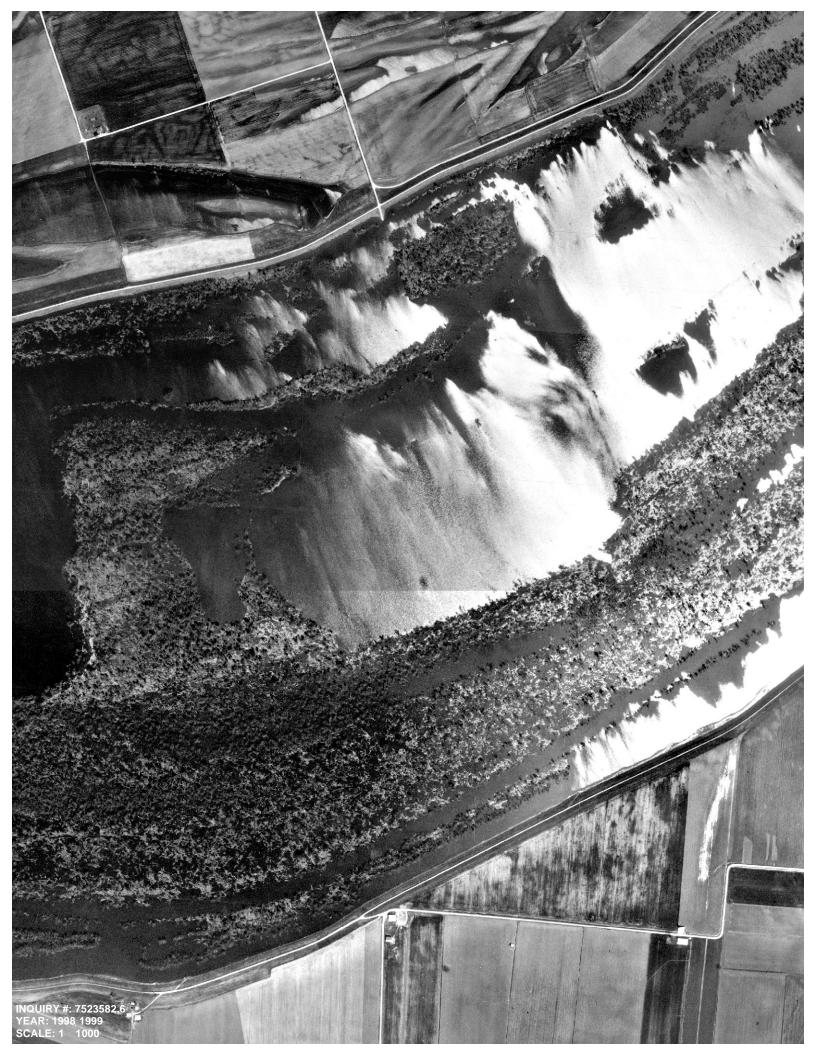










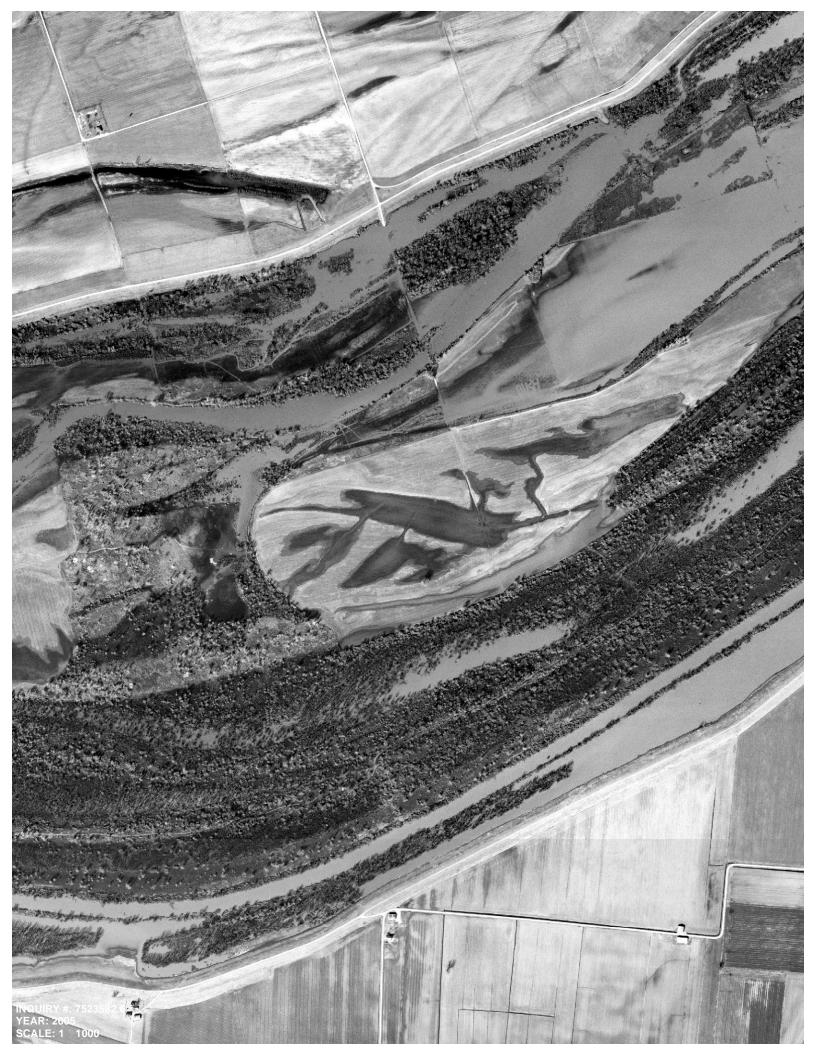




























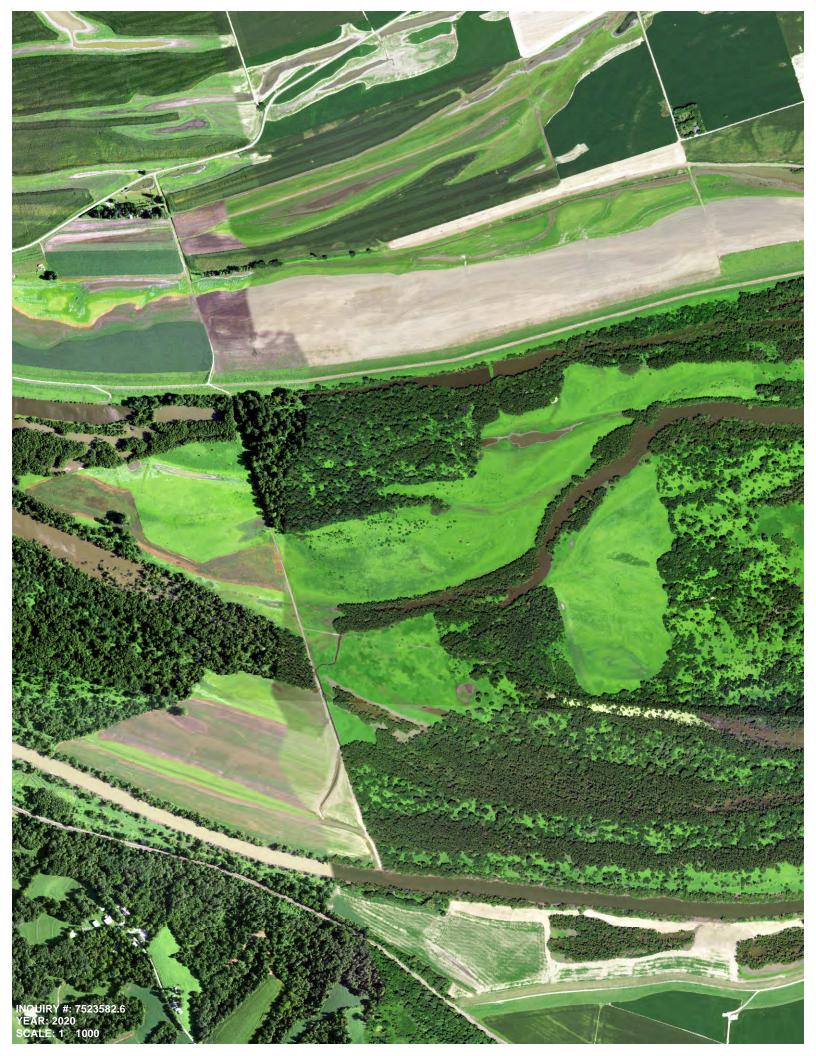




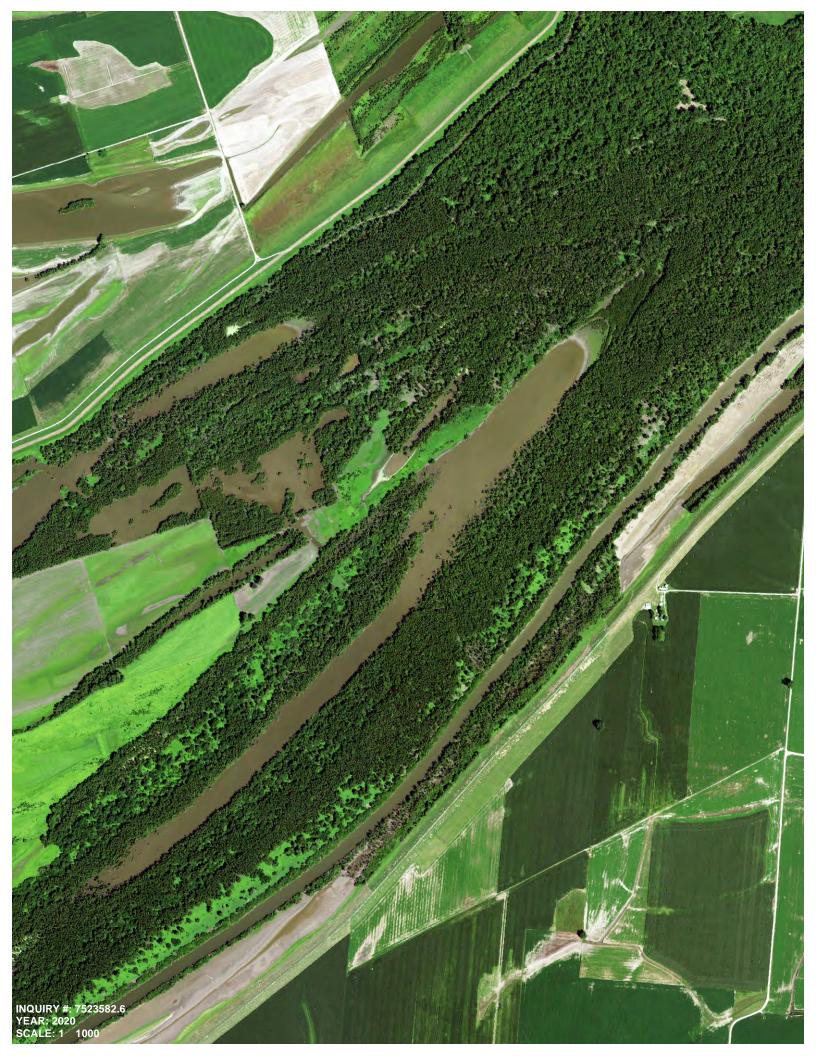












Horse Island Horse Island Saint Mary, IL 63673

Inquiry Number: 7523582.8

December 19, 2023

EDR Historical Topo Map Report

with QuadMatch™



EDR Historical Topo Map Report

12/19/23

Site Name: **Client Name:**

> U.S. Army Corps of Engineers U.S. Army Corps of Engineers

Saint Louis, MO 63103



EDR Inquiry # Contact: Kaleb Rakers

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by U.S. Army Corps of Engineers were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results: Coordinates:

NA 37.875672 37° 52' 32" North Latitude: P.O.#

-89.9075 -89° 54' 27" West Longitude: **Project:** NA

> Zone 16 North **UTM Zone: UTM X Meters:** 244271.64 **UTM Y Meters:** 4196006.28

Elevation: 360.00' above sea level

Maps Provided:

2021 1947

2018, 2017 1915

2015

2012

1996

1993, 1996

1982

1970

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2021 Source Sheets



Kaskaskia 2021 7.5-minute, 24000



Lithium 2021 7.5-minute, 24000



Chester 2021 7.5-minute, 24000



Belgique 2021 7.5-minute, 24000

2018, 2017 Source Sheets



Kaskaskia 2018 7.5-minute, 24000



Chester 2018 7.5-minute, 24000



Lithium 2017 7.5-minute, 24000



Belgique 2017 7.5-minute, 24000

2015 Source Sheets



Kaskaskia 2015 7.5-minute, 24000



Lithium 2015 7.5-minute, 24000



Chester 2015 7.5-minute, 24000



Belgique 2015 7.5-minute, 24000

2012 Source Sheets



Kaskaskia 2012 7.5-minute, 24000



Chester 2012 7.5-minute, 24000

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1996 Source Sheets



Kaskaskia 1996 7.5-minute, 24000 Aerial Photo Revised 1993



Lithium 1996 7.5-minute, 24000 Aerial Photo Revised 1993

1993, 1996 Source Sheets



Chester 1993 7.5-minute, 24000 Aerial Photo Revised 1992



Belgique 1996 7.5-minute, 24000 Aerial Photo Revised 1993

1982 Source Sheets



Kaskaskia 1982 7.5-minute, 24000 Aerial Photo Revised 1980



Lithium 1982 7.5-minute, 24000 Aerial Photo Revised 1980

1970 Source Sheets



Kaskaskia 1970 7.5-minute, 24000 Aerial Photo Revised 1968



Chester 1970 7.5-minute, 24000 Aerial Photo Revised 1968



Lithium 1970 7.5-minute, 24000 Aerial Photo Revised 1968



Belgique 1970 7.5-minute, 24000 Aerial Photo Revised 1968

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1947 Source Sheets

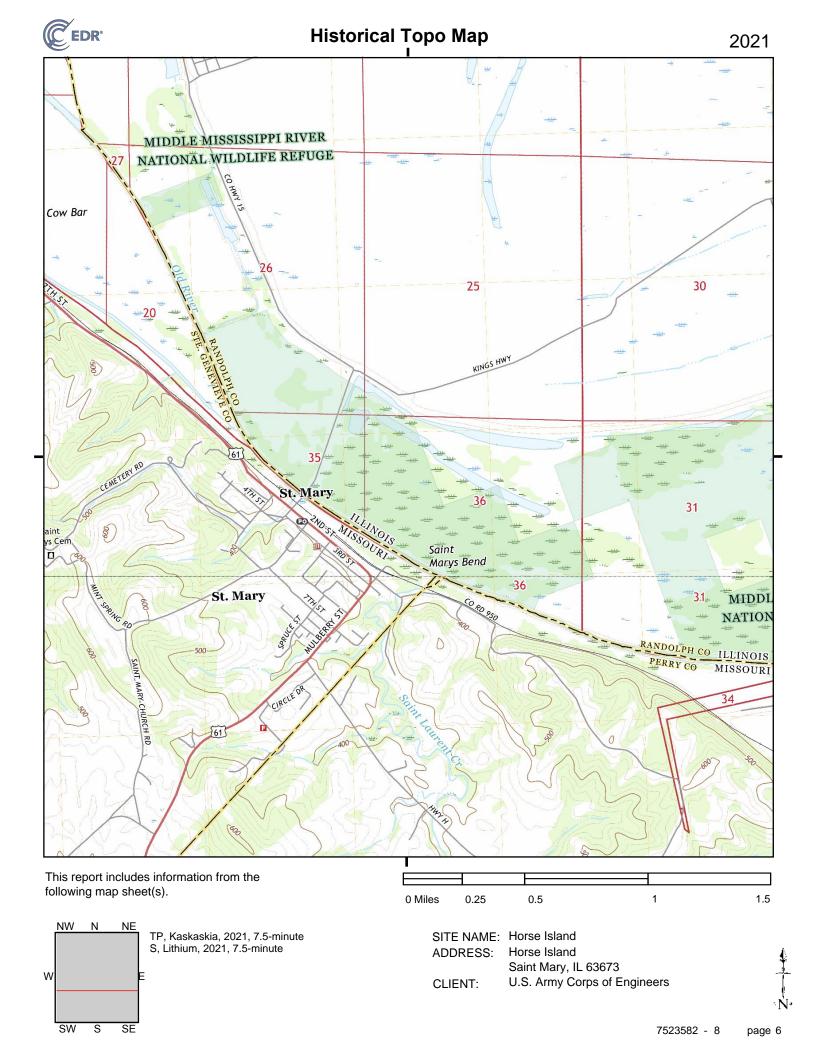


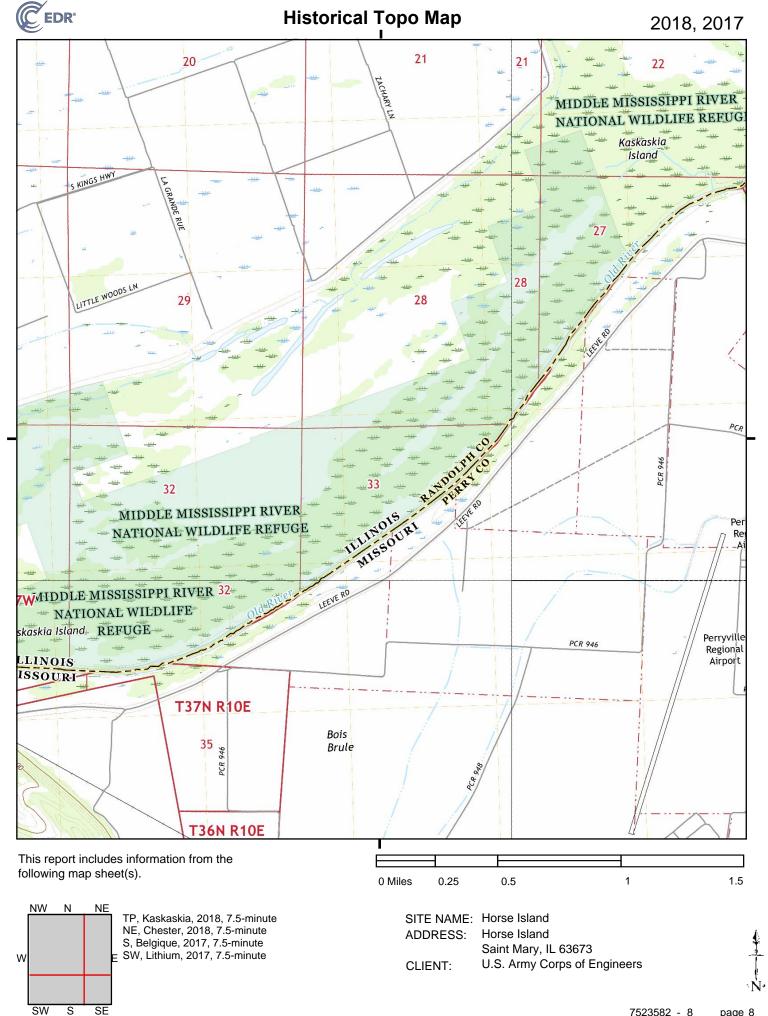
Chester 1947 15-minute, 62500

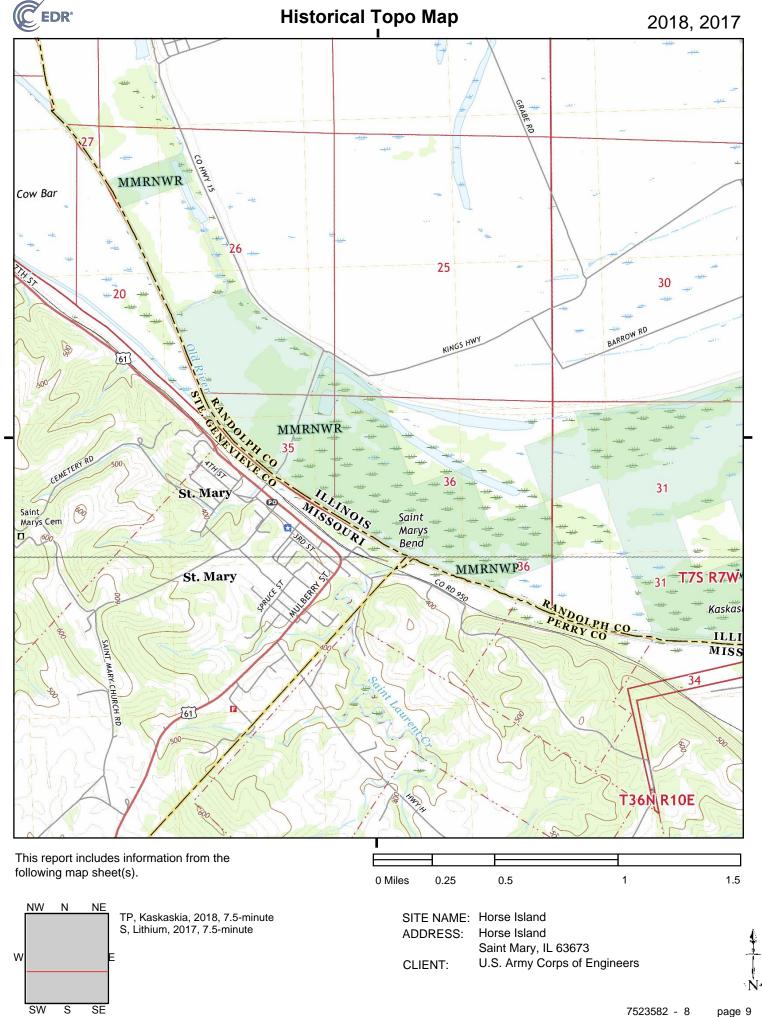
1915 Source Sheets

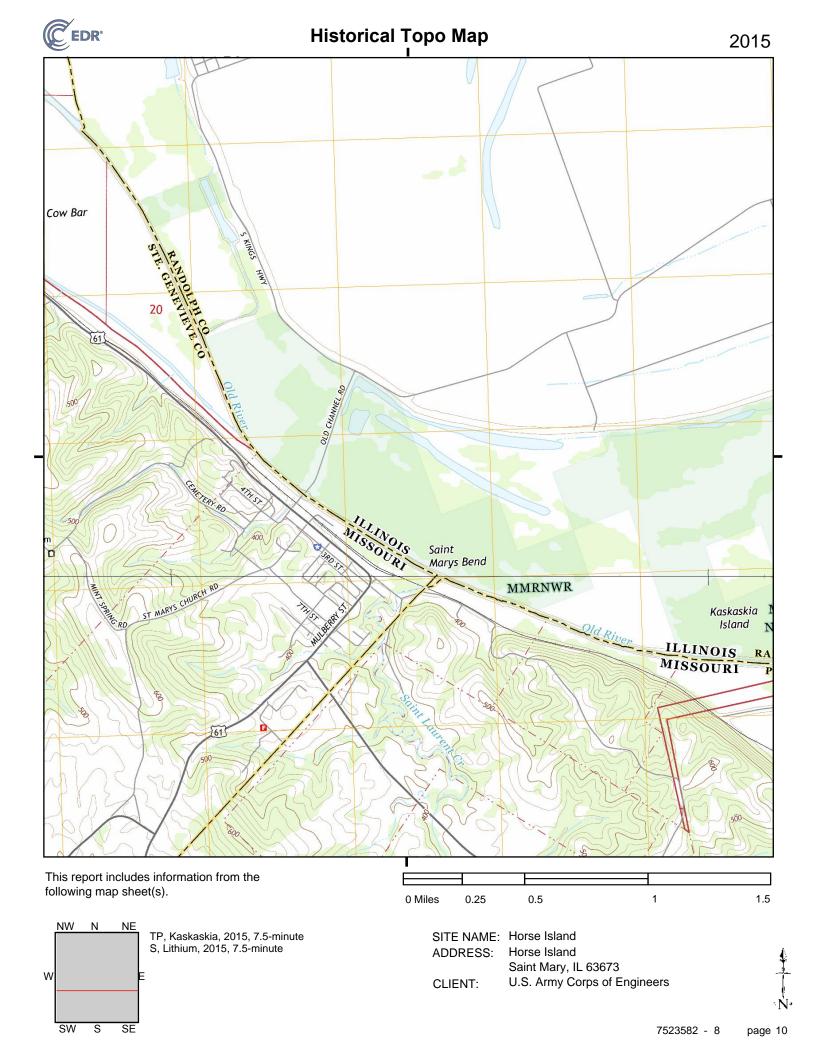


Chester 1915 15-minute, 62500







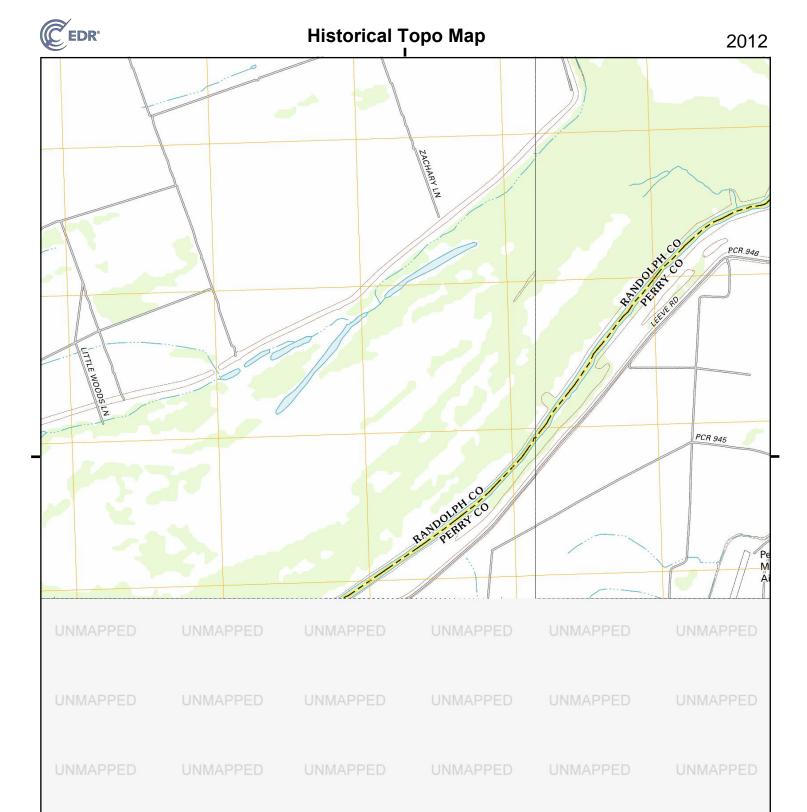


SW, Lithium, 2015, 7.5-minute

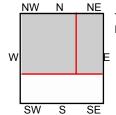


U.S. Army Corps of Engineers

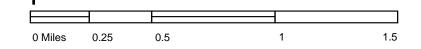
CLIENT:



This report includes information from the following map sheet(s).



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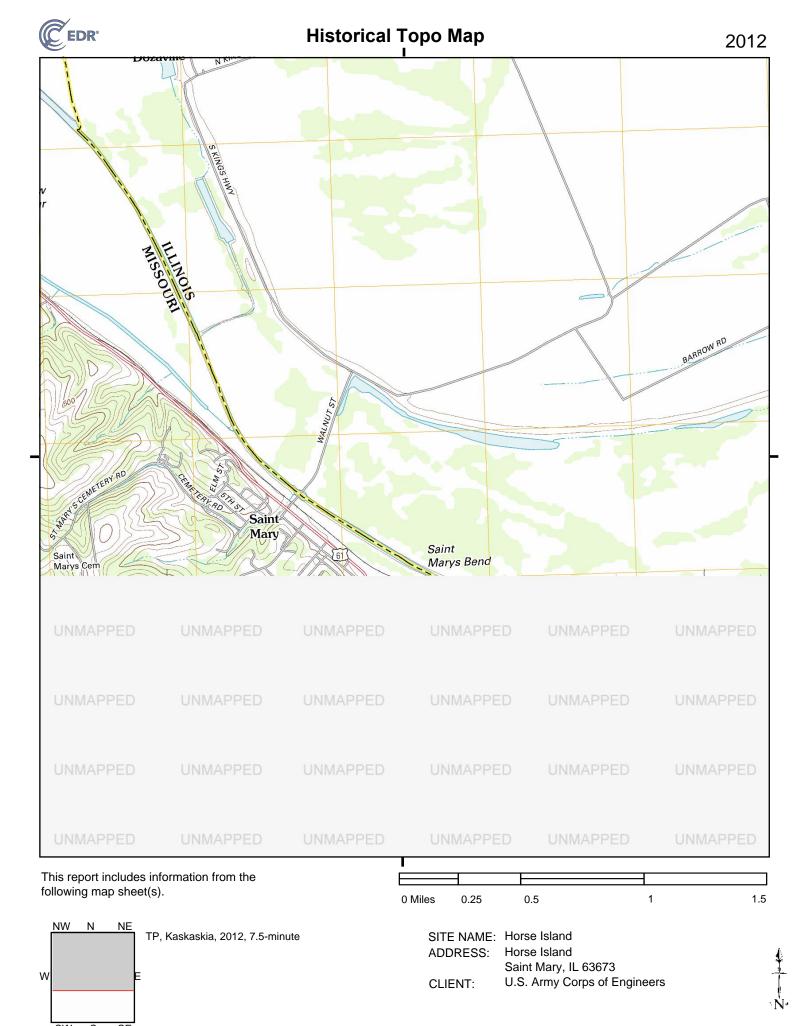


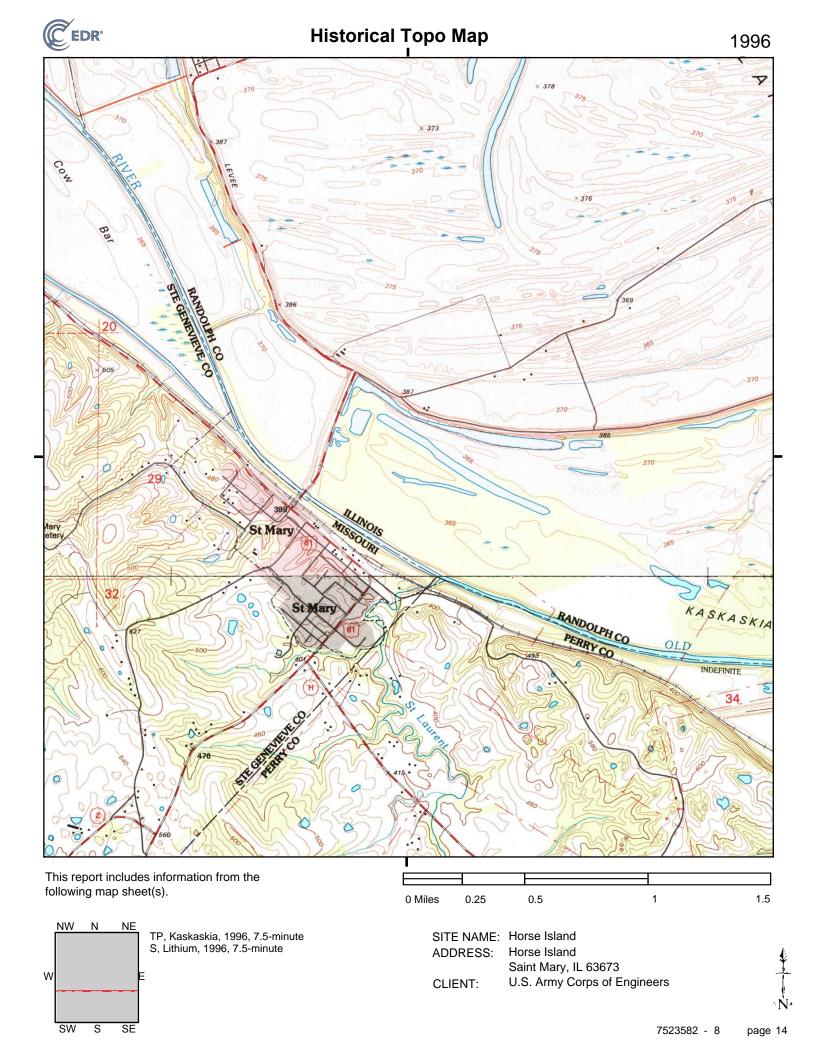
SITE NAME: Horse Island ADDRESS: Horse Island

Saint Mary, IL 63673

CLIENT: U.S. Army Corps of Engineers







SITE NAME: Horse Island

Horse Island

Saint Mary, IL 63673

U.S. Army Corps of Engineers

ADDRESS:

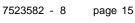
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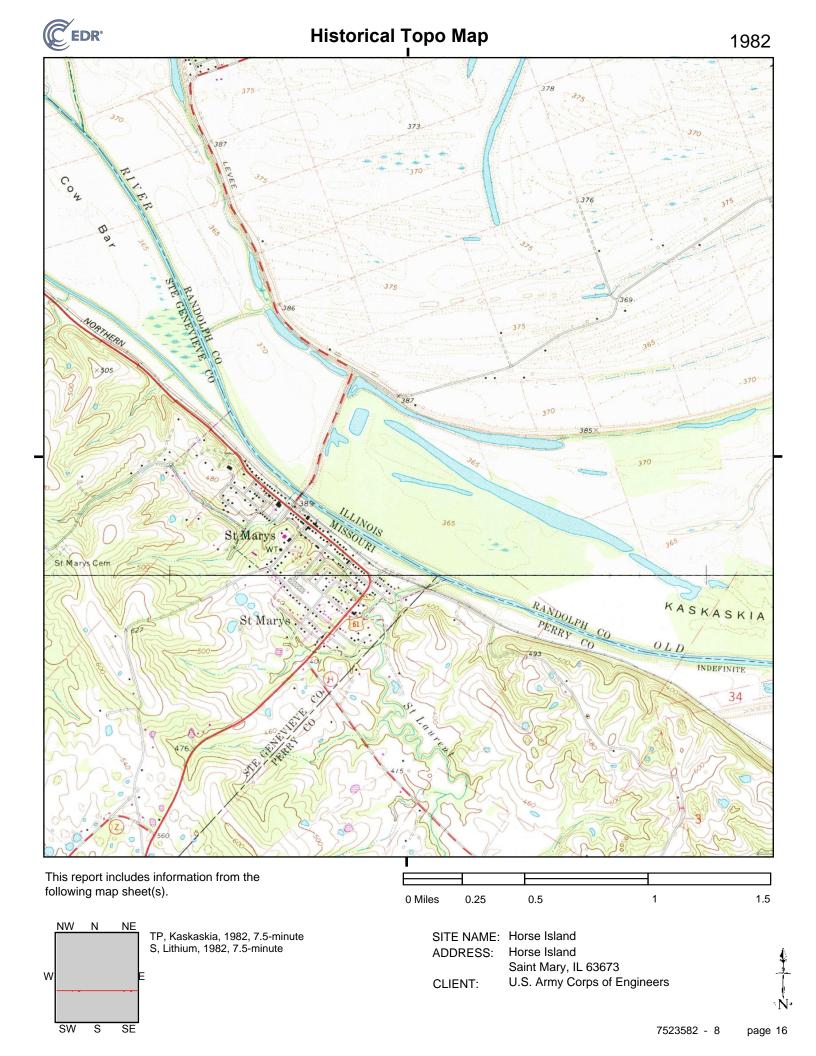
NW

TP, Kaskaskia, 1996, 7.5-minute

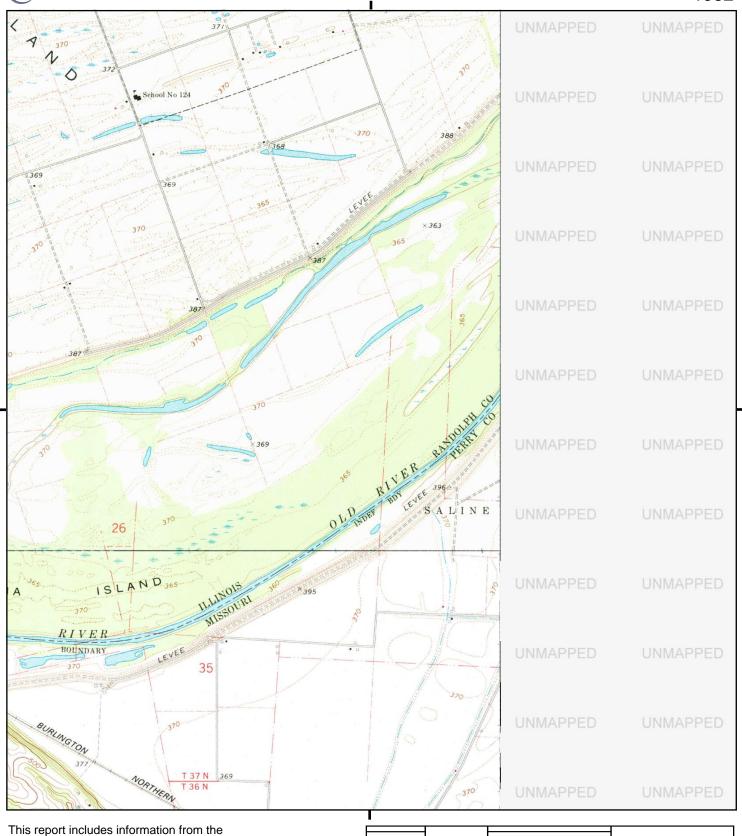
NE, Chester, 1993, 7.5-minute

SE, Belgique, 1996, 7.5-minute S, Lithium, 1996, 7.5-minute



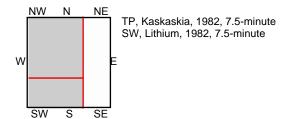






0 Miles

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0.25

0.5

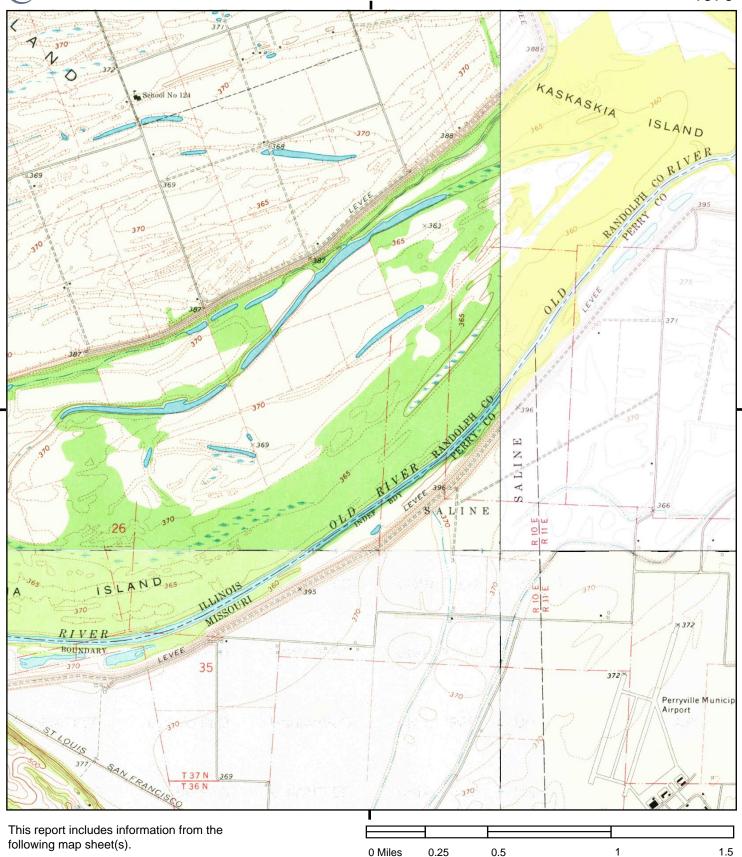
ADDRESS: Horse Island Saint Mary, IL 63673

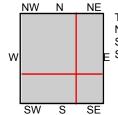
CLIENT: U.S. Army Corps of Engineers



1.5





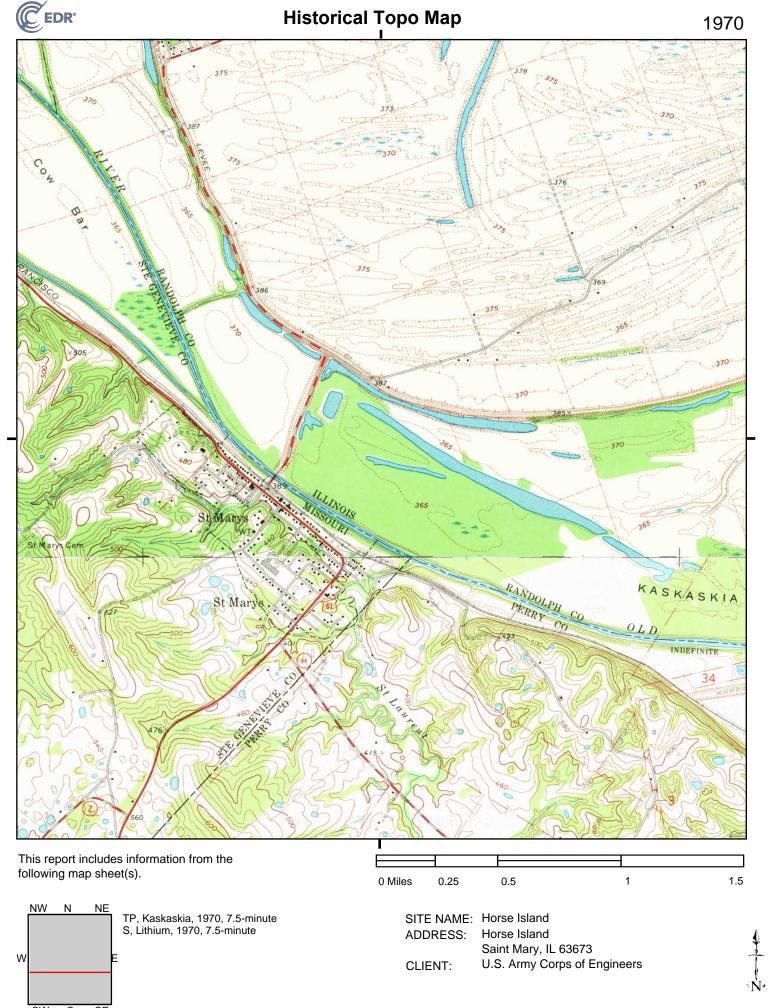


TP, Kaskaskia, 1970, 7.5-minute NE, Chester, 1970, 7.5-minute S, Belgique, 1970, 7.5-minute SW, Lithium, 1970, 7.5-minute SITE NAME: Horse Island ADDRESS: Horse Island

Saint Mary, IL 63673

CLIENT: U.S. Army Corps of Engineers





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Horse Island

Saint Mary, IL 63673

U.S. Army Corps of Engineers

ADDRESS:

CLIENT:

SITE NAME: Horse Island

Horse Island

Saint Mary, IL 63673

U.S. Army Corps of Engineers

ADDRESS:

CLIENT:

TP, Chester, 1915, 15-minute

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U.S. Army Corps of Engineers

CLIENT:

Horse Island

Horse Island Saint Mary, IL 63673

Inquiry Number: 7523582.7

December 19, 2023

The EDR-City Directory Image Report



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City Directory Images

Thank you for your business.

Please contact EDR at 1-800-352-0050 with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available business directory data at approximately five year intervals.

RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

<u>Year</u>	<u>Target Street</u>	Cross Street	<u>Source</u>
2020			EDR Digital Archive
2017			Cole Information
2014			Cole Information
2010			Cole Information
2005			Cole Information
2000			Cole Information
1995			Cole Information
1992			Cole Information

FINDINGS

TARGET PROPERTY STREET

Horse Island

Saint Mary, IL 63673

<u>Year</u>	<u>CD Image</u>	<u>Source</u>			
HORSE ISLAND					
2020	-	EDR Digital Archive	Target and Adjoining not listed in Source		
2017	-	Cole Information	Target and Adjoining not listed in Source		
2014	-	Cole Information	Target and Adjoining not listed in Source		
2010	-	Cole Information	Target and Adjoining not listed in Source		
2005	-	Cole Information	Target and Adjoining not listed in Source		
2000	-	Cole Information	Target and Adjoining not listed in Source		
1995	-	Cole Information	Target and Adjoining not listed in Source		
1992	-	Cole Information	Target and Adjoining not listed in Source		

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FINDINGS

CROSS STREETS

No Cross Streets Identified

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NESP Project Implementation Report with Integrated EA Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)

NAVIGATION AND ECOSYSTEM SUSTAINABILITY PROGRAM

PROJECT IMPLEMENTATION REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

HORSE ISLAND ECOSYSTEM RESTORATION PROJECT

OPEN RIVER, MIDDLE MISSISSIPPI RIVER MILES RM 113-111 RANDOLPH COUNTY, IL

Appendix F – Real Estate

March 28, 2025



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1. PURPOSE

This Real Estate Plan (REP) has been prepared to present the real estate requirements and support the proposed U.S. Army Corps of Engineers (USACE) navigation and ecosystem restoration project on Horse Island. The proposed project focuses on forest diversity and topographic diversity at the Horse Island Division of the Middle Mississippi River National Wildlife Refuge. The sponsor for this project is the United States Fish and Wildlife Service (USFWS).

The Refuge is located on the Mississippi River downstream from St. Louis, Missouri. The Horse Island Division is near Kaskaskia, Illinois at River Mile (RM) 113-111 on Kaskaskia Island (**Figure F-1**). Lands in the study area are within the Refuge boundary and are owned by USFWS; there are also privately owned inholdings. The study area comprises a total of 2,000 acres and consists of point bar (floodplain forest, riverfront forest, shrub swamp, and old field habitats) and backswamp (willow, shrub swamp and open water habitats) geomorphic surfaces on the riverside of the levees. Current land use is approximately 20% non-forested abandoned agricultural fields, and 80% riverfront forest communities.

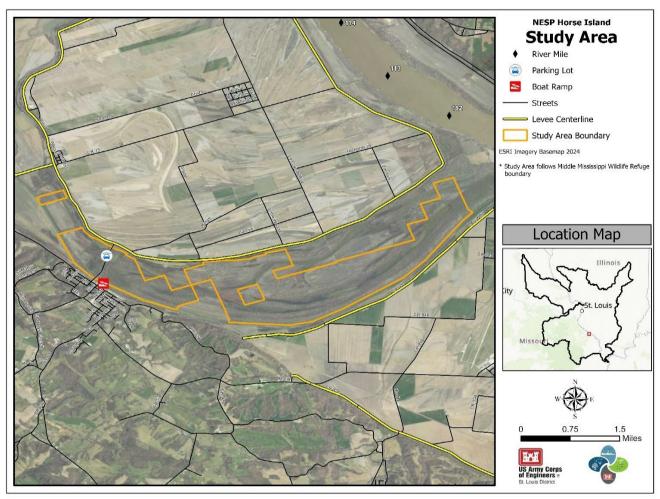


Figure F-1. Study Area

1.1 Authority

The Navigation and Ecosystem Sustainability Program (NESP) is a dual-purpose navigation and ecosystem restoration program for the Upper Mississippi River and Illinois Waterway (UMR-IWW) System authorized by Title VIII (Sections 8001-8005) of the Water Resources Development Act (WRDA) of 2007 (Public Law (PL) 110-114, 33 USC 652 statutory note), substantially in accordance with the Report of the Chief of Engineers dated 15 December 2004 (Chief's Report). NESP is a regional program that includes geographic areas within the boundaries of the USACE St. Paul, Rock Island, and St. Louis Districts. The navigation portion of the NESP includes both small- and large-scale navigation improvements and mitigation. The ecosystem restoration portion of the NESP includes large projects at specific locations and a programmatic authorization for projects with a total single project cost not to exceed \$25 million. Under the ecosystem restoration portion of NESP, a project will be implemented at 100 percent Federal expense if it (i) is located below the ordinary high-water mark (OHWM) or in a connected backwater; (ii) modifies the operation of structures for navigation; or (iii) is located on federally owned land. All other ecosystem restoration projects under the NESP are implemented with cost sharing of 65 percent Federal, 35 percent non-federal. (PL 110-114, Section 8004(b)(3)).

2. LANDS, EASEMENTS, AND RIGHTS-OF-WAY (LER)

The Tentatively Selected Plan (TSP) is Alternative 5: Maximum (Figure F-2). The TSP includes 223 acres of ridges and swales, 434 acres of tree planting (much of which is on the ridges and swales once constructed), 1,254 acres of Forest Stand Improvement (FSI), and 163 acres of wetland restoration. The tree planting would be implemented in a phased approach, separated over time and space. The species selected for planting would be chosen based on elevation to increase resiliency and habitat diversity across the island.

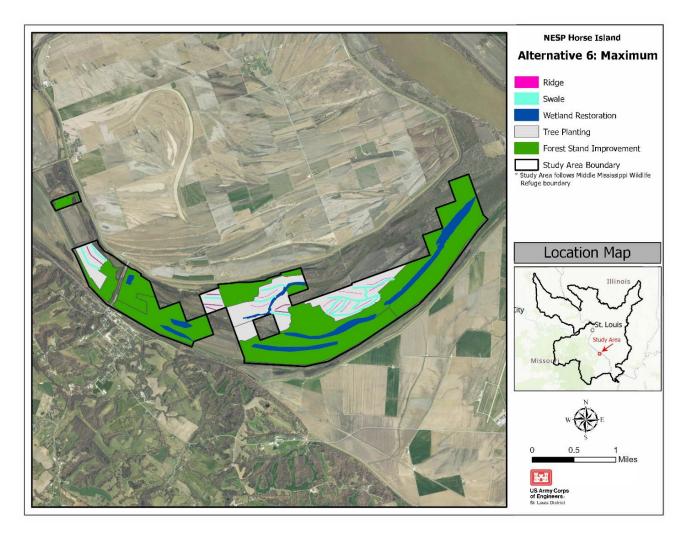


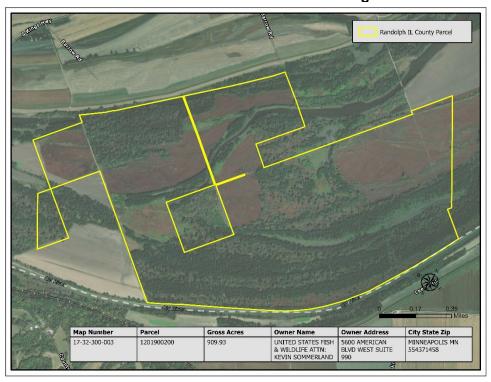
Figure F-2. Alternative 5 – Maximum

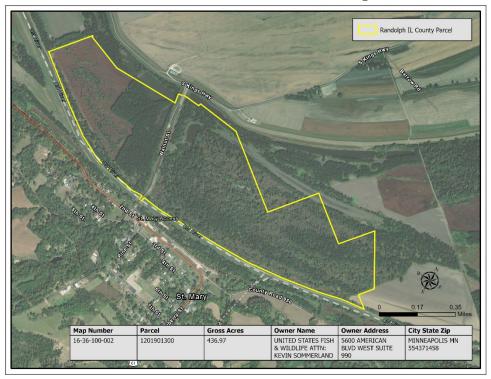
All proposed project features are on lands owned by the United States of America in Fee Simple and currently managed by the USFWS. These lands are known in the public land record of Randolph County, IL as: (Public roads will be utilized to reach the USFWS managed lands)

| Randolph IL County Parcel | Gross Acres | Owner Name | Owner Address | City State Zip | Minus | Triangle | T

Parcel # 12-019-002-50 with an estimated acreage of 575.41

Parcel 12-019-002-00 with an estimated acreage of 909.93





Parcel 12-019-013-00 with an estimated acreage of 436.97

Parcel 12-019-014-00 with an estimate acreage of 18.84



3. SPONSOR-OWNED LER

The Federal Sponsor for this project is the USFWS. Proposed project features are on lands owned by the United States of America as shown in section 2 of this real estate plan.

4. NON-STANDARD ESTATES

No non-standard estates are required for implementation of this Project.

5. EXISTING FEDERAL PROJECTS

Portion of the Middle Mississippi River (MMR) Stone Dike Alterations ecosystem restoration is near the current proposed project. This federal project is currently in its feasibility stage and its main focus is on dike alterations within two river reaches (RM 147-157 and RM 118-128) in the MMR. The proposed features within the Stone Dike study area and the Horse island area are complimentary to each other it will cause no negative interference.

6. FEDERALLY OWNED LANDS

Project features are located on lands owned by the United States of America as shown in section 2 of this real estate plan.

7. NAVIGATION SERVITUDE

This project does not require the utilization of navigational servitude to implement its proposed features.

8. MAPPING

A map of the site location is shown in Figure F-1.

9. INDUCED FLOODING

Hydrology and Hydraulics conducted a no-rise analysis, and the entirety of those finding are located in Appendix A of the main report. The model was used to verify proposed project features would not impact flood stage. Illinois state guidelines dictate that in rural areas such as the project site, proposed features may not cause more than 0.5 feet of rise in water surface elevation under a 0.01% AEP) (Illinois Department of Natural Resources, 2014).

Illinois Department of Natural Resources (IDNR) was consulted in January of 2025 regarding this potential project. From that meeting, the PDT learned that a hydraulic model may not be necessary for obtaining a no-rise permit; however, if it is required only topographic changes (ridges and swales) should be accounted for in the model. Changes to land cover (from planted vegetation) is not regulated by IDNR, and therefore, it should not be accounted for in the model.

For the 0.01 AEP, the model does not show any rise (other than model errors outside the project area) that exceed 0.004 feet.

10. BASELINE COST ESTIMATE

The total estimated cost during PED and Construction is (FY25\$) \$15,000 for USACE Saint Louis District Real Estate project support.

Account	Cost
01: Lands and Damages	

Account	Cost
Total L&D	\$ -
02: Relocations:	
Total Relocation	\$-
30/31: PED/Construction	
Federal Real Estate Support	\$12,000.00
Contingency @25%	\$3,000.00
Total 30/31	\$15,000.00
Total RE Support (All Accounts FY25\$)	\$15,000.00

11. RELOCATION ASSISTANCE BENEFITS

None of the proposed features require the Project to provide temporary or permanent relocation benefits to residential, farm or business entities.

12. MINERAL ACTIVITY

There are no known mineral rights or activities affecting the study area.

13. SPONSOR ASSESSMENT

This Project is 100% a Federal Project. No Sponsor is required.

14. ZONING

There is no zoning impacts or requirements for this project.

15. SCHEDULE OF LAND ACQUISITION MILESTONES

The lands, easements, or rights-of-way required for this project are owned by the United States of America and managed by USFWS. No land acquisition is required to support project features.

16. FACILITY OR UTILITY RELOCATIONS

There are no requirements for facility or utility relocations.

17. HTRW

According to Appendix F - HTRW of the main report, it's the Environmental Professional's opinion that the Project Area contains no major sites of interest that would impact the project's cost or schedule. The environmental impact for the migration of off-site contaminants onto the Project Area is negligible. Therefore, a Phase II ESA is not recommended at this time.

18. LANDOWNER ATTITUDE

There is no known landowner opposition to this Project.

19. NOTIFICATION TO THE SPONSOR REGARDING THE RISKS ASSOCIATED WITH LAND ACQUISITION BEFORE EXECUTION OF THE PROJECT PARTNERSHIP AGREEMENT (PPA)

The sponsor of this project is a federal entity that doesn't require the execution of a PPA. This project will be funded, 100% from congressional appropriated dollars on lands owned by the United

States of America.

20. OTHER RELEVANT REAL ESTATE ISSUES

No other known relevant real estate issues exist.

Prepared by:	Reviewed by:
--------------	--------------

Edwin Ramos Chief, Planning & Acquisition Saint Louis District Mississippi Valley Division U.S. Army Corps of Engineers Jennifer L. Wilson Chief, Real Estate Division Saint Louis District Mississippi Valley Division U.S. Army Corps of Engineers Navigation and Ecosystem Sustainability Program
Draft Feasibility Report with Integrated Environmental Assessment
Pool 24 Islands – Denmark & Drift

Appendix G Cost

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Appendix G. Cost

1 COST ESTIMATE SUMMARY

1.1 GENERAL

The Refuge is located on the Mississippi River downstream from St. Louis, Missouri. The Horse Island Division is located near Kaskaskia, Illinois [River Mile (RM) 113-111] on Kaskaskia Island. While it lies west of the Mississippi River, Horse Island is within Illinois rather than Missouri; the state boundary was designated when the main river channel flowed to the west of the study area. Lands in the study area are within the Refuge boundary and are owned by USFWS; there are also privately owned inholdings. The study area comprises a total of 2,000 acres and consists of point bar (floodplain forest, riverfront forest, shrub swamp, and old field habitats) and backswamp (willow, shrub swamp and open water habitats) geomorphic surfaces on the riverside of the levees. Current land use is approximately 20% non-forested abandoned agricultural fields, and 80% riverfront forest communities

The objectives for the NESP Horse Island project are as follows:

- a. Restore floodplain forest communities
- b. Restore hydrologic function to the floodplain
- c. Restore and enhance the quality and diversity of wetland habitat

The final array of alternatives include:

- No Action
- Minimum 2
- Intermediate 1
- Intermediate 2
- Intermediate 3
- Maximum

The measures included in each Alternative are listed below:

Minimum 2 Alternative:

Ridge and Swale Creation and Tree Planting

Intermediate 1 Alternative:

Ridge and Swale Creation, and Forest Stand Improvement

Intermediate 2 Alternative:

• Ridge and Swale Creation, Forest Stand Improvement, and Wetland Restoration in 3 locations

Intermediate 3 Alternative:

 Ridge and Swale Creation, Forest Stand Improvement, and Wetland Restoration in 6 locations

Maximum Alternative:

• Ridge and Swale Creation, Forest Stand Improvement, and Wetland Restoration in 7 locations

A detailed cost estimate, abbreviated risk analysis, and construction schedule were developed for the recommended plan: Maximum Alternative.

1.2 BASIS OF COST ESTIMATE

The cost estimate has been prepared based on current concept designs and site-specific information available to date.

Quantities were developed by the MVS Civil Design Section and Environmental Section. The Cost estimate was developed using MCACES. MCACES was used to develop the staging and ridge and swale creation. USACE Forester's developed the tree planting, forest stand improvement, and wetland restoration costs. The wage rates were developed using Davis Bacon, Heavy & Highway construction for Randolph County, IL IL20250016 Last Revised February 14, 2025. The MII 2024 Equipment Region 5 was used for equipment rates. The 2024 Cost Book was used.

It is assumed that there will be two different swale excavation and ridge creation crews working at once to meet schedule demands. A hydraulic excavator will excavate the swale areas and stockpile material next to excavation site for a tracked dozer to move material to the nearby ridge area. No truck hauling of the material will be necessary as the cut/fill areas are adjacent and in open areas. It is currently assumed that no clearing will be necessary for the cut/fill areas The entire footprint of the ridge/swale area (184 acres) will be stripped and stockpiled for topsoil placement prior to seeding. It is assumed that access to the site is already present from the proposed staging areas. Crews will mobilize equipment on trucks/trailers and set up staging area with office trailer.

Ridge and Swale construction is assumed to be a net balance between cut and fill. If there is not enough material from the swale cuts to create the new ridges, a borrow site would need to be identified. This risk has been captured in the abbreviated risk analysis (ARA).

Tree planting, FSI, and Wetland Restoration costs were developed by USACE foresters and biologists and included in the CSI tasks. Tree planting activities were assumed to be subcontracted. It is assumed at this time that there will be one contract for Ridge & Swale construction, one contract that is for Tree Plantings, and one contract for FSI. It is assumed that these contracts will be concurrent, and all contracts will be awarded at the same time. Tree planting, FSI, and wetland restoration costs are included in "Tree Planting Estimates.xlsx" Since the tree plantings will occur over a 5 - 7-year period, there is a significant risk of a high water

event causing damage to many of the newly planted trees. The only correction for this would be to replant those affected trees. A risk for this is captured in the ARA.

1.3 CONTINGENCIES

The Abbreviated Risk Analysis process indicated a 37% construction contingency based on associated project risks for the Recommended Plan. The total project contingency is 32%. An 18% contingency was applied to planning, engineering, and design and construction management had a contingency of 12%.

1.4 PLANNING, ENGINEERING, AND DESIGN (PED)

Planning, engineering, and design costs are based on historical data of similar projects in the St. Louis District. Recommended percentages by the cost MCX were taken into consideration as well. 18% of the construction cost was used to determine the PED costs. The Adaptive Management and Monitoring costs are not included in the total project costs for this project as they are captured by in the NESP programmatic costs.

1.5 CONSTRUCTION MANAGEMENT

Construction Management costs are based on historical data of similar projects in the St. Louis District. Recommended percentages by the cost MCX were taken into consideration as well. 10% of the construction cost was used to determine the CM costs.

PROJECT: NESP Horse Island

PROJECT NO: P2 514198 LOCATION: Kaskaskia, Illinois

This Estimate reflects the scope and schedule in report;

Horse Island PIR Report

DISTRICT: St. Louis District PREPARED: 3/17/2025

POC: CHIEF, COST ENGINEERING, Drew Collins

Civi	il Works Work Breakdown Structure		ESTIMAT	ED COST					JECT FIRST (stant Dollar E				TOTAL PROJECT COST (FULLY FUNDED)			
									Budget EC): Level Date:	2026 1 OCT 25	ı					
WBS <u>NUMBER</u> A	Civil Works <u>Feature & Sub-Feature Description</u> B	COST _(\$K) 	CNTG _(\$K) 	CNTG _(%) <i>E</i>	TOTAL _(\$K) <i>F</i>	ESC (%) G	COST _(\$K)_ <i>H</i>	CNTG (\$K)	TOTAL _(\$K)_ 	Spent Thru: 1-Oct-24 _(\$K)_	TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST _(\$K) <i>M</i>	CNTG (\$K) N	FULL (\$K) O	
06	FISH & WILDLIFE FACILITIES	\$12,579	\$4,628	36.8%	\$17,207	2.7%	\$12,919	\$4,753	\$17,672	\$0	\$17,672	7.6%	\$13,904	\$5,116	\$19,020	
	CONSTRUCTION ESTIMATE TOTALS:	\$12,579	\$4,628	-	\$17,207	2.7%	\$12,919	\$4,753	\$17,672	\$0	\$17,672	7.6%	\$13,904	\$5,116	\$19,020	
30	PLANNING, ENGINEERING & DESIGN	\$2,264	\$410	18.1%	\$2,674	3.1%	\$2,334	\$423	\$2,757	\$0	\$2,757	2.7%	\$2,397	\$434	\$2,830	
31	CONSTRUCTION MANAGEMENT	\$1,258	\$150	11.9%	\$1,408	3.1%	\$1,297	\$154	\$1,451	\$0	\$1,451	9.6%	\$1,422	\$169	\$1,591	
	PROJECT COST TOTALS:	\$16,101	\$5,188	32.2%	\$21,289		\$16,551	\$5,330	\$21,881	\$0	\$21,881	7.1%	\$17,723	\$5,719	\$23,441	
		CHIEF, C	COST EN	IGINEER	ING, Drew	Collin	s									
		PROJEC	T MANA	AGER, Sh	nane Simm	ons				ESTIMATI	ED TOTAL F	PROJECT	COST:		\$23,441	
		CHIEF F	REAL ES	TATE J	ennifer Wils	s			NESP FEASIBILITY STUDY COST:					\$700		
		CHIEF, F		•		•			ESTIMATED FEDERAL COST OF PROJECT:					\$24,141		
		,		,	usan Wilso	\n										
		,		·	ou Dell'Orco											
					, Tony Jon											
		CHIEF, (CONTRA	CTING, A	Aaron Sanf	ord										
		CHIEF, PM-PB, xxxx														
		CHIEF, D	PM, Joh	n Peuke	rt											

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: NESP Horse Island

LOCATION: Kaskaskia, Illinois
This Estimate reflects the scope and schedule in report;

Horse Island PIR Report

DISTRICT: St. Louis District

POC: CHIEF, COST ENGINEERING, Drew Collins

PREPARED: 3/17/2025

Civil	Norks Work Breakdown Structure		ESTIMAT	ED COST				FIRST COS Dollar Basi			TOTAL PROJEC	CT COST (FULLY F	FUNDED)	
			nate Prepare ive Price Lev	el:	17-Mar-25 1-Oct-24		m Year (Buo ve Price Lev		2026 1 OCT 25					
WBS <u>NUMBER</u> A	Civil Works Feature & Sub-Feature Description B CONTRACT 1 - Ridge & Swale	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL _(\$K)_ <i>F</i>	ESC (%) G	COST (\$K) <i>H</i>	CNTG (\$K)	TOTAL _(\$K)_ 	Mid-Point <u>Date</u> P	INFLATED(%)	COST (\$K) M	CNTG _(\$K) N	FULL (\$K) 0
	FISH & WILDLIFE FACILITIES	\$7,671	\$2,822	36.8%	\$10,493	2.7%	\$7,878	\$2,898	\$10,777	2028Q2	6.0%	\$8,348	\$3,071	\$11,419
	CONSTRUCTION ESTIMATE TOTALS:	\$7,671	\$2,822	36.8%	\$10,493	-	\$7,878	\$2,898	\$10,777			\$8,348	\$3,071	\$11,419
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$192	\$35	18.1%	\$226	3.1%	\$198	\$36	\$234	2026Q3	1.5%	\$201	\$36	\$237
0.5%	Planning & Environmental Compliance	\$38	\$7	18.1%	\$45	3.1%	\$40	\$7	\$47	2026Q3	1.5%	\$40	\$7	\$47
10.5%	Engineering & Design	\$805	\$146	18.1%	\$951	3.1%	\$830	\$150	\$981	2026Q3	1.5%	\$843	\$153	\$996
0.5%	Reviews, ATRs, IEPRs, VE	\$38	\$7	18.1%	\$45	3.1%	\$40	\$7	\$47	2026Q3	1.5%	\$40	\$7	\$47
0.5%	Life Cycle Updates (cost, schedule, risks)	\$38	\$7	18.1%	\$45	3.1%	\$40	\$7	\$47	2026Q3	1.5%	\$40	\$7	\$47
0.5%	Contracting & Reprographics	\$38	\$7	18.1%	\$45	3.1%	\$40	\$7	\$47	2026Q3	1.5%	\$40	\$7	\$47
2.0%	Engineering During Construction	\$153	\$28	18.1%	\$181	3.1%	\$158	\$29	\$187	2028Q3	7.9%	\$171	\$31	\$202
0.5% 0.0%	Planning During Construction Adaptive Management & Monitoring	\$38 \$0	\$7 \$0	18.1% 18.1%	\$45 \$0	3.1% 0.0%	\$40 \$0	\$7 \$0	\$47 \$0	2028Q3 0	7.9% 0.0%	\$43	\$8 \$0	\$50
0.0%	Project Operations	\$0 \$38	\$0 \$7	18.1%	\$0 \$45	3.1%	\$40	\$0 \$7	\$0 \$47	2026Q3	1.5%	\$0 \$40	\$0 \$7	\$0 \$47
31	CONSTRUCTION MANAGEMENT													
7.5%		\$575	\$68	11.9%	\$644	3.1%	\$593	\$71	\$664	2028Q3	7.9%	\$640	\$76	\$716
1.0%	Project Operation:	\$373 \$77	\$9	11.9%	\$86	3.1%	\$79	\$9	\$88	2028Q3 2028Q3	7.9%	\$85	\$70 \$10	\$710 \$96
1.5%	Project Management	\$115	\$14	11.9%	\$129	3.1%	\$119	\$14	\$133	2028Q3	7.9%	\$128	\$15	\$143
	CONTRACT COST TOTALS:	\$9,819	\$3,163		\$12,982	<u> </u>	\$10,093	\$3,250	\$13,343			\$10,660	\$3,437	\$14,096

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

NESP Horse Island PROJECT:

LOCATION: Kaskaskia, Illinois

Horse Island PIR Report This Estimate reflects the scope and schedule in report;

DISTRICT: St. Louis District

PREPARED: 3/17/2025

POC: CHIEF, COST ENGINEERING, Drew Collins

Civil V	Works Work Breakdown Structure		ESTIMAT	ED COST			PROJECT (Constant	FIRST COS Dollar Basis			TOTAL PROJE	CT COST (FULLY F	FUNDED)	
			nate Prepared ive Price Lev		17-Mar-25 1-Oct-24		n Year (Bud ve Price Lev		2026 1 OCT 25					
WBS <u>NUMBER</u> A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG _(\$K) 	CNTG _(%) <i>E</i>	TOTAL _(\$K) <i>F</i>	ESC (%) G	COST (\$K) <i>H</i>	CNTG (\$K)	TOTAL _(\$K) 	Mid-Point <u>Date</u> P	INFLATED _(%) _L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	CONTRACT 2 - Tree Plantings FISH & WILDLIFE FACILITIES	\$2,635	\$969	36.8%	\$3,604	2.7%	\$2,706	\$996	\$3,702	2030Q2	11.5%	\$3,019	\$1,111	\$4,129
	CONSTRUCTION ESTIMATE TOTALS:	\$2,635	\$969	36.8%	\$3,604	-	\$2,706	\$996	\$3,702			\$3,019	\$1,111	\$4,129
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$66	\$12	18.1%	\$78	3.1%	\$68	\$12	\$80	2026Q3	1.5%	\$69	\$12	\$81
0.5%	Planning & Environmental Compliance	\$13	\$2	18.1%	\$16	3.1%	\$14	\$2	\$16	2026Q3	1.5%	\$14	\$2	\$16
10.5%	Engineering & Design	\$277	\$50	18.1%	\$327	3.1%	\$285	\$52	\$337	2026Q3	1.5%	\$290	\$52	\$342
0.5%	Reviews, ATRs, IEPRs, VE	\$13	\$2	18.1%	\$16	3.1%	\$14	\$2	\$16	2026Q3	1.5%	\$14	\$2	\$16
0.5%	Life Cycle Updates (cost, schedule, risks)	\$13	\$2	18.1%	\$16	3.1%	\$14	\$2	\$16	2026Q3	1.5%	\$14	\$2	\$16
0.5%	Contracting & Reprographics	\$13	\$2	18.1%	\$16	3.1%	\$14	\$2	\$16	2026Q3	1.5%	\$14	\$2	\$16
2.0%	Engineering During Construction	\$53	\$10	18.1%	\$62	3.1%	\$54	\$10	\$64	2030Q2	13.8%	\$62	\$11	\$73
0.5%	Planning During Construction	\$13	\$2	18.1%	\$16	3.1%	\$14	\$2	\$16	2030Q2	13.8%	\$15	\$3	\$18
0.0%	Adaptive Management & Monitoring	\$0	\$0	18.1%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0 \$2	\$0
0.5%	Project Operations	\$13	\$2	18.1%	\$16	3.1%	\$14	\$2	\$16	2026Q3	1.5%	\$14	\$2	\$16
31	CONSTRUCTION MANAGEMENT													
7.5%	Construction Management	\$198	\$24	11.9%	\$221	3.1%	\$204	\$24	\$228	2030Q2	13.8%	\$232	\$28	\$260
1.0%	Project Operation:	\$26	\$3	11.9%	\$29	3.1%	\$27	\$3	\$30	2030Q2	13.8%	\$31	\$4	\$35
1.5%	Project Management	\$40	\$5	11.9%	\$44	3.1%	\$41	\$5	\$46	2030Q2	13.8%	\$46	\$6	\$52
	CONTRACT COST TOTALS:	\$3,373	\$1,087		\$4,459		\$3,467	\$1,116	\$4,583			\$3,833	\$1,239	\$5,071

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

NESP Horse Island PROJECT:

LOCATION: Kaskaskia, Illinois This Estimate reflects the scope and schedule in report;

Horse Island PIR Report

DISTRICT: St. Louis District

POC: CHIEF, COST ENGINEERING, Drew Collins

PREPARED:

3/17/2025

Civil	Works Work Breakdown Structure		ESTIMAT	ED COST				FIRST COS Dollar Basis			TOTAL PROJEC	CT COST (FULLY F	UNDED)	
			nate Prepared ve Price Lev		17-Mar-25 1-Oct-24		m Year (Buo ve Price Lev		2026 1 OCT 25					
WBS <u>NUMBER</u> A	Civil Works Feature & Sub-Feature Description B CONTRACT 3 - FSI	COST (\$K) C	CNTG _(\$K) 	CNTG _(%)_ <i>E</i>	TOTAL _(\$K)_ F	ESC (%) G	COST (\$K) <i>H</i>	CNTG (\$K)	TOTAL (\$K) J	Mid-Point <u>Date</u> P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
06	FISH & WILDLIFE FACILITIES	\$2,273	\$836	36.8%	\$3,109	2.7%	\$2,334	\$859	\$3,194	2029Q2	8.7%	\$2,538	\$934	\$3,47
	CONSTRUCTION ESTIMATE TOTALS:	\$2,273	\$836	36.8%	\$3,109		\$2,334	\$859	\$3,194			\$2,538	\$934	\$3,472
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$57	\$10	18.1%	\$67	3.1%	\$59	\$11	\$69	2026Q3	1.5%	\$59	\$11	\$7
0.5%	Planning & Environmental Compliance	\$11	\$2	18.1%	\$13	3.1%	\$12	\$2	\$14	2026Q3	1.5%	\$12	\$2	\$1
10.5%	Engineering & Design	\$239	\$43	18.1%	\$282	3.1%	\$246	\$45	\$291	2026Q3	1.5%	\$250	\$45	\$29
0.5%	Reviews, ATRs, IEPRs, VE	\$11	\$2	18.1%	\$13	3.1%	\$12	\$2	\$14	2026Q3	1.5%	\$12	\$2	\$1
0.5%	Life Cycle Updates (cost, schedule, risks)	\$11	\$2	18.1%	\$13	3.1%	\$12	\$2	\$14	2026Q3	1.5%	\$12	\$2	\$1
0.5%	3 1 3 1	\$11	\$2	18.1%	\$13	3.1%	\$12	\$2	\$14	2026Q3	1.5%	\$12	\$2	\$1
2.0%	3 3 3 -	\$45	\$8	18.1%	\$54	3.1%	\$47	\$8	\$55	2029Q2	10.4%	\$52	\$9	\$6
0.5%	0 0	\$11	\$2	18.1%	\$13	3.1%	\$12	\$2	\$14	2029Q2	10.4%	\$13	\$2	\$1
0.0%	1 3	\$0	\$0	18.1%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$
0.5%	Project Operations	\$11	\$2	18.1%	\$13	3.1%	\$12	\$2	\$14	2026Q3	1.5%	\$12	\$2	\$1
31	CONSTRUCTION MANAGEMENT													
7.5%	Construction Management	\$170	\$20	11.9%	\$191	3.1%	\$176	\$21	\$197	2029Q2	10.4%	\$194	\$23	\$21
1.0%	Project Operation:	\$23	\$3	11.9%	\$25	3.1%	\$23	\$3	\$26	2029Q2	10.4%	\$26	\$3	\$2
1.5%	Project Management	\$34	\$4	11.9%	\$38	3.1%	\$35	\$4	\$39	2029Q2	10.4%	\$39	\$5	\$4
	CONTRACT COST TOTALS:	\$2,909	\$938		\$3,847		\$2,991	\$963	\$3,954			\$3,230	\$1,043	\$4,273

NESP Horse Island Alternative Estimate Maximum Alternative

Feasibility (Recommended Plan)
Abbreviated Risk Analysis

Meeting Date: 17-Mar-25

e			Risk Level			
Very Likely	2	3	4	5	5	
Likely	1	2	3	4	5	İ
Possible	0	1	2	3	4	
Unlikely	0	0	1	2	3	
	Negligible	Marginal	Moderate	Significant	Critical	

Risk Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Ma	nagement & Scope Growth			Maximum Proje	ct Growth	40%
PS-1	Mobilization & Demobilization	Potential for scope growth, added features?	If construction features are reduced or changed, total equipment needed for mob & demob could change.	Moderate	Possible	2
PS-2	Staging	Potential for scope growth, added features? Project accomplishes intent?	Site work currently covers staging areas. Will need to be determined if access roads are necessary to get to tree planting areas and ridge/swale areas. Additional discussions are needed to determine if potential access roads would be temporary or permanent. Staging area size could be reduced if ridge/swale areas are reduced.	Significant :	Possible	3
PS-3	Ridges & Swales	Potential for scope growth, added features? Project accomplishes intent?	Ridge and swale areas could be reduced. However, if the amount of material from the swales is not sufficient to cover proposed ridge areas, there is potential for offsite borrow to be needed. Potential for ridge area/swales to be damaged during a high water event which would increase quantity of material needed to construct ridges.	Significant	Possible	3
PS-4	Tree Planting	Potential for scope growth, added features?	Potential for more trees than originally planned due to a potential high water event or drought during planting season. This would result in a significant impact as there is high quantitiy of trees to be planted.	Significant	Possible	3
PS-5	Forest Stand Improvement	Potential for scope growth, added features?	Potential for more trees than originally planned due to a potential high water event or drought during planting season. This would result in a significant impact as there is high quantitiy of trees to be planted.	Significant	Possible	3
PS-6	Wetland Restoration	Potential for scope growth, added features?	Potential for more trees than originally planned due to a potential high water event or drought during planting season. This would result in a significant impact as there is high quantitiy of trees to be planted.	Significant	Possible	3
PS-13	Planning, Engineering, & Design	Potential for scope growth, added features?	Team is currently operating on outdated terrain data. A new LiDAR survey will be performed during PED. However, the new LiDAR data could change quantities/design of current features which could increase PED costs.	Moderate	Possible	2
PS-14	Construction Management	No concerns.	No concerns.	Negligible	Unlikely	0
<u>Acquisition</u>	1 Strategy			Maximum Proje	ct Growth	30%
AS-1	Mobilization & Demobilization	Contracting plan firmly established?	MVS acquisition per Contracting Division is typically to award as 8a or small business for non-complex contracts unless they require a specialty contractor. The total dollar amount of this project is over the set aside threshold, therfore, there should be competition during bidding.	Marginal	Possible	1

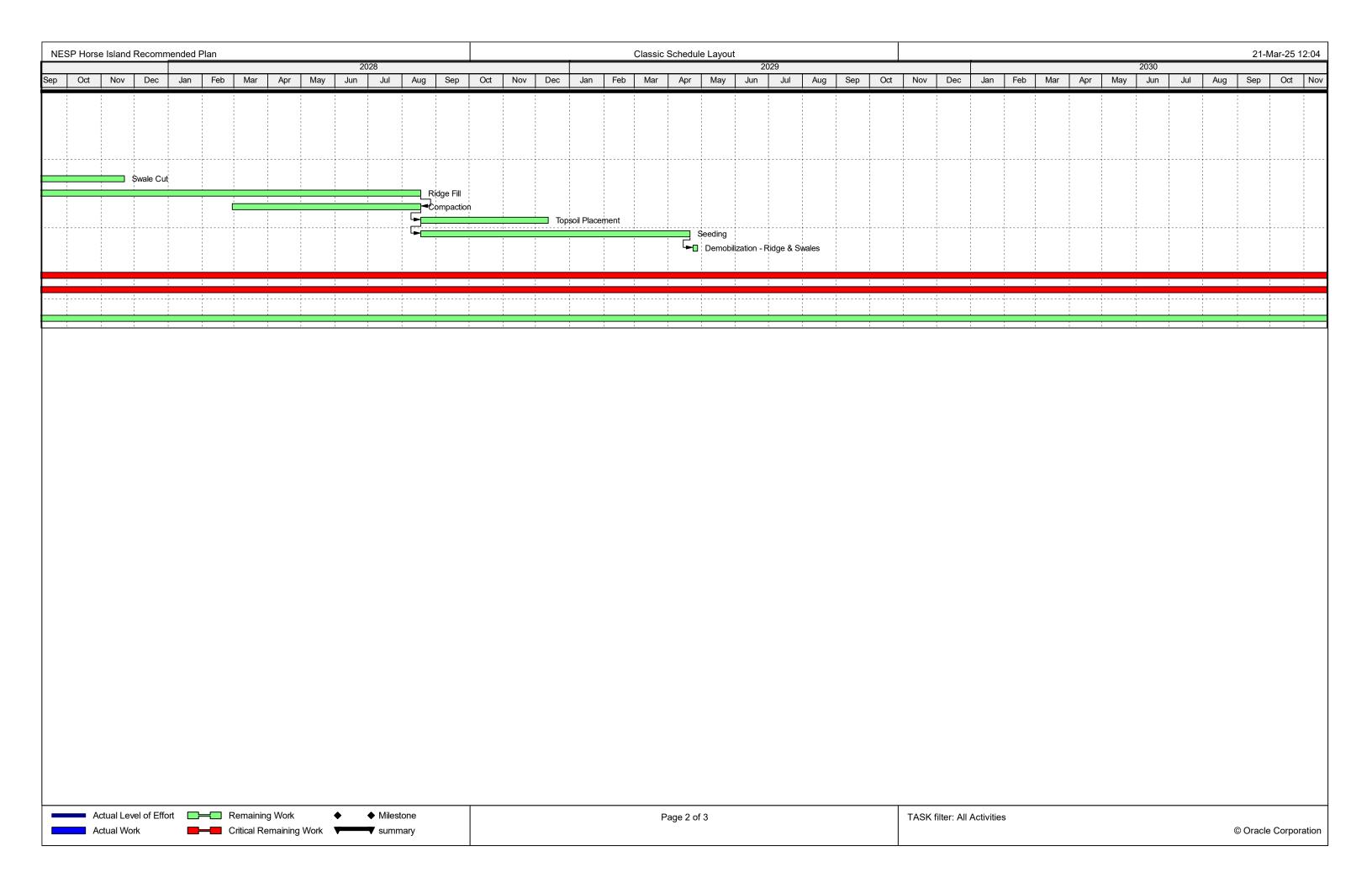
AS-2	Staging	Contracting plan firmly established?	MVS acquisition per Contracting Division is typically to award as 8a or small business for non-complex contracts unless they require a specialty contractor. The total dollar amount of this project is over the set aside threshold, therfore, there should be competition during bidding.	Marginal	Possible	1
AS-3	Ridges & Swales	Contracting plan firmly established?	MVS acquisition per Contracting Division is typically to award as 8a or small business for non-complex contracts unless they require a specialty contractor. The total dollar amount of this project is over the set aside threshold, therfore, there should be competition during bidding.	Marginal	Possible	1
AS-4	Tree Planting	Contracting plan firmly established?	MVS acquisition per Contracting Division is typically to award as 8a or small business for non-complex contracts unless they require a specialty contractor. The total dollar amount of this project is over the set aside threshold, therfore, there should be competition during bidding.	Marginal	Possible	1
AS-5	Forest Stand Improvement	Contracting plan firmly established?	MVS acquisition per Contracting Division is typically to award as 8a or small business for non-complex contracts unless they require a specialty contractor. The total dollar amount of this project is over the set aside threshold, therfore, there should be competition during bidding.	Marginal	Possible	1
AS-6	Wetland Restoration	Contracting plan firmly established?	MVS acquisition per Contracting Division is typically to award as 8a or small business for non-complex contracts unless they require a specialty contractor. The total dollar amount of this project is over the set aside threshold, therfore, there should be competition during bidding.	Marginal	Possible	1
AS-13	Planning, Engineering, & Design	Contracting plan firmly established?	Acquisition Strategy won't impact design	Negligible	Unlikely	0
AS-14	Construction Management	Contracting plan firmly established?		Negligible	Unlikely	0
			Acquisition Strategy won't impact construction management			
Constructi	ion Elements		Acquisition Strategy won't impact construction management	Maximum Proje	ct Growth	15%
Constructi	ion Elements Mobilization & Demobilization	Accelerated schedule or harsh weather schedule?	Acquisition Strategy won't impact construction management Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a potentially accelerated schedule	Maximum Proje Moderate	ct Growth Possible	15%
		Accelerated schedule or harsh weather schedule? Accelerated schedule or harsh weather schedule?	Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a			
CON-1	Mobilization & Demobilization		Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a potentially accelerated schedule Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a	Moderate	Possible	2
CON-1	Mobilization & Demobilization Staging	Accelerated schedule or harsh weather schedule?	Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a potentially accelerated schedule Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a potentially accelerated schedule Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to work during spring/summer months due to high water causing a	Moderate Moderate	Possible Possible	2

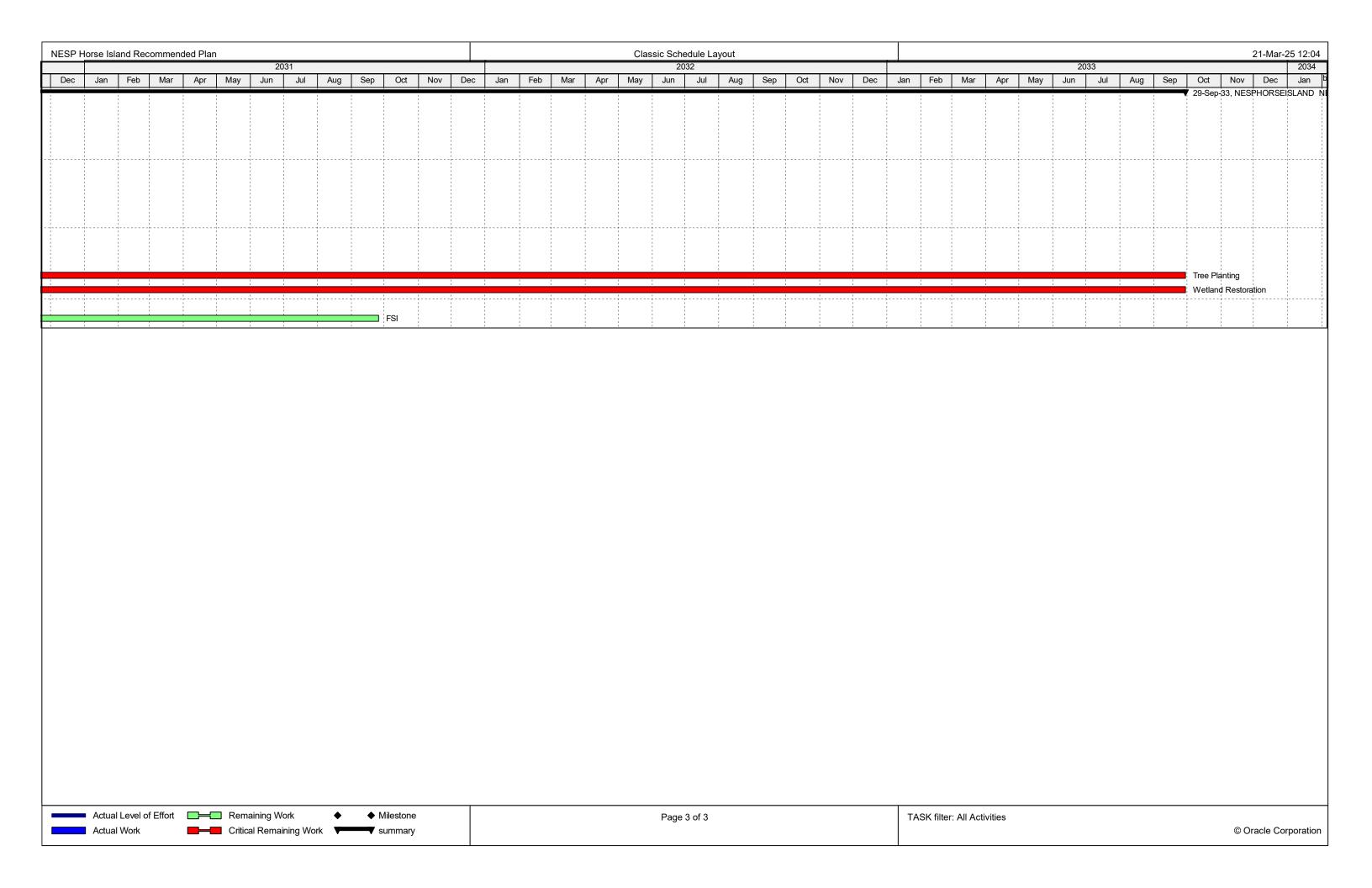
CE-6	Wetland Restoration	Accelerated schedule or harsh weather schedule?	Work will likely have to be constructed in the winter months. Project site is not in a protected area, therefore, it will difficult to wrok during spring/summer months due to high water causing a potentially accelerated schedule. An additional schedule constraint is wild life restrictions causing work to be accomplished primarily during the winter months.	Moderate	Possible	2		
CE-13	Planning, Engineering, & Design	No concerns.	No concerns.	Negligible	Unlikely	0		
CE-14	Construction Management	No concerns.	No concerns.	Negligible	Unlikely	0		
Specialty (alty Construction or Fabrication Maximum Project Growth							
SC-1	Mobilization & Demobilization	No concerns.		Negligible	Unlikely	0		
SC-2	Staging	No concerns.		Negligible	Unlikely	0		
SC-3	Ridges & Swales	No concerns.		Negligible	Unlikely	0		
SC-4	Tree Planting	No concerns.		Negligible	Unlikely	0		
SC-5	Forest Stand Improvement	No concerns.		Negligible	Unlikely	0		
SC-6	Wetland Restoration	No concerns.		Negligible	Unlikely	0		
SC-13	Planning, Engineering, & Design	No concerns.		Negligible	Unlikely	0		
SC-14	Construction Management	No concerns.		Negligible	Unlikely	0		
Technical	Design & Quantities	ntities Maximum Project Growth						
T-1	Mobilization & Demobilization	• Level of confidence based on design and assumptions?	If construction features are reduced or changed, total equipment needed for mob & demob could change.	Moderate	Possible	2		
T-2	Staging	* Level of confidence based on design and assumptions?	Site work currently covers staging areas. Will need to be determined if access roads are necessary to get to tree planting areas and ridge/swale areas. Additional discussions are needed to determine if potential access roads would be temporary or permanent.	Significant	Possible	3		
T-3	Ridges & Swales	* Level of confidence based on design and assumptions?	Ridges and swales quantities did not have a contingency applied to the quantitiy. Need to consider factors for swell/compaction when transporting material. Quantity could change once updated surveys are completed	Significant	Possible	3		
T-4	Tree Planting	PDT has no concerns on quantity development. PDT feels that tree planting will not increase or decrease as design progresses.		Negligible	Unlikely	0		
T-5	Forest Stand Improvement	PDT has no concerns on quantity development. PDT feels that tree planting will not increase or decrease as design progresses.		Negligible	Unlikely	0		
T-6	Wetland Restoration	PDT has no concerns on quantity development. PDT feels that tree planting will not increase or decrease as design progresses.		Negligible	Unlikely	0		

T-13	Planning, Engineering, & Design	No concerns.		Negligible	Unlikely	0
T-14	Construction Management	No concerns.		Negligible	Unlikely	0
Cost Estim	ate Assumptions	Maximum Proje	25%			
EST-1	Mobilization & Demobilization	Assumptions regarding crew, productivity, overtime?	If construction features are reduced or changed, total equipment needed for mob & demob could change.	Marginal	Likely	2
EST-2	Staging	Site accessibility, transport delays, congestion?	Estimate doesn't currently have items for site access incorporated other than a few low water crossings. This could be a significant change in assumptions if access roads are required and it would need to be determined how access roads should be designed and if they will be permanent or temporary	Significant	Possible	3
EST-3	Ridges & Swales	Assumptions regarding crew, productivity, overtime? Site accessibility, transport delays, congestion?	It is assumed that this work will be done by 2 crews consisting of hydraulic excavators and dozers. If the contractor decides to use more crews/equipment, the unit cost could increase. It is also assumed that dozers can transport material from swale excavation directly to ridge fill areas without the need for access roads or clearing and grubbing. If either is necessary, costs could increase significantly	Significant	Possible	3
EST-4	Tree Planting	Assumptions regarding crew, productivity, overtime?	Costs were provided from environmental and rivers project office USACE forester. PDT feels assumptions used in determining these costs are accurate and unlikley to change as design progresses. Estimate assumes a separate contract for tree planting. The mob costs are included in the labor rate provided from environmental, however, it is undetermined at this time how many mob/demobs would be necessary to accomplish the planting over a long contract period.	Marginal	Possible	1
EST-5	Forest Stand Improvement	Assumptions regarding crew, productivity, overtime?	Costs were provided from environmental and rivers project office USACE forester. PDT feels assumptions used in determining these costs are accurate and unlikley to change as design progresses. Estimate assumes a separate contract for FSI. The mob costs are included in the labor rate provided from environmental, however, it is undetermined at this time how many mob/demobs would be necessary to accomplish the planting over a long contract period.	Marginal	Possible	1
EST-6	Wetland Restoration	Assumptions regarding crew, productivity, overtime?	Costs were provided from environmental and rivers project office USACE forester. PDT feels assumptions used in determining these costs are accurate and unlikley to change as design progresses. Estimate assumes a separate contract for wetland restoration. The mob costs are included in the labor rate provided from environmental, however, it is undetermined at this time how many mob/demobs would be necessary to accomplish the planting over a long contract period.	Marginal	Possible	1
EST-13	Planning, Engineering, & Design		Estimate assumes historical MVS PED percentages. PED will need to be scoped out as design progresses.	Marginal	Possible	1
EST-14	Construction Management		Estimate assumes historical MVS CM percentages. CM will need to be scoped out as design progresses.	Marginal	Possible	1

External Pr	roject Risks			Maximum Projec	ct Growth	20%
EX-1	Mobilization & Demobilization	Potential for Severe Adverese Weather?	Adversse weather could effect the contract duration impacting the overall cost of construction. Escalation of material costs and labor rates would increase overall costs.	Moderate	Possible	2
EX-2	Staging	Potential for Severe Adverese Weather?	Adversse weather could effect the contract duration impacting the overall cost of construction. Escalation of material costs and labor rates would increase overall costs.	Moderate	Possible	2
EX-3	Ridges & Swales	Potential for Severe Adverese Weather?	Adversse weather could effect the contract duration impacting the overall cost of construction. Escalation of material costs and labor rates would increase overall costs.	Moderate	Possible	2
EX-4	Tree Planting	Potential for Severe Adverese Weather?	Adversse weather could effect the contract duration impacting the overall cost of construction. Escalation of material costs and labor rates would increase overall costs. Supply chain issues could make it difficult to acquire the number of trees necessary to complete this feature. Additionally, an icnrease in cost per tree could significantly raise the total project cost.	Significant	Possible	3
EX-5	Forest Stand Improvement	Potential for Severe Adverese Weather?	Adversse weather could effect the contract duration impacting the overall cost of construction. Escalation of material costs and labor rates would increase overall costs. Supply chain issues could make it difficult to acquire the number of trees necessary to complete this feature. Additionally, an icnrease in cost per tree could significantly raise the total project cost.	Significant	Possible	3
EX-6	Wetland Restoration	Potential for Severe Adverese Weather?	Adversse weather could effect the contract duration impacting the overall cost of construction. Escalation of material costs and labor rates would increase overall costs. Supply chain issues could make it difficult to acquire the number of trees necessary to complete this feature. Additionally, an icnrease in cost per tree could significantly raise the total project cost.	Significant	Possible	3
EX-13	Planning, Engineering, & Design	Political Influences, lack of support, obstacles? Potential for Severe Adverse weather?	If archaelogical surveys reveal sensitive area then design will have to work around cultural area. The impact will be moderate but chance is unlikely. Initial cultrual survey indicated a very low risk of finding culutrually sensitive items as the project site is located on the historic Mississippi riverbed.	Moderate	Unlikely	1
EX-14	Construction Management	No concerns.		Negligible	Unlikely	0

# A	Activity ID Activity Name Orig		Origina		Finish						2	026									2	:027			
		Duratio		וו		Dec	Jan F	eb l	/lar Api	r May	Jun	Jul	Aug	Sep	Oct	Nov De	ec .	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
	NESPHO	RSEISLAND NESP Horse Island Recommended PI	2020	02-Jan-26	29-Sep-33	,		:	:		1	!	:	:	:		:	:	1	:		:	:		
2	A 1000	Engineering and Design	194	02-Jan-26	30-Sep-26			_			-				Engine	ering and Desi	jn :	:	1	1		: : :	:		:
3	A 1010	Contract 1 Award - Ridge & Swales	1	01-Oct-26	01-Oct-26			:	:	1	1 1	:	:	•	Contra	ct 1 Award - Rid	lge & S	wales	:	1		: : :	:		:
1	A 1020	Mobilization - Ridge & Swales	5	13-Nov-26	19-Nov-26							1				Mobiliz	ation - F	Ridge &	Swales	1		1			
5	A 1030	Staging Area/Access	6	20-Nov-26	27-Nov-26					i	1	1				Stag	ing Area	a/Acces	s	1		: : :	1		
6	A 1035	Strippping	127	27-Nov-26	25-May-27	1										-							Stripppin	9	
7	A 1040	Swale Cut	129	25-May-27	22-Nov-27							1			i				i !	i		-			
3	A 1050	Ridge Fill	323	25-May-27	18-Aug-28							1						:		1		└ ►■			-
9	A 1060	Compaction	124	28-Feb-28	18-Aug-28			:	:		1	:	:	:	:			:	:	1		:	:		:
0	A 1065	Topsoil Placement	82	18-Aug-28	12-Dec-28					:		:			1			:	:			:	:		
1	A 1070	Seeding	176	18-Aug-28	20-Apr-29								- I	!	; ;							*			
2	A 1075	Demobilization - Ridge & Swales	5	23-Apr-29	27-Apr-29			:	:	:	1 1	1		:	:		:	:	:	1		: :	:		
3	A 1080	Contract 2 Award - Tree Planting/Wetland Restoration	1	01-Oct-26	01-Oct-26			i	1	1		1		•	Contra	ct 2 Award - Tre	e Planti	ing/Wetl	land Rest	to ration		1			
4	A 1085	Tree Planting	1825	02-Oct-26	29-Sep-33				!		1	1		•		1 1	,		1	1	1	1	1		-
5	A1090	Wetland Restoration	1825	02-Oct-26	29-Sep-33						1	1	1	ļ -						1					_
6	A 1095	Contract 3 Award - FSI	1	01-Oct-26	01-Oct-26				-				-j	ļL	Contra	ct 3 Award - FS	i i						; !		
7	A1100	FSI	1300	02-Oct-26	25-Sep-31				1	1	1	1		G.						-					÷





Minimum 2 4/3/2025

ITEM	ESTIMATED AMOUNT	١
Mobilization and Demobilization	\$500,0	00
Site Work		
Geotextile	\$7,0	00
Aggregate	\$17,0	00
Ridges & Swales	\$6,211,0	00
Tree Planting	\$530,0	00
Seeding	\$870,0	00
SUI	BTOTAL: \$8,135,00	0
Conti	ingency: \$2,359,00	0
SUI	BTOTAL: \$10,494,00	0
	E & D \$1,574,00	0
	S & A \$1,049,00	0

TOTAL COST: \$13,117,000

Intermediate 1 4/3/2025

ITEM		ESTIMATED AMOUNT	
Mobilization and Demobilization		\$500,000	
Site Work			
Geotextile		\$7,000	
Aggregate		\$17,000	
Ridges & Swales		\$6,211,000	
Tree Planting		\$530,000	
Forest Stand Improvement		\$880,000	
Seeding		\$870,000	
	SUBTOTAL:	\$9,015,000	
	Contingency:	\$2,614,000	299
	SUBTOTAL:	\$11,629,000	
	E & D	\$1,744,000	159
	S & A	\$1,163,000	109

TOTAL FIRST COST: \$14,536,000

4/3/2025 Intermediate 2

	ESTIMATED	
ITEM	AMOUNT	
Mobilization and Demobilization	\$500,000	
Site Work		
Geotextile	\$7,000	
Aggregate	\$17,000	
Ridges & Swales	\$6,211,000	
Tree Planting	\$1,230,000	
Forest Stand Improvement	\$620,000	
Wetland Restoration	\$40,000	
Seeding	\$1,020,000	
SUBTOTAL:	\$9,645,000	
Contingency:	\$2,797,000	29
SUBTOTAL:	\$12,442,000	
E & D	\$1,866,000	15
S & A	\$1,244,000	10

TOTAL FIRST COST: \$15,552,000

4/3/2025 Intermediate 3

	ESTIMATED
ITEM	AMOUNT
Mobilization and Demobilization	\$500,000
Site Work	
Geotextile	\$6,000
Aggregate	\$15,000
Ridges & Swales	\$7,810,000
Tree Planting	\$1,240,000
Forest Stand Improvement	\$900,000
Wetland Restoration	\$80,000
Seeding	\$1,020,000
SUBTOTAL:	\$11,571,000
Contingency:	\$3,356,000
SUBTOTAL:	\$14,927,000
E & D	\$2,239,000
S & A	\$1,493,000

TOTAL FIRST COST: \$18,659,000

Maximum 4/3/2025

ITEM	ESTIMATED AMOUNT
Mobilization and Demobilization	\$500,000
Site Work	
Geotextile	\$7,000
Aggregate	\$17,000
Ridges & Swales	\$8,564,000
Tree Planting	\$1,240,000
Forest Stand Improvement	\$1,280,000
Wetland Restoration	\$250,000
Seeding	\$1,250,000
SUBTOTAL:	\$13,108,000
Contingency:	\$3,801,000
SUBTOTAL:	\$16,909,000
E & D	\$2,536,000
S & A	\$1,691,000

TOTAL FIRST COST:

\$21,136,000

Appendix H – Economics

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	ncremental Costs (AAHUs)	
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Local, State, and National	Impacts: Intermediate 2	10
Local, State, and National	Impacts: Intermediate 3	11
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1. Cost Effective and Incremental Cost Analyses

1.1 INTRODUCTION

For environmental planning, where traditional benefit-cost analysis is not possible because costs and benefits are expressed in different units, two analytical methods are used to assist Corps planners in the decision process. First, cost effectiveness (CE) analysis is conducted to ensure that the least cost solution is identified for each possible level of environmental output. Subsequent incremental cost analysis (ICA) of the cost-effective solutions is conducted to reveal changes in costs for increasing levels of environmental outputs. In the absence of a common measurement unit for comparing the non-monetary benefits with the monetary costs of environmental plans, cost effectiveness and incremental cost analysis are valuable tools to assist in decision making.

It is important to keep in mind that the most useful information developed by these two methods is what it tells decision makers about the relative relationships among solutions – that one will likely produce greater output than another, or one is likely to be more costly than another – rather than the specific numbers that are calculated. Furthermore, these analyses will usually not lead, and are not intended to lead, to a single best solution (as in economic cost-benefit analysis); however, they will improve the quality of decision making by ensuring that a rational, supportable approach is used in considering and selecting alternative methods to produce environmental outputs.

To perform the CE/ICA, use was made of the IWR Planning Suite Decision Support Software developed by the US Army Corps of Engineers Institute for Water Resources (IWR). IWR Planning Suite has been developed to assist with plan comparison by conducting cost effectiveness and incremental cost analyses, identifying the plans which are the best financial investments ("Best Buys"), and displaying the effects of each on a range of decision variables. The software is available via the IWR Planning Suite Internet. The latest version (2.0.9.35) has been certified for use by USACE Headquarters, meaning that it has been reviewed and certified by the appropriate Planning Center of Expertise (PCX) and represents a corporate approval that the model is sound and functional.

1.2 COST EFFECTIVE SOLUTIONS (CE)

In cost effectiveness analysis, it is necessary to filter out plans that produce the same output level as another plan but cost more; or cost the same amount or more than another plan but produce less output. This CE analysis was performed by the IWR planning model.

Table 1 displays the expected environmental outputs in terms of average annual habitat units along with the total first cost, interest during construction, and total average annual cost for each of the restoration alternatives and No Action plans. In this instance all Alternatives are cost effective.

1.3 COST EFFECTIVE AND INCREMENTALLY JUSTIFIED (BEST BUY PLANS)

The final step in the analysis is to determine which subset of the cost-effective solutions is also incrementally justified. These solutions, also known as Best Buy Plans or Best Buy Alternatives, are those plans that provide increases in benefits at the lowest average cost per habitat unit. **Table 2** shows the incremental cost per habitat unit for only Alternative Maximum which is the Best Buy Plan (the No Action alternative is always, by default, a Best Buy Plan). **Table 3** shows the incremental costs per habitat unit for all cost-effective plans not chosen as well as for the Best Buy Plan Alternative Maximum.

Incremental cost is calculated by dividing the difference between the solution's costs by the difference between the solution's outputs. Reviewing this table with the incremental cost information now allows the decision maker to make the following comparisons of alternative restoration plans and to progressively ask "Is it worth it?"

As noted previously, neither cost effectiveness analysis nor incremental cost analysis will tell the decision maker what choice to make. However, the information developed by both analyses will help the decision maker make a more-informed decision and, once a decision is made, better understand its consequences in relation to other choices. **Figure 1** shows the full range of solutions and highlights the cost-effective solutions and the incrementally justified (Best Buy) solutions. **Figure 2** shows the incremental cost and output for the Best Buy Plans.

Table 1. Summary of Outputs (AAHUs) and Costs

Name		I	nterest	ļ	Average	4	Average	P	verage		Average		Cost Effective	
of	First Cost		During		Annual		Annual		Annual		Annual	AAHUs	or	
Alternative			Construction		Construction		O&M		M&AM		Cost		Best Buy	
No Action	\$ -	\$	-	\$		\$	-	\$	-	\$	-	-	Best Buy	
Min 2	\$ 13,117,000	\$	394,986	\$	525,150	\$	2,848	\$	6,580	\$	534,578	90.81	Cost Effective	
Int 1	\$ 14,536,000	\$	437,715	\$	581,961	\$	4,916	\$	13,309	\$	600,187	250.06	Cost Effective	
Int 2	\$ 15,552,000	\$	468,310	\$	622,637	\$	9,455	\$	24,811	\$	656,903	350.42	Cost Effective	
Int 3	\$ 18,659,000	\$	561,869	\$	747,029	\$	10,864	\$	29,406	\$	787,299	472.89	Cost Effective	
Max	\$ 21,136,000	\$	636,458	\$	846,197	\$	13,043	\$	36,536	\$	895,777	695.16	Best Buy	

Note: Costs are shown at the 2025 price level and were annualized using the current FY25 Federal discount rate of 3.0 percent over a 50-year period of analysis.

Table 2. Best Buy Plans and Incremental Costs (AAHUs)

Name of Alternative	AAHUs	First Cost	Interest During Construction		Average Annual Cost	Ann	verage ual Cost r AAHU	Δ	dditional Average Inual Cost	Additional Output (AAHUs)	Co	emental st (per AHU)
No Action	-	\$ -	\$	- \$	-	\$		\$	-	-	\$	-
Max	695.16	\$ 21,136,000	\$ 636,45	3 \$	895,777	\$	1,289	\$	895,777	695.16	\$	1,289

Note: Costs are shown at the 2025 price level and were annualized using the current FY25 Federal discount rate of 3.0 percent over a 50-year period of analysis.

Table 3. Cost Effective Plans and Incremental Costs (AAHUs)

Name of	AAHUs	First Cost		During		Average Annual Cost		Average Annual Cost per AAHU		ditional erage	Additional Output	_	emental t (per
Alternative										nual Cost	(AAHUs)	AAH	••
No Action	-	\$ -	\$	-	\$	-	\$	-	\$	-	-	\$	-
Min 2	90.81	\$ 13,117,000	\$	394,986	\$	534,578	\$	5,887	\$	534,578	90.81	\$	5,887
Int 1	250.06	\$ 14,536,000	\$	437,715	\$	600,187	\$	2,400	\$	65,608	159.25	\$	412
Int 2	350.42	\$ 15,552,000	\$	468,310	\$	656,903	\$	1,875	\$	56,717	100.36	\$	565
Int 3	472.89	\$ 18,659,000	\$	561,869	\$	787,299	\$	1,665	\$	130,396	122.47	\$	1,065
Max	695.16	\$ 21,136,000	\$	636,458	\$	895,777	\$	1,289	\$	108,478	222.27	\$	488

Note: Costs are shown at the 2025 price level and were annualized using the current FY25 Federal discount rate of 3.0 percent over a 50-year period of analysis.

Figure 1. Cost Effectiveness of Full Range of Solutions

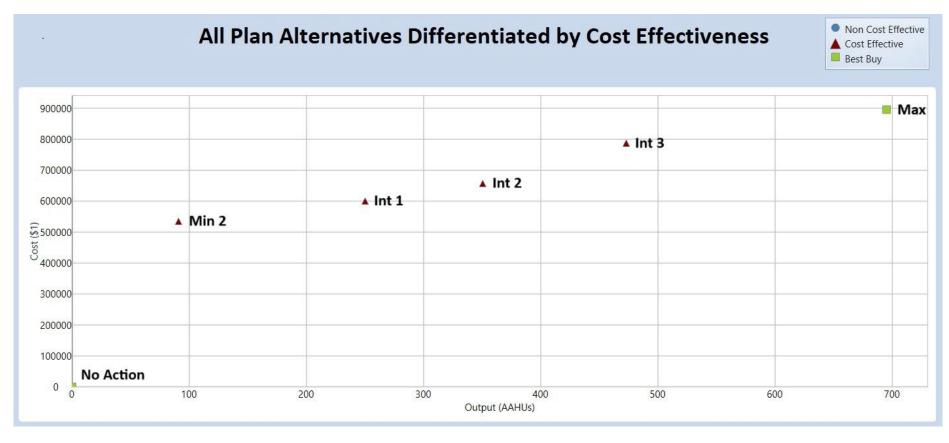
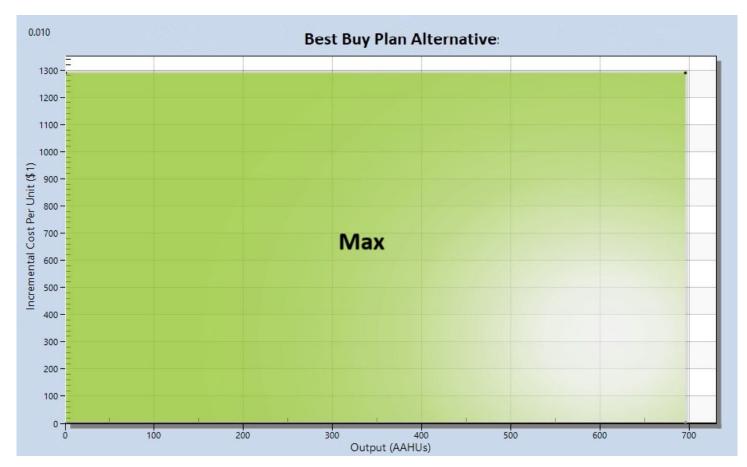


Figure 2. Incremental Cost of Best Buy Plans



2. Regional Economic Development

2.1 RECONS MODEL

The U.S. Army Corps of Engineers (USACE) Institute for Water Resources, Louis Berger, and Michigan State University have developed a regional economic impact modeling tool, RECONS (Regional ECONomic System), that provides estimates of jobs and other economic measures such as labor income, value added, and sales that are supported by USACE programs, projects, and activities. This modeling tool automates calculations and generates estimates of jobs, labor income, value added, and sales through the use of IMPLAN®'s multipliers and ratios, customized impact areas for USACE project locations, and customized spending profiles for USACE projects, business lines, and work activities. RECONS allows the USACE to evaluate the regional economic impact and contribution associated with USACE expenditures, activities, and infrastructure.

2.2 RESULTS

Table 4. Local, State, and National Impacts: Minimum 2

Area	Local Capture	Output	Jobs*	Labor Income	Value Added
Local					
Direct Impact		\$8,660,270	83.2	\$5,516,679	\$4,544,526
Secondary Impact		\$3,673,111	23.2	\$982,356	\$1,972,561
Total Impact	\$8,660,270	\$12,333,381	106.4	\$6,499,035	\$6,517,088
State					
Direct Impact		\$10,791,763	107.5	\$8,209,734	\$6,600,374
Secondary Impact		\$13,319,501	64.3	\$4,542,703	\$7,887,033
Total Impact	\$10,791,763	\$24,111,263	171.8	\$12,752,437	\$14,487,407
US					
Direct Impact		\$13,026,575	145.4	\$10,484,985	\$8,588,886
Secondary Impact		\$26,839,420	119.3	\$8,438,916	\$14,566,109
Total Impact	\$13,026,575	\$39,865,995	264.7	\$18,923,901	\$23,154,995

^{*} Jobs are presented in full-time equivalence (FTE)

Table 5. Local, State, and National Impacts: Intermediate 1

Area	Local Capture	Output	Jobs*	Labor Income	Value Added
Local					
Direct Impact		\$9,597,140	92.2	\$6,113,475	\$5,036,154
Secondary Impact		\$4,070,469	25.7	\$1,088,628	\$2,185,953
Total Impact	\$9,597,140	\$13,667,609	118.0	\$7,202,102	\$7,222,108
State					_
Direct Impact		\$11,959,218	119.2	\$9,097,864	\$7,314,404
Secondary Impact		\$14,760,407	71.2	\$5,034,134	\$8,740,254
Total Impact	\$11,959,218	\$26,719,625	190.4	\$14,131,998	\$16,054,658
US					_
Direct Impact		\$14,435,792	161.1	\$11,619,253	\$9,518,034
Secondary Impact		\$29,742,915	132.2	\$9,351,840	\$16,141,874
Total Impact	\$14,435,792	\$44,178,707	293.3	\$20,971,093	\$25,659,908

^{*} Jobs are presented in full-time equivalence (FTE)

Table 6. Local, State, and National Impacts: Intermediate 2

Area	Local Capture	Output	Jobs*	Labor Income	Value Added
Local					
Direct Impact		\$10,267,936	98.7	\$6,540,779	\$5,388,159
Secondary Impact		\$4,354,976	27.5	\$1,164,718	\$2,338,742
Total Impact	\$10,267,936	\$14,622,912	126.2	\$7,705,496	\$7,726,900
State					
Direct Impact		\$12,795,113	127.5	\$9,733,764	\$7,825,647
Secondary Impact		\$15,792,092	76.2	\$5,385,997	\$9,351,158
Total Impact	\$12,795,113	\$28,587,205	203.7	\$15,119,760	\$17,176,806
US					_
Direct Impact		\$15,444,788	172.4	\$12,431,386	\$10,183,301
Secondary Impact		\$31,821,809	141.4	\$10,005,491	\$17,270,118
Total Impact	\$15,444,788	\$47,266,597	313.8	\$22,436,877	\$27,453,418

^{*} Jobs are presented in full-time equivalence (FTE)

Table 7. Local, State, and National Impacts: Intermediate 3

Area	Local Capture	Output	Jobs*	Labor Income	Value Added
Local					
Direct Impact		\$12,319,279	118.4	\$7,847,504	\$6,464,612
Secondary Impact		\$5,225,019	33.0	\$1,397,407	\$2,805,979
Total Impact	\$12,319,279	\$17,544,298	151.4	\$9,244,911	\$9,270,591
State					
Direct Impact		\$15,351,338	153.0	\$11,678,388	\$9,389,066
Secondary Impact		\$18,947,058	91.4	\$6,462,018	\$11,219,345
Total Impact	\$15,351,338	\$34,298,396	244.4	\$18,140,407	\$20,608,412
US					
Direct Impact		\$18,530,369	206.8	\$14,914,945	\$12,217,734
Secondary Impact		\$38,179,213	169.7	\$12,004,402	\$20,720,366
Total Impact	\$18,530,369	\$56,709,583	376.5	\$26,919,347	\$32,938,100

^{*} Jobs are presented in full-time equivalence (FTE)

Table 8. Local, State, and National Impacts: Maximum

Area	Local Capture	Output	Jobs*	Labor Income	Value Added
Local					
Direct Impact		\$13,954,675	134.1	\$8,889,268	\$7,322,796
Secondary Impact		\$5,918,645	37.4	\$1,582,914	\$3,178,475
Total Impact	\$13,954,675	\$19,873,320	171.5	\$10,472,182	\$10,501,271
State					_
Direct Impact		\$17,389,243	173.3	\$13,228,706	\$10,635,474
Secondary Impact		\$21,462,298	103.5	\$7,319,858	\$12,708,724
Total Impact	\$17,389,243	\$38,851,541	276.8	\$20,548,563	\$23,344,198
US					_
Direct Impact		\$20,990,293	234.3	\$16,894,918	\$13,839,650
Secondary Impact		\$43,247,540	192.2	\$13,597,998	\$23,471,014
Total Impact	\$20,990,293	\$64,237,834	426.5	\$30,492,916	\$37,310,664

^{*} Jobs are presented in full-time equivalence (FTE)

Appendix I – Resilience Assessment

1.0 ECB 2018-14 ANALYSIS OF POTENTIAL VULNERABILITIES

This assessment is performed to highlight existing and future challenges facing the study area due to changing conditions and is conducted in accordance with United States Army Corps of Engineers' (USACE) Engineering Construction Bulletin (ECB) 2018-14, *Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs, and Projects*, revised 19 August 2022. In accordance with ECB 2018-14, this evaluation identifies potential vulnerabilities for the Navigation and Ecosystem Sustainability (NESP) Program Horse Island Project. The Horse Island Project is located on the Horse Island Division of the Middle Mississippi River National Wildlife Refuge. It is located near Kaskaskia, Illinois [between River Miles (RMs)] 113 – 111 on Kaskaskia Island. This assessment highlights existing and future risks for the study area. Detailed study background information can be found in the main report, and more general background information on risk can be found in ECB 2018-14.

2.0 STUDY BACKGROUND

The Horse Island study area is located within the Middle Mississippi River National Wildlife Refuge (Refuge). The Horse Island Division is near Kaskaskia, Illinois [Mississippi River Mile (RM) 113-111] on Kaskaskia Island. The study area comprises a total of 2,000 acres, and the current land use is approximately 20% non-forested abandoned agricultural fields, and 80% riverfront forest communities. Within the project areas, the floodplain forest communities have severely declined in extent, diversity, and resiliency due to changes in hydraulics and hydrology from the implementation and operation of the 9-foot navigation channel, land use changes, and invasive species. Ecosystem restoration is the focus of this analysis.

The objectives for the study area include:

- Primary Objective 1: Restore floodplain forest communities,
- Primary Objective 2: Restore natural hydrologic function to the floodplain by emulating natural flooding and drainage regimes, and
- Secondary Objective: Restore and enhance the quality and diversity of wetland habitat.

Figure 1 below shows the project area. Backwater from the Mississippi River inundates the project area. As water rises, first the old main channel of the Mississippi River fills in (light blue line). Next, water overtops the banks of the old main channel of the Mississippi River (black arrows), and then inundates the Horse Island area by hydraulic connection and elevation. During large events, levees can overtop, changing the flow of water through the area.

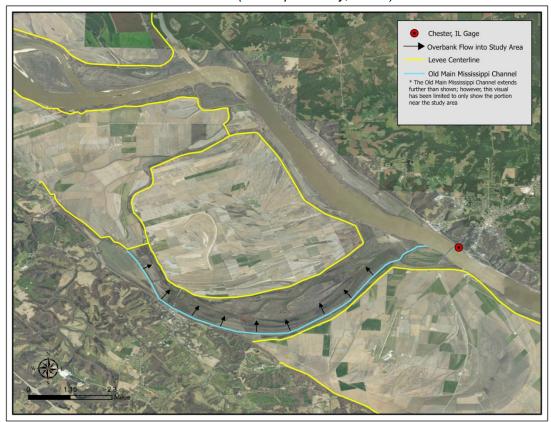


Figure 1. Study area and location map

Future conditions may impact the establishment and design of project features. As indicated by the U.S Geological Survey (USGS) in their 2022 report, *Ecological Status and Trends of the Upper Mississippi and Illinois Rivers*, hydrologic indicator variables most relevant to the ecological health of a watershed are annual discharge (maximum, mean, and minimum), duration of high discharges (exceeding the 20% annual exceedance probability (AEP) discharge), and monthly mean discharge. Thus, to analyze the effects of changing conditions on ecosystem restoration features for this study, the annual average streamflow records are evaluated since they are representative of flows impacting project features throughout the year.

3.0 LITERATURE REVIEW

The Fourth and Fifth National Climate Assessment (NAC4 and NCA15) and the USACE Civil Works Technical Report CWTS-2015-13, as well as state and watershed specific resources published by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS) are the basis for this literature review. The focus of these references is on summarizing trends in historic observed temperature, precipitation, and streamflow records, as well as providing an indication of future changed hydrology based on the outputs from Global Climate Models (GCMs). For this assessment, background on observed and projected temperature and precipitation is provided as context for the impact that they have on observed and projected streamflow.

The NCA5 (and NCA4) considers climate research at both a national and regional scale (USGCRP, 2023) (USGCRP, 2018). *Civil Works Technical Report CWTS-2015-13* was published as part of a series of regional summary reports covering peer-reviewed literature. The 2015 USACE Technical Reports cover 2-digit, United States Geological Survey (USGS)

hydrologic unit code (HUC) watersheds in the United States (U.S). The Mississippi River project areas are located in 2-digit HUC 07, the Upper Mississippi Region (USACE, 2015) and in the NCA5 (and NCA4) Midwest climate region.

In many areas, temperature, precipitation, and streamflow have been measured since the late 1800s and provide insight into how the hydrology in the study area has changed over the past century. GCMs are used in combination with different representative concentration pathways (RCPs) reflecting projected radiative forcings up to year 2100 to model future long-term weather patterns. Radiative forcings encompass the change in net radiative flux due to external drivers of long-term weather variability, such as, changes in carbon dioxide or land use/land cover. Projected temperature and precipitation results can be transformed to regional and local scales (a process called downscaling) for use as inputs in precipitation-runoff models (Graham, Andreasson, and Carlsson, 2007). Uncertainty is inherent to projections of temperature and precipitation due to the GCMs, RCPs, downscaling methods, and many assumptions needed to create projections (USGCRP, 2017). When applied, precipitation-runoff models introduce an additional layer of uncertainty. However, these methods represent the best available science to predict future hydrologic variables (e.g., precipitation, temperature, streamflow). Many researchers use multiple GCMs and RCPs in their studies to understand how various model assumptions impact results (Gleckler et al., 2008).

3.1 Temperature.

Based on observed temperature records, the annual, average air temperature between 1986 and 2016 for the Midwest has increased by 1.26°F from the 1901-1960 annual average temperature (USGCRP, 2017). Increasing temperatures can accelerate snowmelt and lengthen the frost-free season (Carelton and Hsiang, 2019; Liu, Goodrick, and Stanturf, 2013; Woodward, Perkins, and Brown, 2010). Many studies indicate a change in the seasonality in the region, marked by increasing winter temperatures and early spring melt (Schwartz, Ault, and Betancourt, 2013; Wang et al., 2009; Wolter et al., 2015; Westby, Lee, and Black, 2013). GCM based projections of temperature for the Midwest show a statistically significant increase in both annual average temperature and the number extreme heat days over the next century (Vavrus and Behnke, 2014).

In Illinois and Missouri, observed temperatures have risen almost 1.5°F and 1°F, respectively, since the beginning of the 20th century. Temperatures since 2000 have been higher than any other historical period, apart from the Dust Bowl in the early 1930s. Warming has been concentrated in the winter and spring. Summers have not warmed substantially in Illinois, and they are only slightly above long-term averages in Missouri. Both states have had a below average number of very hot days since the mid-1950s. Illinois has experienced no overall trend in very warm nights since the beginning of the 20th century, while in Missouri recent summers have experienced much higher nighttime minimum temperatures (slightly above Dust Bowl levels). Winter warming has also been characterized by a below average number of very cold nights since 1990 (¹Frankson, 2022; ²Frankson, 2022).

3.2 Precipitation.

Average, annual precipitation in the Midwest has increased by 5% to 15% from the first half of the last century (1901–1960) as compared to present day (1986–2015). The amount of rain falling in extreme rain events (1% AEP storm events), has increased by 42% from 1958 to 2016 (USGCRP, 2018). According to the NCA4, GCM based projections indicate that winter and spring precipitation in the Midwest could increase by up to 30% by the end of the century. Precipitation increases of 10-15% are projected in winter and spring for 2-digit HUC 07 from

2070–2099 relative to 1986–2015. However, in the summer and fall, projected precipitation amounts are not expected to change significantly. A northward shift in the rain–snow transition zone in the central and eastern United States is projected by end of the 21st century causing large areas that are currently snow dominated in the cold season to be rainfall dominated (USGCRP, 2017; Ning and Bradley, 2015). In addition to change in the quantity of precipitation, there has been more extreme variability with rapid shifts between wet and dry periods. These quick transitions between wet and dry periods are expected to increase by the late 21st century (USGCRP, 2023).

Recently, Illinois and Missouri have experienced an increase in the number of extreme precipitation events. Winter and spring precipitation are projected to increase, while summer precipitation may decrease. For much of the state of Missouri, more than 40% of the total annual precipitation occurs within the 10 wettest days of the year (¹Frankson, 2022). Overall, extreme precipitation events are projected to become more intense. Drought intensity is also projected to increase; rising temperatures increasing evaporation rates will facilitate longer and hotter summer droughts (¹Frankson, 2022; ²Frankson, 2022).

3.3 Streamflow.

Observed streamflow trends are strongly influenced by precipitation, temperature, and other factors such as land use and land cover in a region, groundwater dynamics, drainage patterns, channel geomorphology, and regulation. In the Upper Mississippi Region (2-digit HUC 07), multiple studies have identified increasing trends in the observed, annual, average streamflow (Novotny and Stefan, 2007; Mauget, 2004; Small, Islam, and Vogel, 2006) and in the observed, annual, mean/median baseflow (Juckem et al., 2008; Xu et al., 2013). Seasonally, studies have reported increasing annual, minimum, 7-day, low flows in the fall (Small, Islam, and Vogel, 2006) and annual, average, 7-day, low flows in the fall and winter (Novotny and Stefan, 2007). Some studies have found that annual peaks are increasing in the spring and summer (Novotny and Stefan, 2007).

The 2020 USACE *Mississippi River Geomorphology and Potamology* (MRG&P) *Study* also indicates that annual water yield, annual maximum daily water yield, and annual maximum 7-day water yield are increasing throughout the Upper Mississippi River Basin (USACE, 2020). Water yield represents discharge per unit of watershed area. For the 2020 USGS study, water yield was normalized by total annual precipitation to differentiate between the influence of altered precipitation versus other drivers of change in hydrologic response. Evaluations of precipitation-normalized water yield indicate that changes to water management and land use/cover in the Upper Mississippi River Basin are exacerbating increases in water yield (Simon et al., 2020). There is little to no consensus in the literature regarding changes in projected streamflow in the Upper Mississippi Region.

3.4 Ecosystem Health.

Based on a 2022 report generated by the USGS, the following variables are critical to ecosystem health and have changed over time: annual discharge (maximum, mean, and minimum), duration of high discharges (exceeding the 20% AEP discharge), and monthly mean discharge. Data from four USGS gages on the were assessed in this report: Mississippi River at Winona, Minnesota (05378500); Mississippi River at Keokuk, Iowa (05474500); Mississippi River at St. Louis, Missouri (07010000); and Illinois River at Valley City, Illinois (05586100). Results from the 2022 USGS report indicate that mean and minimum annual discharges are increasing at the USGS gages at Winona, Minnesota (05378500) and Keokuk, Iowa (05474500). The duration of high discharges has also increased from 1940 to 2019 for all USGS gages analyzed. Significant increases in annual maximum discharges were detected for the

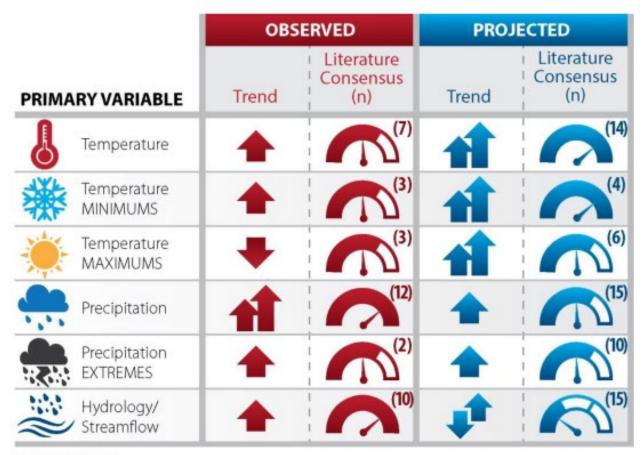
Keokuk, Iowa (05474500) and Valley City, Illinois (05586100) USGS gages. Based on an analysis of monthly mean discharges, large increases in May mean discharges were identified for all three Mississippi River gages analyzed. There is some evidence that the maximum in monthly mean discharge for a given year has shifted from occurring in April to either May or June.

Water quality analysis presented in the 2022 USGS report indicates that total suspended sediment (TSS) concentrations associated with mean discharges have decreased long-term in many reaches and tributaries of the Upper Mississippi River. The most significant changes have been observed in L&D pools 4 and 8. Phosphorus loads in all the L&D pools analyzed (pools 4, 8, 13, and 26) on the Upper Mississippi River have also decreased long-term. Although there are no long-term significant trends in dissolved oxygen (DO) for the portions of the Upper Mississippi River assessed, low DO in backwater areas has been observed more frequently in the summer than in winter.

The concentration of submersed aquatic vegetation (SAV) is considered the primary indicator of aquatic vegetative health in the Upper Mississippi River. High prevalence of SAV (generally >50-percent) indicates quality habitat for waterfowl. Aquatic vegetation analysis identified trends in SAV in L&D pools 4, 8, and 13. The prevalence of SAV in L&D pools 4 and 8 increased by 30% from 2002 to 2010. Since 2010, SAV concentrations at these two locations have plateaued. The prevalence of SAV in L&D 13's pool increased from 1998 to 2008. Since 2009, SAV concentrations have been decreasing in L&D 13's pool. Additionally, since 2000, increases in aquatic plant species diversity have been observed in L&D pools 4 and 8. In the L&D 8 and 13's pools, a positive trend in emergent vegetation has been recorded. Emergent vegetation provides habitat for aquatic species. No trends in aquatic vegetation were found within the lower portion of the Upper Mississippi River (L&D Pool 26).

3.5 Summary.

Within the literature reviewed, there is evidence that temperature, precipitation, and streamflow have increased over the observed period of record within the Upper Mississippi Watershed. Trends in water quality within the Upper Mississippi Watershed indicate decreases in total phosphorus and total suspended solids. Aquatic vegetation analysis indicates increases in SAV in L&D pools 4, 8, and 13 in early 2000s through 2010. SAV concentrations have plateaued through 2019. Projections of future long-term weather patterns show strong consensus on increases in future temperature, and moderate consensus on increases in future precipitation. There is little to no consensus related to trends in future streamflow. **Figure 2** from the 2015 USACE *Civil Works Technical Report CWTS-2015-13* provides a visual summary of the trends in observed and projected hydrometeorological variables for 2-digit HUC 07, the Upper Mississippi Region.



TREND SCALE



LITERATURE CONSENSUS SCALE



Figure 2. Summary matrix of UMR (HUC 07) observed and projected long-term weather variability trends (USACE, 2015)

4.0 NONSTATIONARITY DETECTION AND TREND ANALYSIS

The assumption that hydrologic timeseries are stationary (their statistical characteristics are unchanging) in time underlies many traditional hydrologic analyses. Statistical tests can be used to test this assumption using the techniques outlined in USACE Engineering Technical Letter (ETL) 1100-2-3, *Guidance for Detection of Nonstationarities* (2017). The USACE Time Series Toolbox (TST) tool is a web-based tool that performs the statistical tests described in the guidance. Average, annual streamflow is analyzed for the Horse Island project because average annual streamflow is most representative of flows features experience throughout the year (Van Appledorn, 2022).

The Chester gage captures 708,600 square miles of drainage area and is influenced by regulation from the locks and dams on the Mississippi River. The locks and dams were constructed and placed into operation starting in 1937, and maintain the minimum depth required for navigation. Operation of the locks and dams does not have a significant impact on annual, average streamflow since any excess volume of water beyond what is needed to maintain navigation depth is discharged downstream. The TST tool is applied to detect nonstationarities and trends for the period of record from water year 1943 to 2024. Flow values at Chester gage are determined based on a stage rating curve, which introduces some uncertainty.

The average flow record observed at Chester has evidence of nonstationarities in water years 1952, 1959, 1964, 1967, 1973, and 1981. A strong nonstationarity is one that demonstrates a degree of consensus, robustness, and a significant increase or decrease in the sample distribution, mean, and/or variance. The nonstationarities detected by the TST tool do not demonstrate consensus because they were not identified by multiple tests targeted at identifying a change in the overall statistical distribution (light blue bar in Figure 3). The nonstationarities in 1952 and 1981 are considered robust because for both years, tests targeted at identifying nonstationarities in different statistical properties identify a change in distribution (light blue bars in Figure 3) and mean (dark blue bars in Figure 3). The magnitude of the annual mean streamflow increases has several significant changes: 222,800 cfs from 1943 – 1951; 147,000 cfs from 1953 – 1963; 179,200 cfs from 1965 – 1966; 208,500 cfs from 1968 – 1980; and 242,400 from 1982 – 2023. Linear and monotonic trends are evaluated using the t-test, Mann-Kendall, and Spearman Rank Order tests. The significance of trends is evaluated using a 0.05 level of significance threshold (p-value<0.05 is considered statistically significant). Trend analysis indicates no statistically significant trends for the 1943-2023 period of record by the t-Test (p-value= 0.177), Mann-Kendall test (p-value=0.166), or Spearman Rank-Order test (pvalue=0.178), see **Figure 4**.

Because there is weak evidence of nonstationarity in 1952, 1959, 1964, 1967, 1973, and 1981, the subset of the record after 1981 was also analyzed for monotonic trends. There is also no statistically significant trend in the data recorded between 1981-2023, see **Figure 5**.

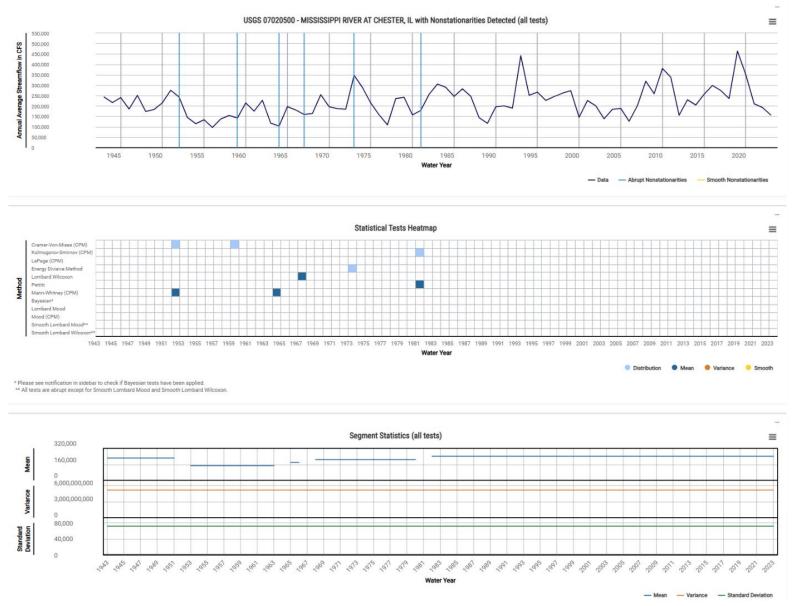


Figure 3. Time Series Toolbox Output for Annual Mean Streamflow at Chester Gage.

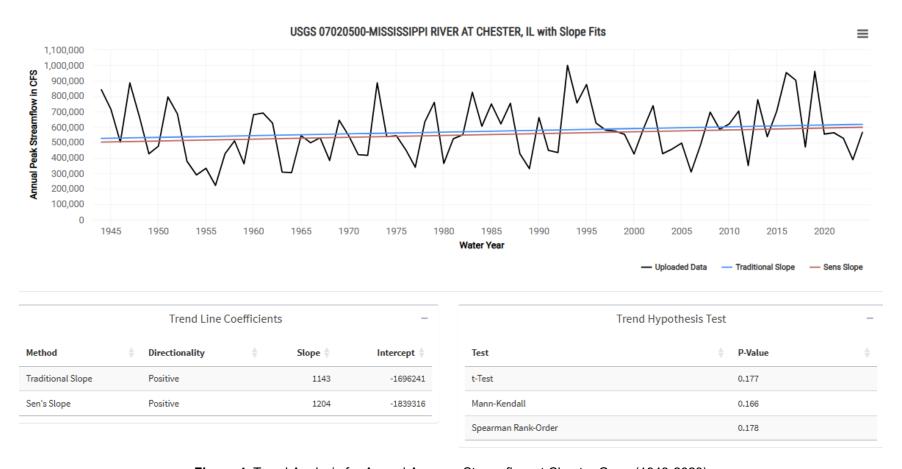
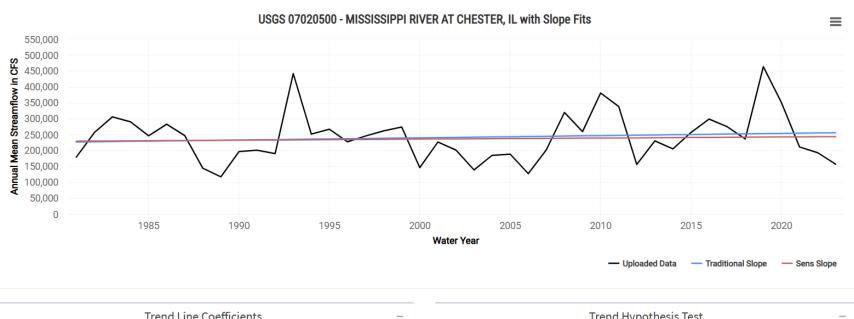


Figure 4. Trend Analysis for Annual Average Streamflow at Chester Gage (1943-2023)



Trend Line Coefficients										
Method	A	Directionality	*	Slope 🖣	Intercept ϕ					
Traditional Slope		Positive		692	-1145228					
Sen's Slope		Positive		340	-444580					

Trer	nd Hypothesis Test	-
Test	P-Value	A
t-Test	0.471	
Mann-Kendall	0.675	
Spearman Rank-Order	0.631	

- A statistically significant trend (at the alpha = .05 level) was NOT detected by the t-Test.
- A statistically significant trend (at the alpha = .05 level) was NOT detected by the Mann-Kendall Test.
- A statistically significant trend (at the alpha = .05 level) was NOT detected by the Spearman Rank-Order Test.

Figure 5. Trend Analysis for Annual Average Streamflow at Chester Gage (1981-2023)

5.0 CLIMATE HYDROLOGY ASSESSMENT TOOL (CHAT)

The USACE Climate Hydrology Assessment Tool (CHAT) displays various simulated, historic, and future streamflow, temperature, and precipitation outputs derived from 32 GCMs. The CHAT uses Coupled Model Intercomparison Project Phase 5 (CMIP5) GCM meteorological data outputs that have been statistically downscaled using the Localized Constructed Analogs (LOCA) method. GCMs rely on scenarios representing different pathways to a given atmospheric concentration of greenhouse gas emissions (GHG) referred to as representative concentration pathways (RCPs). RCPs describe the change in radiative forcing at the end of this century, as compared with pre-industrial conditions. Projected hydroclimate data in the CHAT for 2006 to 2099 are produced using two future scenarios: RCP 4.5 (where greenhouse gas emissions stabilize by the end of the century) and RCP 8.5 (where greenhouse gas emissions continue to increase throughout the century). Simulated output representing the historic period of 1951 to 2005 is generated using a reconstitution of historic GHG emissions.

To analyze runoff, LOCA-downscaled GCM outputs are used to force an unregulated Variable Infiltration Capacity (VIC) hydrologic model. Areal runoff from VIC is then routed through a stream network using MizuRoute. Outputs represent the daily in-channel routed streamflow for each stream segment – valid at the stream segment endpoint. Since the runoff is routed, the streamflow value associated with each stream segment is a representation of the cumulative flow including all upstream runoff as well as the local runoff contributions to that specific segment. Within the CHAT, streamflow output can be selected by stream segment and precipitation/temperature output can be selected for a given 8-digit HUC watershed.

The Mississippi River project areas are in 4-digit HUC 0714 (Upper Mississippi-Kaskaskia-Meramec). The 8-digit HUC of interest specific to the study area is the Upper Mississippi – Cape Girardeau watershed (HUC 07140105). The stream segments (as numbered in CHAT) near the project area are shown in **Figure 6**. Stream segment 07001487 has minimal flows (in comparison to the Mississippi River) that mostly come from local drainage; therefore, stream segment 07001486 was going to be used in CHAT as the flow on the main channel of the Mississippi River controls the flood (or lack of) conditions in the project area. However, in the CHAT stream segments 07001487 and 07001486 do not accurately represent real-life (in the CHAT stream segment 07001486 has very little flow, while 07001487 is depicted to have the flow appropriate for the main channel). Due to this discrepancy between CHAT and real-life conditions, Mississippi River stream segment 07001489 (part the main channel of the Mississippi River downstream of the project area) was chosen for this analysis.

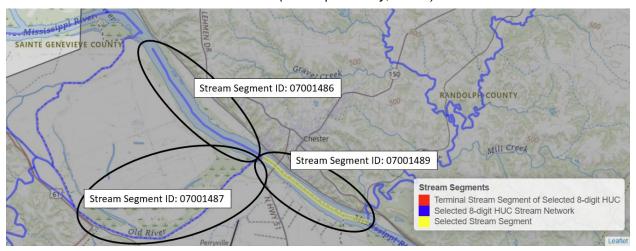


Figure 6. Stream Segments near the Horse Island Project Area

Figure 7 and **Figure 8** show the range of the modeled, annual-mean 1-day streamflow and annual-maximum 1-day temperature output presented for the historic period (1951-2005) and the future period (2006-2099). The annual-mean 1-day streamflow is analyzed for this assessment to investigate if and how potential, future streamflow conditions will change. Annual-maximum 1-day temperature is analyzed for this assessment as a proxy for water temperature. Warmer water holds less dissolved oxygen (DO) which affects the survival of aquatic life (USGS 2018). The range of data is indicative of the uncertainty associated with projected, altered streamflow and temperature.

Annual-Mean 1-day Streamflow HUC 07140105 - Upper Mississippi-Cape Girardeau Stream Segment ID: 07001489

Range & Mean of Historic (1951-2005) & Future (2006-2099) Model Outputs Future Period Outputs Assume: Both RCP Scenarios

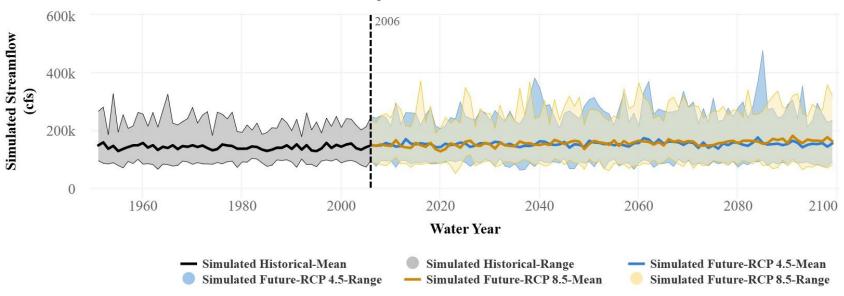


Figure 7. Range of Annual-Mean Streamflow Model Output for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

Annual-Maximum 1-day Temperature HUC 07140105 - Upper Mississippi-Cape Girardeau Stream Segment ID: 07001489

Range & Mean of Historic (1951-2005) & Future (2006-2099) Model Outputs Future Period Outputs Assume: Both RCP Scenarios

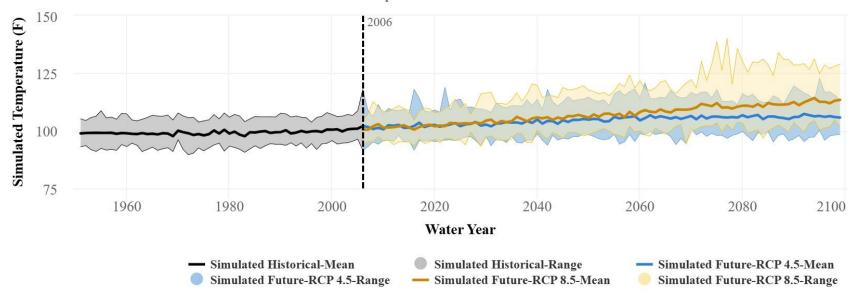


Figure 8. Range of Annual Maximum Temperature Model Output for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

For the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) trends are evaluated using the t-Test, Mann-Kendall, and Spearman Rank-Order tests. All three statistical tests are applied using a 0.05 level of significance (p-values<0.05 are considered statistically significant).

As displayed in **Figure 9**, the directionality and magnitude of change in statistically significant trends in annual-mean streamflow are evaluated using the slope of the fitted linear regression relationship. The results of the three statistical tests and the slopes associated with identified, statistically significant trends are presented in Table 1. The mean of the 32 projections of simulated annual-mean 1-day streamflow for the future period (2006-2099) shows a statistically significant, positive trend for the Upper Mississippi – Cape Girardeau watershed (HUC07140105) Stream Segment- 07001489 when RCP 8.5 is assumed. The trendline has a slope of 209.07 cfs a year, which equates to a 10,453.5 cfs change in the average of the 32 projections of annual- mean streamflow over a 50-year period. When the CHAT is used to evaluate the change in Epoch-Mean of simulated annual-mean streamflow it is found that for RCP 4.5 the change from the base epoch (1976-2005) to the mid-century epoch (2035-2064) is 6%, while for RCP 8.5 the change from the base epoch to the mid-century epoch is 10%. By the end-century epoch (2070-2099) the change relative to the base period is 9% for RCP 4.5 and 14% for RCP 8.5. There is no statistically significant trend in simulated, historic flows (1951-2005) or annual-mean streamflow for the future period (2006-2099) when RCP 4.5 is assumed.

Table 1. Trend Analysis of Average Model Output: Annual – Mean 1-Day Streamflow for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

	Historic		ture 5-2099)		Historic				Future (20	006-2099)		
Trend				(1951-2005)				RCP 4.5		RCP 8.5		
Analysis	ı	p-values		Statistically Significant? (<0.05)	Slope (cfs/year)	Direction	Statistically Significant? (<0.05)	Slope (cfs/year)	Direction	Statistically Significant? (<0.05)	Slope (cfs/year)	Direction
t-Test	0.459	0.251	<0.001	No			No			Yes		
Mann- Kendall	0.495	0.205	<0.001	No	-48.946	1	No	32.19	↑	Yes	209.07	1
Spearman Rank Order	0.555	0.18	<0.001	No			No			Yes		

Annual-Mean 1-day Streamflow HUC 07140105 - Upper Mississippi-Cape Girardeau Stream Segment ID: 07001489

Simulated Trends in Mean of Historic (1951-2005) & Future (2006-2099) Model Outputs Future Period Outputs Assume: Both RCP Scenarios

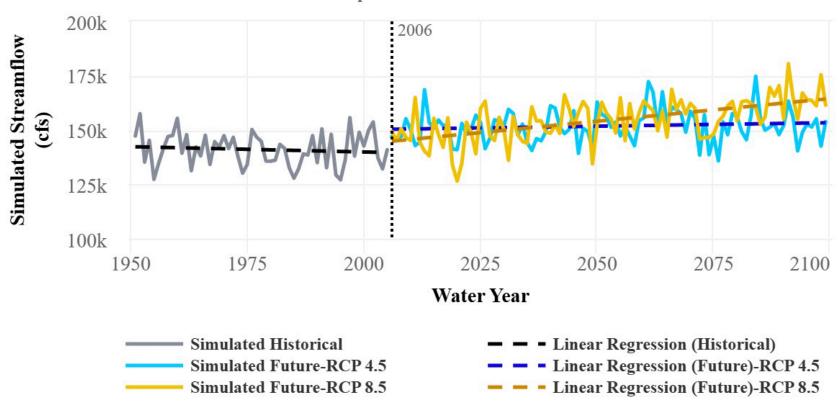


Figure 9. Trend Analysis of Average Model Output: Annual-Mean 1-day Streamflow for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

For the mean of the 32 projections (per RCP) of annual-maximum temperatures, the results of the three statistical tests and the slopes associated with statistically significant trends are presented in Table 2 and Figure 10. The mean of the simulated annual-maximum 1-day temperature projections (future period: 2006-2099) shows a statistically significant, positive trend for the Upper Mississippi - Cape Girardeau watershed under both the moderate (RCP 4.5) and higher (RCP 8.5) emission scenarios. Both outputs project a significant magnitude of change in temperature over the next fifty years. The CHAT computes a trendline slope of 0.0577 °F per year for the lower emission scenario, which would be a 2.9 °F increase in maximum temperature over a 50-year period. The CHAT computes a trendline slope of 0.137 °F per year for the RCP 8.5 emission scenario, which would be a 6.9 °F increase in maximum temperature over a 50-year period. There is also a statistically significant increasing trend in simulated, historic temperatures between 1951 and 2005 (slope of 0.0288 °F per year). When the CHAT is used to evaluate the change in Epoch-Mean of simulated annual-maximum temperature it is found that the median change from the base Epoch (1976-2005) to the midcentury epoch (2035-2064) is 4.74 °F for RCP 4.5 and 6.04 °F for RCP 8.5. By the end-century epoch (2070-2099) the change relative to the base period is 5.75 °F for RCP 4.5 and 10.88 °F for RCP 8.5.

Table 2. Trend Analysis of Average Model Output: Annual Maximum Temperature for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

	Historic		ture -2099)		Historic				Future (2	006-2099)		
Trend	Trend 2003) 4.5 8.		RCP 8.5	(1951-2005)				RCP 4.5		RCP 8.5		
Analysis		p-values		Statistically Significant? (<0.05)	Slope (°F/year)	Direction	Statistically Significant? (<0.05)	Slope (°F/year)	Direction	Statistically Significant? (<0.05)	Slope (°F/year)	Direction
t-Test	<0.001	<0.001	<0.001	Yes			Yes			Yes		
Mann- Kendall	<0.001	<0.001	<0.001	Yes	0.0288	1	Yes	0.0577	↑	Yes	0.137	1
Spearman Rank Order	<0.001	<0.001	<0.001	Yes			Yes			Yes		

Annual-Maximum 1-day Temperature HUC 07140105 - Upper Mississippi-Cape Girardeau Stream Segment ID: 07001489

Simulated Trends in Mean of Historic (1951-2005) & Future (2006-2099) Model Outputs Future Period Outputs Assume: Both RCP Scenarios

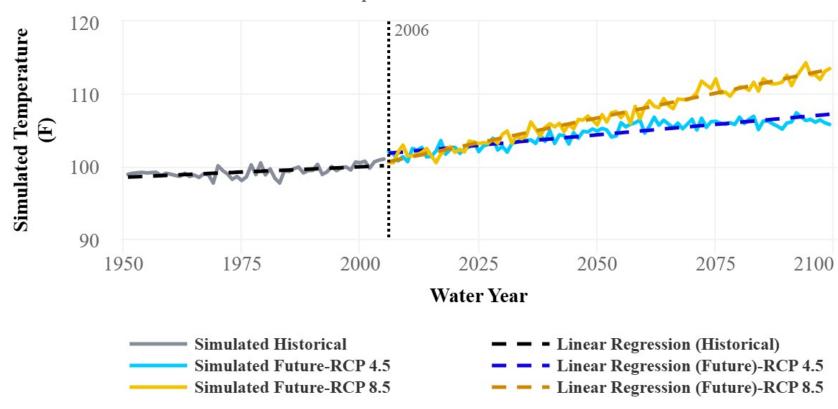


Figure 10. Historic and Projected trends in historic and projected mean annual maximum temperatures for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

The CHAT provides streamflow and temperature outputs analyzed comparatively by describing simulated changes in monthly streamflow and temperature between different epochs (time periods). Monthly streamflow and temperature output is analyzed by determining the mean of the monthly value for the variable of interest for each GCM for three epochs: 1950-2005 (baseline), 2035-2064 (mid-century), and 2075-2099 (end of century). The difference between GCM/Month/Epoch means are determined for both the baseline vs. mid-century and baseline vs. end of century epochs and results are presented as boxplots. These boxplots provide insight into both the range of results and the seasonality of changes in streamflow and temperature overtime.

For stream segment 07001489 in the Upper Mississippi – Cape Girardeau watershed (HUC07140105), changes in epoch-mean of simulated monthly mean streamflow are presented in **Figure 11**. For the stream segment of the Mississippi River analyzed, it appears that for both the mid-century and end-century epochs December through June mean flows are increasing with those flows derived using RCP 8.5 and those derived by assuming RCP 4.5. Greater increases are observed during December through June for the end of the century epoch (other than for the RCP 4.5 scenario in May where the mid-century and end of century epoch show the same change). Interestingly, August-September flows appear to be decreasing regardless of what RCP is assumed for both epochs and RCPs analyzed.

For the Upper Mississippi – Cape Girardeau watershed, simulated maximum temperatures for both the mid-century epoch (2035-2064) and the end-century epoch (2070-2099) are increasing relative to historic temperature simulations (1976-2005) for all months and both RCPs. For the mid-century comparisons, 2.4 °F increases or greater in temperature are projected under RCP 8.5 for all months. Larger changes in temperature are projected by the end of century. As compared to the temperature changes projected by mid-century, for the 2070-2099 epoch, there are larger differences in results where RCP 8.5 was assumed versus RCP 4.5. When RCP 8.5 is assumed, over 10°F of warming is projected in May through October. All RCP 8.5 comparisons show greater than 5°F of warming. When RCP 4.5 is assumed, between 4°F to 7°F of warming is projected for all months. Increases in maximum air temperature, particularly in the summer (June-August), are likely to increase water surface temperatures. This has the potential to adversely impact water quality by decreasing DO in wetland areas within the study area.

Change in Monthly-Mean Streamflow: Box Plots HUC 07140105 - Upper Mississippi-Cape Girardeau Stream Segment ID: 07001489

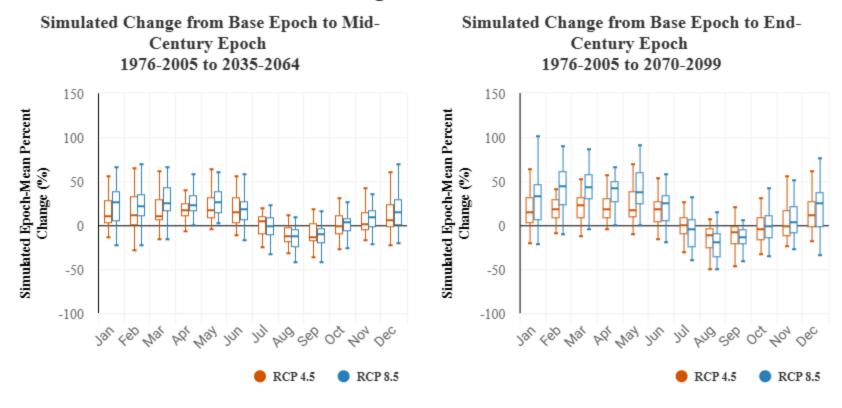


Figure 11. Change in Epoch-Mean of Simulated Monthly Mean Streamflow for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

Change in Monthly-Maximum Temperature: Box Plots HUC 07140105 - Upper Mississippi-Cape Girardeau Stream Segment ID: 07001489

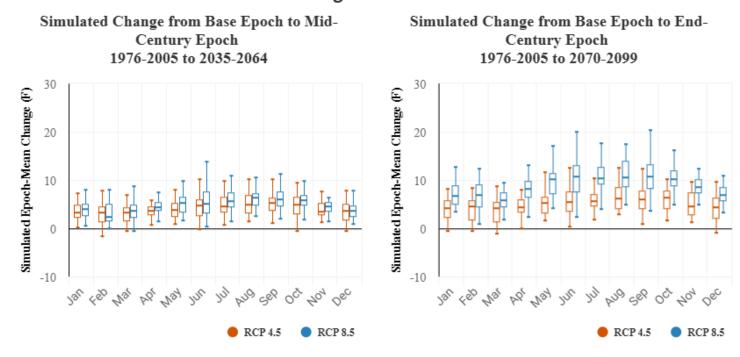


Figure 12. Change in Epoch-Mean of Simulated Monthly Maximum Temperature for the Upper Mississippi – Cape Girardeau watershed (HUC 07140105) Stream Segment: 07001489

6.0 VULNERABILITY ASSESSMENT

The USACE Climate Change Vulnerability Assessment (VA) Tool facilitates a screening level, comparative evaluation of long-term weather variability exposure to projects for a selected USACE business line in a given 4-digit HUC watershed relative to the other 4-digit HUC watersheds within the continental United States (CONUS). A series of indicator variables are computed and aggregated into a vulnerability score using the weighted-order, weighted-average (WOWA) approach. The tool uses the CMIP5 GCM based Bias Corrected, Spatially Disaggregated (BCSD) VIC dataset (2014) to define projected, hydrologic, and meteorologic inputs to the tool's WOWA scores.

The WOWA scores and indicator variable values are available for two subsets of simulations (wet- top 50% by cumulative runoff projections and dry- bottom 50% by cumulative runoff projections). Data are available for three epochs. The epochs include a historic period (Base epoch) and two 30-year, future epochs (centered on 2050 and 2085). The Base epoch is not based on projections and so it is not split into a wet and dry subset. Watersheds with WOWA scores specific to a given business line, that fall within the top 20% of WOWA scores for watersheds in the CONUS are identified as being vulnerable to long-term weather variability. The projected datasets incorporated into VA scores contain considerable uncertainty. Some of this uncertainty is reflected by the differences in results for each of the subset-epoch combinations.

The tool is applied using the default, National Standards Settings and for the ecosystem restoration business line. Indicators used to compute the Ecosystem Restoration WOWA score include: change in sediment load due to change in future precipitation, cumulative monthly runoff variation relative to mean annual runoff, runoff elasticity (ratio of streamflow runoff change to precipitation change), macroinvertebrate index of biotic condition, local mean annual runoff, low flow reduction, percent of freshwater plant communities at risk, and two indicators of flood magnification (indicator of how much high flows are projected to change over time).

As shown in **Figure 13**, compared to the other 4-digit HUC watersheds in the CONUS, the Upper Mississippi-Kaskaskia-Meramec (HUC 0714) watershed does not have a vulnerability score in the top 20% for the ecosystem restoration business line. This is a comparative evaluation and thus does not imply that the watershed is not vulnerable to future, changing conditions impacts. Results indicate that for the select metrics incorporated into the tool, this watershed may be less exposed to potential impacts relative to other watersheds in the CONUS. This is true for both the wet and dry subsets and both the 2050 and 2085 epochs.

As can be seen in **Figure 13** and **Table** 3, the dominant indicator variable contributing to the Ecosystem Restoration business line VA score for the Upper Mississippi-Kaskaskia-Meramec (HUC 0714) watershed is (8) At Risk Freshwater Plants for all epoch and subset combinations. The WOWA score changes by less than 1% between the 2050 and 2085 epochs for both the wet and dry subsets. The percentage by which the indicator variable contributes to the VA score does not significantly change over time. Because this indicator variable is not dependent on computed, GCM based changes in future hydrology (temperature, precipitation, streamflow) this indicator variable value is constant over time.

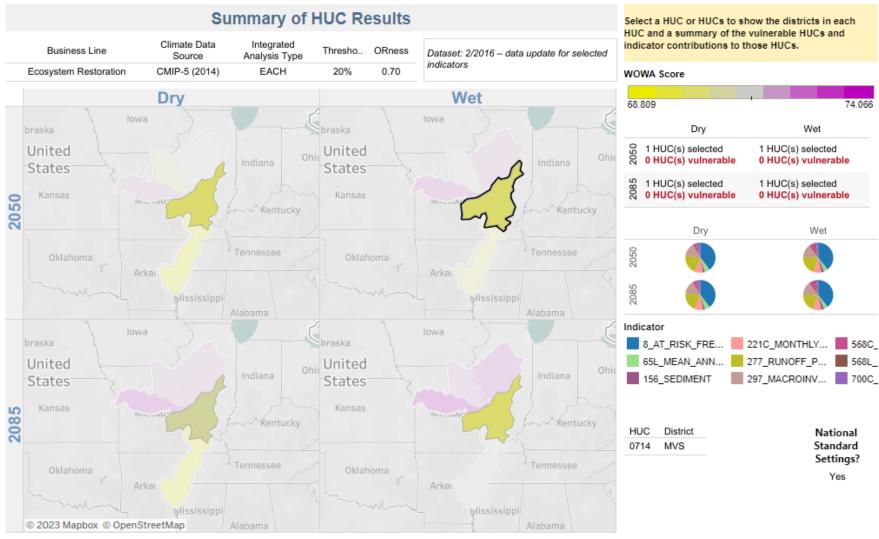


Figure 13. Output of the Vulnerability Assessment tool – Upper Mississippi-Kaskaskia-Meramec watershed

Table 3. VA Tool Output- HUC 0714 Upper Mississippi-Kaskaskia-Meramec Watershed Ecosystem Restoration

Subset	Epoch	VA Score	% Change in VA Score	Dominant Indicator	Dominant Indicator % Change (2050 to 2085): Contribution	Dominant Indicator % Change (2050 to
			(2050 to 2085)		to Overall WOWA Score	2085): Indicator Value
WET	2050	70.368	0.20%	8- At Risk	39.32%	27.67
				Freshwater Plants		(Constant Overtime)
WET	2085	70.510	0.20%	8- At Risk	39.24%	27.67
				Freshwater Plants		(Constant Overtime)
DRY	2050	70.354	0.31%	8- At Risk	39.74%	27.96
				Freshwater Plants		(Constant Overtime)
DRY	2085	70.572	0.31%	8- At Risk	39.62%	27.96
				Freshwater Plants		(Constant Overtime)

7.0 CONCLUSION

Over the 50-year period of analysis, the Horse Island NESP Project aims to restore the quality, resiliency, extent, and diversity (age, species composition, and structural complexity) of floodplain forest and wetland habitat in the project area. Proposed project measures include:

- Tree planting in open areas,
- Forest Stand Improvement,
- · Wetland restoration, and
- Ridge and swale creation/restoration (topographic diversity).

Based on the weight of evidence presented in this assessment, changing conditions impacts are anticipated to affect the study area's hydrology over the project's 50-year life cycle. Available literature suggests warmer and wetter long term weather trends in the future. There are statistically significant increasing trends in projected flow data analyzed specific to this study area. As flow increases, floodplain forest habitat may be inundated more often. There is also evidence that temperatures are increasing in the study area which may negatively affect water quality and aquatic habitat. Table 4 indicates potential residual risks for this project due to changing weather conditions, along with a qualitative rating of how likely those residual risks are to materialize and undermine project features resulting in harm to the study area. To add resilience to the project, the PDT:

- · Selected flood and heat tolerant species,
- Selected a greater variety of species than are currently present,
- Selected species based on their planting elevation to ensure resiliency against high-water events to reduce the cost of Adaptive Management, and
- Identified plantings to take place over multiple seasons (if a large flood happens after the first planting season, there will be subsequent planting seasons if a large flood happens after the subsequent planting seasons, the original plantings will have already had some chance to establish, increasing their chance of survivability).

Within the Upper Mississippi River Region, changing long term weather trends poses a potential risk to ecosystems due to the likelihood of the region experiencing shifts in the flow regime and increases in temperature in the future. Projects like the NESP Horse Island project will serve to offset some of this risk by diversifying habitat. The standard practices used to design and construct USACE, ecosystem restoration projects include a degree of resilience because features are typically designed to accommodate a wide range of flow conditions. Thus, it is unlikely that potential future increases in flow will undermine project features. It is likely that increasing temperatures will place added stress on the ecosystem in the future. Ecosystem restoration standard design practices have been generated based on lessons learned from successful projects constructed between 1981 and 2015. Most of these standards are listed in the 2012 Upper Mississippi River Restoration (UMRR) Design Handbook (USACE 2012). Even though USACE ecosystem restoration projects can already be considered inherently resilient, it would be worthwhile to consult with experts in habitat creation and maintenance to see if there are any additional opportunities to incorporate additional innovative, resilient measures into the final design without incurring a significant change in cost. Added resilience should be targeted at ensuring project measures can withstand higher flows (and higher water surface elevations) and greater periods of inundation. A potential mechanism by which to accomplish this is to explore the development of an adaptive management plan, whereby if conditions are observed to be changing in the future, certain project measures can be designed and/or flagged to accommodate the flexibility to be modified in response to changing future conditions.

Table 4. Residual Risk Due

Project Feature	Trigger	Hazard	Harm	Qualitative Likelihood ¹	Justification of Likelihood Rating
Tree planting	Increased Flow/WSEs	Higher WSEs and longer inundation periods could negatively affect forest health by 'drowning trees' and depositing more sediment in the forest.	Less suitable habitat.	Unlikely	The maximum projected mean daily flow increase of 10,000 cfs after 50 years is unlikely to change the forest health. However, there is not availability within the tools to speculate whether there will be increased high inundation periods.
Forest Stand Improvement	Increased Flow/WSEs	Higher WSEs and longer inundation periods could negatively affect forest health by 'drowning trees' and depositing more sediment in the forest.	Less suitable habitat.	Unlikely	The maximum projected mean daily flow increase of 10,000 cfs after 50 years is unlikely to change the forest health. However, there is not availability within the tools to speculate whether there will be increased high inundation periods.
Wetland Restoration	Increased Flow/WSEs	Higher WSEs and longer inundation periods could harm vegetation in the wetlands and deposit more sediment on the wetlands.	Less suitable habitat.	Unlikely	The maximum projected mean daily flow increase of 10,000 cfs after 50 years is unlikely to change the forest health. However, there is not availability within the tools to speculate whether there will be increased high inundation periods.
	Increased Temperature	Higher temperatures could negatively affect habitat and water quality.	Less suitable habitat.	Highly Likely	The maximum projected annual maximum 1-day temperature increase of 6.9°F after 50 years is likely to affect the water quality within wetland areas. Higher temperatures at shallow water depths will decrease dissolved oxygen.

Project Feature	Trigger	Hazard	Harm	Qualitative Likelihood ¹	Justification of Likelihood Rating
Ridges and Swales	Increased Flow/WSEs	If increased WSEs led to increased velocities, then the ridges could erode. Higher WSEs and longer inundation periods could harm vegetation in the wetlands and deposit more sediment on the ridges and swales.	Unprotected banks could erode. Swales could have increased sedimentation.	Highly Unlikely	The maximum projected mean daily flow increase of 10,000 cfs after 50 years is not enough to significantly change the expected amounts of erosion and deposition.

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THE MIAMI TRIBE OF OKLAHOMA,
THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

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REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

WHEREAS, the U.S. Army Corps of Engineers (USACE) is authorized to carry out the Upper Mississippi River – Illinois Waterway System (UMR-IWW) Navigation and Ecosystem Sustainability Program (NESP) pursuant to Title VIII of the Water Resources Development Act (WRDA) of 2007 (P.L. 110-114); and,

WHEREAS, the USACE implements projects under the NESP to attain and maintain the sustainability of the UMR-IWW ecosystem, addressing the cumulative impacts and ongoing effects of the navigation system and improving ecological integrity of the UMR-IWW, including projects with measures for island building, restoration of floodplain, backwater, side channels, and tributary confluences, fish passage, water level management, wing dam and dike restoration and modification, island and shoreline protection; topographical diversity, dam point control, use of dredged material for environmental purposes, spillway, dam, and levee modification to benefit the environment, and land and easement acquisition, as well as cultural resource management and mitigation and forest management; and,

WHEREAS, the USACE is also authorized to carry out the Upper Mississippi River Restoration (UMRR) Program for Habitat Rehabilitation and Enhancement Projects (HREP) pursuant to Section 1103 of the WRDA of 1986 (P.L. 99-662), as amended, codified in 33 U.S.C. 652; and,

WHEREAS, the USACE implements projects under the UMRR Program to rehabilitate and enhance habitat of the Upper Mississippi River System (UMRS); and,

WHEREAS, the USACE, as a Federal agency, is required to comply with Section 106 of the National Historic Preservation Act (NHPA), as amended (54 U.S.C. § 306108) and its implementing regulations, "Protection of Historic Properties," codified in 36 CFR § 800; and,

WHEREAS, the USACE has determined that projects under the NESP and UMRR Programs (hereinafter the "Programs") entail undertakings which may have the potential to affect historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) as defined under 36 CFR § 800.16(y); and,

WHEREAS, the USACE has determined due to the nature of the Programs, their generally shared multi-state geographic region and similar authorized purposes, that a combined Programmatic Agreement (PA) to address both Programs is needed to clarify review procedures, improve consistency, consultation, and accountability in fulfilling its responsibilities to comply with Section 106 of the NHPA pursuant to 36 CFR § 800.14(b)(2) for the Program undertakings, as defined in Stipulation I.A.; and,

WHEREAS, the Program undertakings are subject to development and analysis which is detailed in Project Implementation Reports (PIRs), Feasibility Reports, or other decision or implementation documents which discuss program undertaking alternatives and typically identify a Tentatively Selected Plan in the draft decision document, followed by a Recommended Plan in the final decision document, that becomes the proposed project after decision document approval; and,

WHEREAS, the Program undertakings are subject to environmental review under the National Environmental Policy Act (NEPA) and other environmental laws; and,

WHEREAS, the USACE may defer the identification of the Area of Potential Effect (APE), as defined in Attachment B, and completion of the Section 106 process to include final identification and evaluation of historic properties, assessment of project effects to historic properties, and resolution of adverse effects, if any, until after completing the final USACE decision document and requirements of NEPA for a Program undertaking but before the implementation of the Program undertaking begins; and,

WHEREAS, this PA does not invalidate or supersede existing program alternatives or any other applicable Section 106 agreements including project level agreements for Steamboat HREP (Rock Island District), Quincy Bay HREP (Rock Island District), and Green Island HREP (Rock Island District), executed for undertakings already being implemented under either of the Programs; and,

WHEREAS, the USACE shall seek ways to avoid, minimize, and mitigate any adverse effects to historic properties, listed on or eligible for inclusion in the NRHP; and,

WHEREAS, the USACE has consulted with the State Historic Preservation Offices of Illinois (IISHPO), Iowa (IaSHPO), Minnesota (MnSHPO), Missouri (MoSHPO), and Wisconsin (WiSHPO) (collectively, the "SHPOs") on the development of this PA, and the SHPOs are Signatories to this PA; and,

WHEREAS, the U.S. Fish and Wildlife Service (USFWS) has designated the USACE as the lead federal agency for Section 106 compliance for the Programs but will participate as a Signatory to this PA because it will be responsible for the operation and maintenance of Program

undertakings on lands and waters it administers or manages and would need to issue an Archaeological Resources Protection Act (ARPA, 16 U.S.C. 470 et seq) permit for work on Federal lands under the agency's jurisdiction; and,

WHEREAS, the National Park Service (NPS) has designated the USACE as the lead federal agency for Section 106 compliance for the Programs but will participate as an Invited Signatory to this PA because it will be responsible for the operation and maintenance of Program undertakings on lands and waters it administers or manages and would need to issue an ARPA permit for work on Federal lands under the agency's jurisdiction; and,

WHEREAS, the USACE recognizes the Federal government's special relationship with Federally recognized Indian Tribes and is responsible for government-to-government consultation pursuant to the NHPA, 36 CFR § 800.2(c)(2)(ii), the American Indian Religious Freedom Act (AIRFA, 42 U.S.C. 1996), Executive Orders 13007 and 13175, and Sections 3(c) and 12 of the Native American Graves Protection and Repatriation Act (NAGPRA, 25 U.S.C. 3001 et seq.); and,

WHEREAS, in accordance with 36 CFR § 800.2(c)(2)(ii), 800.3(f)(2), and 800.14(b)(2), the USACE, in a letter dated 14 October 2022, initiated consultation with 55 Federally recognized Indian Tribes (collectively, the "Consulting Tribes"), that may ascribe religious or cultural significance to historic properties that have the potential to be affected by Program undertakings and are entitled to be consulted about the identification and assessment of effects on historic properties, to consult on the development of this PA and these Tribes include the Absentee-Shawnee of Oklahoma, Bad River Band of Lake Superior Chippewa, Bois Fort Band of Chippewa, Caddo Nation of Oklahoma, Citizen Potawatomi Nation in Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee of Oklahoma, Flandreau-Santee Sioux, Fond du Lac Band of Lake Superior Chippewa, Fort Belknap Community, Forest County Potawatomi Community, Grand Portage Band of Lake Superior Chippewa, Hannahville Indian Community, Ho-Chunk Nation of Wisconsin, Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Keweenaw Bay Community, Kickapoo Traditional Tribe of Texas, Kickapoo Tribe in Kansas, Kickapoo Tribe of Oklahoma, Lac Courte Oreilles Band of Lake Superior Chippewa, Lac du Flambeau Band of Lake Superior Chippewa, Lac Vieux Desert Band of Lake Superior Chippewa, Little Traverse Bay of Odawa, Leech Lake Band of Ojibwe, Lower Sioux Community, The Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, Menominee Tribe of Wisconsin, Mille Lacs Band of Ojibwe, Miami Tribe of Oklahoma, Nottawaseppi Huron Band of Potawatomi, Omaha Tribe of Nebraska, Otoe-Missouria Tribe, Peoria Tribe of Oklahoma, Pokagon Band of Potawatomi, Prairie Band of Potawatomi Nation, Prairie Island Community, Quapaw Nation, Red Cliff Band of Lake Superior Chippewa, Sac and Fox Nation of Missouri in Kansas and Nebraska, Sac and Fox Nation of Oklahoma, Sac and Fox Tribe of the Mississippi in Iowa (Meskwaki Nation), Santee Sioux Nation, Shakopee Mdewakanton Sioux, Shawnee Tribe, Sisseton-Wahpeton Oyate, Sokaogon Chippewa Community (Mole Lake Band of Lake Superior Chippewa), Spirit Lake Nation, St. Croix Band of Chippewa, The Osage Nation, United Keetoowah Band of Cherokee, Upper Sioux Community, White Earth Band of Ojibwe, and Winnebago Tribe of Nebraska; and,

WHEREAS, in accordance with 36 CFR § 800.6(c)(2), and based on each Consulting Tribe's response, the USACE has invited The Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, the Miami Tribe of Oklahoma, the Peoria Tribe of Indians of Oklahoma, the Quapaw Nation, and The Osage Nation to be Invited Signatories, as defined in Attachment B, in this PA and each has elected to sign the PA, each as a Invited Signatory and collectively included in "Consulting Tribes"; and,

WHEREAS, each Invited Signatory Tribe has identified the area within which it may attach religious or cultural significance to historic properties that have the potential to be affected by Program undertakings, the Invited Signatory Tribe's "consultation area", as defined in Stipulation I.E, and each consultation area is included in Attachment C; and,

WHEREAS, in accordance with 36 CFR § 800.6 (c)(3), the Iowa Tribe of Kansas and Nebraska and the Winnebago Tribe of Nebraska have been invited to participate in the development of this PA and have elected to sign the PA, as a Concurring Party, as defined in Attachment B, and collectively included in "Consulting Tribes"; and,

WHEREAS, nothing in this PA diminishes or affects any treaty right of a Federally recognized Indian Tribe or any other right of a Federally recognized Indian Tribe or external boundary of an Indian reservation of a tribe. No provision of the PA shall alter existing law regarding the sovereign immunity of tribes or shall be construed to alter existing law regarding the trust duty of the United States to tribes (either to limit or expand that trust duty); and,

WHEREAS, the USACE acknowledges that Consulting Tribes possess special knowledge regarding any religious and cultural significance they may ascribe to historic properties, including Traditional Cultural Properties/Places, that may be physically or visually affected by a Program undertaking, and possess special expertise in assessing the eligibility of such properties; and,

WHEREAS, the USACE Programs benefit from consultation with Consulting Tribes in the identification and management of properties of religious and cultural significance, and the USACE shall ensure that its NHPA Section 106 procedures recognize the interests of Consulting Tribes in historic properties potentially affected by USACE decisions and afford Consulting Tribes participation in the process leading up to a USACE decision, in accordance with 36 CFR § 800; and,

WHEREAS, the USACE, USFWS, NPS, each SHPO, and each Consulting Tribe is each a Consulting Party as defined in Stipulation I.D; and,

WHEREAS, a Consulting Party will be recognized by the USACE as a Signatory, Invited Signatory, or Concurring Party, as applicable, under this PA starting on the date the Consulting Party signs the PA and provide the USACE with a record of its signature; and,

WHEREAS, the definitions set forth in 36 CFR § 800.16 are incorporated herein by reference and apply throughout this PA; and,

WHEREAS, in accordance with 36 CFR § 800.6(a)(1), the USACE, in a letter dated 19 October 2022, notified the Advisory Council on Historic Preservation (ACHP) of its decision to enter into this PA and has invited the ACHP to enter into consultation, and the ACHP has chosen to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and,

WHEREAS, the USACE provided opportunities for public review and comment on this PA by publishing online information, including a Public Notice posted on 15 November 2023 – 1 January 2024 for this PA, and receiving comments through online platforms, and will continue to engage the public, as appropriate, during Section 106 review of Program undertakings under the terms of this PA; and,

WHEREAS, for individual Program undertakings subject to this PA, the USACE may invite other agencies, organizations, and individuals to participate as Consulting Parties; and,

WHEREAS, each USACE District (St. Paul, Rock Island, or St. Louis, depending on individual Program undertakings), uses its own staff and authority and will consult with the SHPO of jurisdiction and the applicable Federally recognized Tribe(s) regarding the specific Program undertakings within its respective districts.

NOW, THEREFORE, the St. Paul, Rock Island, and St. Louis Districts of USACE, the IISHPO, the IaSHPO, the MnSHPO, the MoSHPO, the WiSHPO, the USFWS, the ACHP (Signatories), the NPS, The Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, the Miami Tribe of Oklahoma, the Peoria Tribe of Indians of Oklahoma, the Quapaw Nation, and The Osage Nation (Invited Signatories) agree that implementation of this PA in accordance with the following stipulations will allow the USACE to meet its responsibilities under Section 106 of the NHPA for the Program undertakings subject to this PA.

I. SCOPE AND APPLICABILITY

- A. This PA shall apply to all undertakings under the NESP and UMRR Programs in the St. Paul, Rock Island, and St. Louis Districts of USACE that have the potential to cause effects to historic properties, if any, and require Section 106 review after the execution of this PA; are not otherwise covered by a separate memorandum of agreement (MOA) or programmatic agreement, and for which the USACE has not recognized another federal agency as lead federal agency (hereinafter the "Program undertakings").
- B. The USACE will utilize this PA to fulfill its Section 106 responsibilities and those of the USFWS and NPS, who have designated the USACE as the lead federal agency pursuant to 36 CFR § 800.2(a)(2) for Program undertakings. The USFWS and/or NPS, as applicable may decide, and notify the USACE, for a specific Program undertaking that they will perform their own Section 106 compliance and the USACE will not be the lead federal agency for the Program undertaking. When the USACE is not designated as the lead federal agency and no other agency is designated lead federal agency, all federal agencies, including the USACE, remain individually responsible for their compliance with Section 106, but this PA will apply to Program undertakings. This provision does not prevent the USACE from recognizing another federal agency as lead federal agency for specific Program undertakings, as appropriate. If USACE recognizes another federal agency as lead federal agency for a specific Program undertaking that would otherwise be subject to this PA, this PA shall not apply.
- C. All Program undertakings to which this PA is applicable shall be reviewed in accordance with the stipulations in this PA. The USACE may combine some or all of the steps during consultation in accordance with 36 CFR § 800.3(g).
- D. Consultation among the SHPOs, Consulting Tribes, the USFWS, and the NPS (collectively, "Consulting Parties") when appropriate to this PA shall continue throughout the implementation of individual Program undertakings subject to this PA. The USACE shall identify and consult with the applicable Consulting Parties for each Program undertaking (the "Applicable Consulting Parties") consisting of:
 - 1. The SHPO or SHPOs who reflect(s) the interests of the State(s) that overlaps with the Area of Potential Effects, as defined under Stipulation III.B and Attachment B, for the individual Program undertaking ("Applicable SHPO"); and,
 - 2. The Consulting Tribes that are known to attach religious or cultural significance to historic properties within the Area of Potential Effects, as defined under Stipulation III.B, that may be affected by the individual Program undertaking ("Applicable Consulting Tribes"); and,
 - 3. The USFWS and/or NPS when that agency would have operation and maintenance responsibility for the individual Program undertaking on lands or waters it administers or manages within the undertaking's Area of Potential Effects ("Applicable Federal Agency/ies").

- E. The USACE acknowledges that contacts and consultation areas may change over time. Addressing this is primarily a USACE responsibility with assistance from the Consulting Parties. The relevant contact list for Consulting Parties at the time of execution of this PA is provided in Attachment D.
 - The USACE has requested and shall continue to request that each Consulting Tribe provide the area in which they may attach religious or cultural significance to historic properties (its "consultation area"), in the form of a map or other listing that USACE can use to identify Applicable Consulting Tribes for individual Program undertakings. All Invited Signatory Tribes have provided their consultation areas, included as Attachment C. For any Consulting Tribe who has not provided their consultation area, the USACE will use best available information to determine Applicable Consulting Tribes for Section 106 review of an individual Program undertaking.
- F. The USACE shall seek ways to identify and preserve historic properties, and to avoid, minimize, or mitigate any adverse effects on historic properties. The USACE shall also endeavor to protect burials, cemeteries, or sites likely to contain human remains/artifacts and objects associated with interments or religious activities, and provide this information, studies, and/or reports to the Applicable Consulting Parties through the implementation of historic property surveys and testing, and the treatment of historic properties.
- G. For each Program undertaking, the USACE shall achieve compliance with all relevant terms of this PA prior to initiating physical construction of the Program undertaking.

II. PERFORMANCE STANDARDS AND PROFESSIONAL QUALIFICATIONS STANDARDS

- A. Pursuant to 36 CFR § 800.2(a), the Agency Official is the District Commander of the applicable USACE district with approval authority for a specific Program undertaking, who can commit the agency to take appropriate action for the Program undertaking to comply with Section 106 under this PA. The Agency Official may delegate authority to other USACE personnel who shall act on their behalf.
- B. The USACE shall ensure all technical work, as defined in Attachment B, required under this PA is carried out in accordance with the professional standards and guidelines outlined in the Secretary of the Interior's (SOI) *Standards for Archaeology and Historic Preservation* (48 CFR 44716) and the SOI's *Standards for the Treatment of Historic Properties* (36 CFR Part 68), as applicable (individually or collectively, SOI Standards). The USACE will also consider other appropriate and applicable state laws, guidelines, or best practices for historic preservation activities within which state work is required.
 - 1. Documentation in support of the USACE historic property eligibility determinations and findings of effect shall meet the documentation requirements specified in 36 CFR § 800.11 and the SOI Standards. Current state survey requirements/guidance for

- documentation and reporting shall also be followed for work occurring in the respective state.
- C. The USACE shall ensure that technical work conducted pursuant to this PA is carried out by or under the supervision of persons meeting qualifications set forth in the SOI's *Professional Qualification Standards*, as amended, for the pertinent discipline (see 48 F.R. 44738-44739) or the United States Office of Personnel Management (OPM) qualifications for cultural resources professionals such as Archaeologist GS-0193 series, Anthropologist GS-0190 series, or Historian GS-0170 series.
- D. The USACE shall maintain professional qualified staff meeting SOI *Professional Qualification Standards*, OPM qualifications for cultural resources professionals, and/or Section 112 of the NHPA (hereafter referred to as "qualified staff".
 - 1. The USACE qualified staff assigned to review USACE Program undertakings pursuant to this PA shall be a GS-9 or higher and meet the SOI *Professional Qualification Standards* or the OPM qualifications for cultural resources professionals such as Archaeologist GS-0193 series, Anthropologist GS-0190 series, or Historian GS-0170 series.
 - 2. Qualified staff at or below the GS-7 level are considered to be performing duties in a developmental or technician capacity.
 - 3. USACE qualified staff at GS-9 or higher shall oversee and review any work conducted by GS-7 or lower graded staff when the USACE implements any portion of the PA.

III. PROGRAM UNDERTAKING REVIEW PROCESS

A. USACE INTERNAL REVIEW PROCESS

- 1. At the earliest stages of developing a Program undertaking, the USACE shall assign a qualified staff member to ensure cultural resources and historic properties are identified and considered in the USACE planning process.
- 2. In general, the area of interest for the UMRR and NESP Programs includes the UMRS as defined in Public Law 99-662, which includes both the Mississippi River from its confluence with the Ohio River near Cairo, Illinois to Upper St. Anthony Falls Lock in Minneapolis-St. Paul and the Illinois River from its confluence with the Mississippi River at Grafton, Illinois to the Brandon Road Lock and Dam, Joliet, Illinois and river reaches having commercial navigation channels on the Minnesota River, Minnesota; Black River, Wisconsin; Saint Croix River, Minnesota and Wisconsin; Illinois River and Waterway, Illinois; and Kaskaskia River, Illinois and associated floodplains (Attachment A). The area of interest includes a 5-mile buffer on either side of the navigation centerline, to accommodate potential undertakings covered by the Programs, auditory and visual effects, and any other potential effects.

- 3. The USACE shall further refine the general area of interest for a specific project under the Programs in the development of the Recommended Plan, as defined in Attachment B, defining the Program undertaking subject to Section 106 review under this PA, defining and documenting an Area of Potential Effect, carrying out initial efforts to identify historic properties as stated under Stipulation III.A.4 and initiating an assessment of the Program undertaking's potential effects to historic properties.
- 4. Before the selection of the Recommended Plan for a specific Program undertaking, the USACE shall complete initial background research of the study area to include reviewing available investigations and consulting with the applicable state historic preservation databases and/or inventories to determine and direct adequate survey coverage for historic, architectural, and archaeological properties, terrestrial and aquatic.
- 5. At any given time during the development of the Recommended Plan for a specific Program undertaking, the USACE may seek input from the Applicable Consulting Parties as appropriate.

B. DEFINE AND DOCUMENT THE AREA OF POTENTIAL EFFECTS

- 1. In consultation with Applicable Consulting Parties, the USACE shall identify and document the Area of Potential Effects (APE) appropriate to the scope and scale of the Recommended Plan for a specific Program undertaking as identified through Stipulation III.A and include the following:
 - i. The vertical and horizontal extents (i.e., height and depth), if available, of all construction activities required to complete the Program undertaking, including staging areas, access routes, and a reasonable buffer informed by consultation.
 - ii. Areas outside of the construction areas of the Program undertaking where the Program undertaking's potential direct, indirect, or cumulative effects to historic properties may be reasonably anticipated.
- 2. The USACE is responsible for defining and documenting a final APE, including any modification to the APE as a result of change in scope and scale of the Recommended Plan, for each Program undertaking subject to review under this PA.

C. HISTORIC PROPERTY IDENTIFICATION

- 1. The USACE shall complete and document historic property identification efforts and issue formal NRHP-eligibility determinations for all properties within the APE for the proposed Program undertaking as follows.
- 2. The USACE shall complete a literature search of the APE.

- i. The literature search shall include consulting the appropriate state historic inventory and archaeological site files, previous survey reports, historic contexts, and other pertinent documents of the appropriate state for information on previously developed historic contexts, recorded historic properties, and previously surveyed areas.
- ii. The USACE shall use the literature search to determine adequacy of existing documentation and to inform the scope of any additional research or surveys, including the need for additional historic context development and/or reevaluation of any previously identified historic properties or properties previously determined to be eligible for listing on the NRHP.
- 3. In accordance with appropriate state survey guidelines, implementation of historic property surveys and testing, the USACE shall record all properties meeting minimum criteria for recordation, such as buildings, structures, shipwrecks, objects, linear resources, landscapes, districts, Traditional Cultural Properties/Places, and archaeological/historical and burial sites. Recordation of structures, buildings, aquatic resources such as shipwrecks, objects, districts, and sites shall be prepared using the respective state recordation forms, as appropriate.
- 4. Pursuant to 36 CFR § 800.4(a)(4), historic property identification efforts shall include contacting the Tribal Historic Preservation Offices (THPOs), or other Tribal representative of Applicable Consulting Tribes for the Program undertaking, to assist in identifying properties within the APE, that may be of religious and cultural significance to them and may be eligible for listing on the NRHP.
- 5. The results of identification efforts, including any supporting documentation, shall be prepared in accordance with Stipulation II (Performance Standards and Qualifications).
- 6. The USACE shall make one of the following findings as a result of its historic property identification efforts:
 - i. "No Historic Properties Affected." If the USACE finds that either there are no historic properties identified within the APE or there are historic properties within the APE and the Program undertaking will have no effect upon them as defined in 36 CFR § 800.16(i) then the USACE shall make a "No Historic Properties Affected" finding and provide this finding, along with supporting documentation, in accordance with 36 CFR § 800.11(d), to the Applicable Consulting Parties for review and comment.
 - (1) For Program undertakings with a finding of "No Historic Properties Affected" the USACE shall provide the Applicable Consulting Parties information including the following:

- (a) A full description of the Program undertaking, to include depth and amount of ground disturbance, as well as above-ground effects, anticipated;
- (b) An APE map and narrative description of the APE for the Program undertaking;
- (c) A description of the steps taken, and justification for the level of effort, to identify historic properties within the APE;
- (d) Results of historic property identification efforts completed by the USACE, including an appropriate level of documentation, to include reports, forms, evaluations, eligibility determinations, or other documents supporting NRHP eligibility determinations;
- (e) Any photos, additional maps, images, or plans, as appropriate; and
- (f) A stated finding of "No Historic Properties Affected" for the Program undertaking and request for comment on said finding from the applicable SHPO(s).
- (2) The Applicable Federal Agencies and Consulting Tribes are under no obligation to provide comments on the finding. However, if they wish the USACE to consider their comments regarding the "No Historic Properties Affected" finding, they shall submit comments in writing within thirty (30) calendar days of receipt of the fully documented finding, unless a request for extension was submitted. The USACE shall take any comments received from Applicable Federal Agencies and Consulting Tribes into consideration before concluding the consultation and will notify the Applicable SHPO of these concerns and the USACE response to them. Any objection to the finding received will be addressed in accordance with Stipulation III.C.6.4 below.
- (3) The Applicable SHPO shall provide a response to a USACE finding within thirty (30) calendar days of receipt of a fully documented "No Historic Properties Affected" finding. If no comments or requests for an extension are received from the Applicable SHPO within the 30-day review period, the USACE will assume the SHPO has waived their opportunity to comment and has concurred with the finding.
- (4) If an Applicable Consulting Party objects to the finding of "No Historic Properties Affected" within the 30-day review period, the USACE shall consult with the objecting party, and include other parties as appropriate, for no more than a total of thirty (30) calendar days, or other time period as agreed to among Applicable Consulting Parties, upon receipt of the notification of objection to attempt to resolve concerns as identified by the objecting party.

- (a) The USACE may revise its finding of "No Historic Properties Affected." If the USACE revises its finding to "No Adverse Effect" for the specific Program undertaking, then the USACE shall continue consultation pursuant to Stipulation III.D.
- (b) If at the end of the thirty (30) calendar days, the objecting party(ies) concurs with the finding of "No Historic Properties Affected", the USACE shall document this concurrence, and USACE has no further obligations for the specific Program undertaking under this Stipulation.
- (c) If at the end of the thirty (30) calendar days, or agreed to specified time, the party(ies) objects to the finding of "No Historic Properties Affected" and the USACE has not altered its effects determination, the USACE shall notify the ACHP in accordance with Stipulation X.
- (5) If an Applicable Consulting Party(ies) disagrees regarding NRHP eligibility of a property identified within the APE for a Program undertaking, the USACE shall notify all Applicable Consulting Parties. The USACE shall consult with the Applicable Consulting Party(ies) for no more than thirty (30) days upon receipt of the notification to resolve the disagreement. The USACE shall provide copies of the notification to other Applicable Consulting Parties within five (5) days of receipt. Upon request and at its discretion, the USACE may extend the consultation period to resolve the disagreement.
 - (i) If the dispute cannot be resolved, or if the ACHP or Secretary of the Interior so requests, the USACE shall obtain a determination of eligibility from the Keeper of the NRHP. The Keeper's determination will be final in accordance with 36 CFR Part 63.4.
- (6) If the USACE does not carry out the Program undertaking as documented in the "No Historic Properties Affected" finding, then the USACE shall continue consultation in accordance with Stipulation III.C.
- ii. If the USACE finds that there are historic properties identified within the APE which may be affected by the Program undertaking, then the USACE shall proceed to Stipulation III.D.

D. ASSESSMENT OF POTENTIAL ADVERSE EFFECTS TO HISTORIC PROPERTIES

1. Avoidance of adverse effects to historic properties is the preferred treatment approach. The USACE shall consider redesign of components of the Program undertakings to avoid potential adverse effects to historic properties. However, there may be instances where it is not feasible for the USACE to redesign Program undertakings to avoid adverse effects to historic properties.

- 2. The USACE shall assess potential adverse effects caused by the proposed Program undertaking on all identified historic properties within the APE. This assessment shall include consideration of all direct, indirect, and cumulative effects caused by the Program undertaking, and shall use the criteria of adverse effects (36 CFR § 800.5(a)(1)). The USACE shall make one of the following determinations:
 - i. "No Adverse Effect to Historic Properties." If the USACE determines that historic properties present in the APE will be affected by the Program undertaking but the characteristics of the historic properties that qualify the properties for inclusion are not diminished or altered, then the USACE shall make a "No Adverse Effect to Historic Properties" finding and provide this finding, along with supporting documentation, in accordance with 36 CFR § 800.11(e), to the Applicable Consulting Parties for review and comment in accordance with Stipulation III.D.3.
 - ii. "Adverse Effect to Historic Properties." If the USACE determines that historic properties present in the APE will be affected by the Program undertaking and the characteristics of the historic properties that qualify them for inclusion will be diminished or altered, then the USACE shall make an "Adverse Effect to Historic Properties" finding and provide this finding, along with supporting documentation, in accordance with 36 CFR § 800.11(e), to the Applicable Consulting Parties for review and comment in accordance with Stipulation III.D.4.

3. No Adverse Effect to Historic Properties

- i. For Program undertakings with a finding of "No Adverse Effect to Historic Properties" the USACE shall provide the Applicable Consulting Parties with the following:
 - (1) A full description of the Program undertaking, to include depth and amount of ground disturbance, as well as above-ground effects, anticipated;
 - (2) An APE map and narrative description of the APE for the Program undertaking;
 - (3) A description of the steps taken, and justification for the level of effort, to identify historic properties within the APE;
 - (4) Results of historic property identification efforts completed by the USACE, including an appropriate level of documentation to include reports, forms, evaluations, eligibility determinations, or other documents supporting NRHP eligibility determinations;

- (5) A description of the affected historic properties including information on the characteristics that qualify them for the NRHP;
- (6) A description of the Program undertaking's potential effects on the identified historic properties and explanation of why the criteria of adverse effect were found applicable or inapplicable;
- (7) Any photos, additional maps, images, or plans, as appropriate; and
- (8) A stated finding of "No Adverse Effect to Historic Properties" for the Program undertaking and request for comment for said finding from the Applicable SHPO.
- ii. The Applicable Federal Agencies and Consulting Tribes are under no obligation to provide comments on the finding of "No Adverse Effect to Historic Properties". However, if they wish the USACE to consider their comments regarding the finding of effect, Applicable Federal Agencies or Consulting Tribes shall submit comments in writing within thirty (30) calendar days of receipt. The USACE shall take any comments received into consideration before concluding the consultation and will notify the applicable SHPO of these concerns and the USACE response to them. Objections shall be addressed in accordance with Stipulation III.D.3.v. below.
- iii. The Applicable SHPO shall provide a response to a USACE finding within thirty (30) calendar days of fully documented "No Adverse Effect to Historic Properties" finding. If no comments or a request for an extension are received within the 30-day review period, the USACE will assume SHPO has waived their ability to comment and has concurred.
- iv. If the Applicable SHPO concurs with the "No Adverse Effect to Historic Properties" finding for a specific Program undertaking, the USACE shall first determine if any other party has objected to the finding, and if there are no objections, the USACE has no further obligations under this Stipulation.
- v. If an Applicable Consulting Party(ies) objects to the finding of "No Adverse Effect to Historic Properties," the USACE shall consult with the objecting party (ies), and include other parties as appropriate, for no more than a total of thirty (30) calendar days, upon receipt of the notification of non-concurrence to attempt to resolve concerns as identified by the objecting party.
 - (1) The USACE may revise its finding of "No Adverse Effect to Historic Properties." If the USACE revises its finding to "No Historic Properties Affected," then the USACE shall continue consultation pursuant to Stipulation III.C.5.i. If the USACE revises its finding to "Adverse Effect," then the USACE shall continue consultation pursuant to Stipulation III.D.4.

- (2) If at the end of the thirty (30) calendar days, the objecting party concurs with the finding of "No Adverse Effect to Historic Properties," the USACE shall document this concurrence, and the USACE has no further obligations under this Stipulation for the specific Program undertaking.
- (3) If at the end of the thirty (30) calendar days, the objecting party(ies) still objects to the finding of "No Adverse Effect to Historic Properties", and the USACE has not altered its effects determination, the USACE shall notify the ACHP in accordance with Stipulation X.
- vi. If the USACE does not carry out the Program undertaking as documented in the "No Adverse Effect" finding, then the USACE shall continue consultation in accordance with Stipulation III.C.

4. Adverse Effect to Historic Properties

- i. For a specific Program undertaking with a finding of "Adverse Effect to Historic Properties," the USACE shall provide the Applicable Consulting Parties with the following:
 - (1) A full description of the Program undertaking, to include depth and amount of ground disturbance, as well as above-ground effects, anticipated;
 - (2) An APE map and narrative description of the Program undertaking;
 - (3) A description of the steps taken, and justification for the level of effort, to identify historic properties within the APE;
 - (4) Results of historic property identification efforts completed by the USACE, including an appropriate level to include reports, forms, evaluations, eligibility determinations, or other documents of documentation supporting NRHP eligibility determinations;
 - (5) A description of the affected historic properties including information on the characteristics that qualify them for the NRHP;
 - (6) A description of the Program undertaking's potential effects on the historic properties and an explanation of why the criteria of adverse effect were found applicable or inapplicable;
 - (7) Any photos, additional maps, images, or plans, as appropriate;
 - (8) A stated finding of "Adverse Effect to Historic Properties" and request for comment for said finding from the Applicable SHPO.

ii. The USACE shall consult with the Applicable Consulting Parties to resolve the "Adverse Effect to Historic Properties" pursuant to Stipulation III.E.

E. RESOLUTION OF ADVERSE EFFECTS

- 1. The USACE shall notify Applicable Consulting Parties, and the public, upon receiving Applicable SHPO concurrence on a finding of "Adverse Effect to Historic Properties" for a Program undertaking using the following process:
 - i. For public awareness, the USACE shall post a notice of the "Adverse Effect to Historic Properties" finding on the official USACE website for the involved District to include a description of the Program undertaking, a list of identified historic properties, the explanation for the finding of adverse effects, steps taken or considered by the USACE to avoid or minimize the adverse effects, any Applicable Consulting Party comments received by the USACE regarding the undertaking, and an invitation to provide written comment within thirty (30) calendar days of posting to the website.
 - ii. Consulting Parties are under no obligation to provide comments on the finding of adverse effect. However, if they wish the USACE to consider their comments regarding the finding of adverse effect, Consulting Parties shall submit comments in writing within thirty (30) calendar days of receipt. The USACE shall take any comments received into consideration before concluding the consultation and will notify the Applicable Consulting Parties of any concerns and the USACE response to those concerns.
- 2. The USACE shall consult with the Applicable Consulting Parties to determine appropriate avoidance, minimization and/or mitigation measures to resolve the adverse effect. The USACE shall offer to facilitate a consultation meeting, to include Applicable Consulting Parties, within thirty (30) calendar days after notification of an adverse effect finding, to discuss Program undertaking alternatives to avoid, minimize, or mitigate the adverse effects, and may schedule additional meetings at its discretion.
- 3. If through consultation with Applicable Consulting Parties, the USACE modifies the Program undertaking to avoid adverse effects to historic properties within the APE, the USACE shall document the alternatives utilized to eliminate the potential adverse effects of the proposed Program undertaking resulting in a revised finding of "No Adverse Effect to Historic Properties," which must receive concurrence from the Applicable Consulting Parties pursuant to Stipulation III.D.3. Once concurrence is achieved, the USACE has no further obligations under this Stipulation for the specific Program undertaking.
- 4. If through consultation with the Applicable Consulting Parties, the USACE reaches agreement to appropriately resolve the adverse effects through minimization and/or mitigation measures then the measures agreed to by the USACE and the Applicable

Consulting Parties shall be specified in a Memorandum of Agreement (MOA) developed and executed for the Program undertaking in accordance with 36 CFR § 800.6(b)(1) and 800.6(c) and filed with the ACHP upon execution.

- i. If any agreed-upon minimization and/or mitigation measure included in the final MOA involves archaeological data recovery or historic property documentation, then ground-disturbing activities or activities resulting in adverse effects to historic properties associated with the Program undertaking may not begin until after the adequate completion of the fieldwork for the data recovery or historic property documentation and the USACE has provided written notification in this regard.
- ii. It is understood the USACE shall not complete archaeological data recovery while lands are under private ownership and mitigation of the adverse effect is not complete until the final draft of the data recovery report has been filed with and recommended for acceptance by the Applicable SHPO and other Applicable Consulting Parties as agreed-upon in the final MOA.
- 5. If through consultation with the Applicable Consulting Parties, the USACE cannot reach agreement to appropriately resolve adverse effects through minimization and/or mitigation measures, the USACE will notify the ACHP and seek a formal resolution in accordance with 36 CFR § 800.6(b)(2). The ACHP will only participate in the resolution of adverse effects for individual Program undertakings if a written request is received from the USACE or Applicable Consulting Party.

IV. SUBSEQUENT AGREEMENTS

A. Memoranda of Agreements developed to resolve adverse effects for specific Program undertakings under the Programs shall be negotiated between the respective USACE District (St. Paul, Rock Island, St. Louis), Applicable Consulting Parties, and ACHP, pursuant to 36 CFR § 800.6(c), and shall be independent of this PA.

V. REVIEW AND MONITORING OF PA IMPLEMENTATION

A. The purpose of the PA review and monitoring is to ensure the USACE identification and protection of historic properties in carrying out Program undertakings. This is accomplished through the review of Program undertakings that were completed during a reporting period and review of implementation of the PA. Electronic mail (email) will serve as the official correspondence method for all communications regarding this PA and its provisions. See Attachment D for a list of contacts and email addresses. Attachment D may be updated as needed without an amendment to this PA. It is the responsibility of each Consulting Party to inform a respective USACE District of any change in name, email address, or phone number of any point-of-contact listed in this PA. Following any updates to Attachment D, the USACE shall provide this information to all Consulting Parties. In order to foster cooperative relations as the terms of this PA are carried out, the USACE shall:

- 1. Beginning on the one-year anniversary of the execution of this PA, and on an annual basis thereafter, compile and distribute a report to Consulting Parties on the implementation of the terms of this PA.
- 2. Invite Consulting Parties to a review meeting every two (2) years. If it is agreed that such a meeting is not necessary at that time, the meeting may be waived. Meetings may be conducted in any mutually agreeable location and/or format, including inperson, video conferencing, or teleconferencing. The USACE shall remain responsible for initiating the biennial meetings in subsequent years. More frequent meetings may be appropriate based on specific circumstances and therefore an alternative meeting schedule may be established.

VI. CURATION

- A. All records and materials resulting from the actions required by this PA shall be curated to the extent provided by law in accordance with 36 CFR Part 79, Curation of Federally Owned or Administered Archeological Collections, except those materials identified as Native American human remains and items associated with Native American burials which would be subject to Stipulation IX.
- B. Subject to Stipulation VI and consistent with the USACE's property interest, the USACE or its contractors, in accordance with 36 CFR Part 79, will maintain all archaeological items and materials collected until any specified analyses and reviews are complete.
- C. It is USACE policy that archaeological items and materials, not associated with human remains or burials, recovered from lands other than USACE fee-title, are the property of the respective landowner including private, state, federal, and other locally owned lands.

VII. CONFIDENTIALITY

- A. The USACE shall seek and consider the views of the public in a manner that reflects the nature of the Program undertakings and their effects on historic properties following procedures pursuant to 36 CFR § 800.2(d) and in a manner that observes confidentiality requirements pursuant to Section 304 of the NHPA (54 U.S.C. 307103); Section 9 of the Archaeological Resources Protection Act (16 U.S.C. 470hh); and Section 552(b) of the Freedom of Information Act (5 U.S.C. 552) and applicable state laws.
- B. The nature and location of archaeological sites and any other cultural resources discussed in this PA shall be considered confidential as provided for in 36 CFR § 800.11(c). The USACE shall use best efforts to protect sensitive information from disclosure as requested by Applicable Consulting Parties to the extent permitted by federal and applicable state laws identified in VII.A above.

VIII. POST-REVIEW DISCOVERIES

- A. The USACE shall ensure that previously unidentified historic properties, or unanticipated effects to previously identified historic properties, discovered during the construction activities for Program undertakings are subject to the requirements of 36 CFR § 800.13(b-d). Discoveries of previously unidentified historic properties or unanticipated adverse effects to known historic properties is not anticipated. However, if this were to occur, the USACE shall ensure the following measures are met. USACE shall implement the provisions outlined below that are intended to ensure that Program undertakings are in compliance with applicable federal and state laws and regulations. These provisions will be included in all construction, operations, and maintenance plans.
 - 1. The contractor will be instructed to cease all ground-disturbing activities in the area of the historic property, as well as within a 100-foot radius around but within the project footprint, to avoid and/or minimize harm to the property.
 - 2. The contractor will be instructed to immediately notify the USACE of the discovery and implement interim measures, as appropriate, to protect the discovery from damage, looting, and vandalism, such as protective fencing and covering of the discovery with appropriate materials.
 - 3. The USACE will inspect the work site to determine the extent of the discovery and ensure work activities have halted within the 100-foot radius.
 - 4. The USACE will clearly mark the area of discovery and implement additional measures such as security, as appropriate, to protect the discovery from theft and vandalism.
 - 5. The USACE shall provide an initial assessment of the resource's condition and eligibility to Applicable Consulting Parties and notify other Consulting Parties, if applicable, of the discovery within seven (7) calendar days.
- B. If USACE, after consultation with Applicable Consulting Parties, determines the discovery is not a historic property as it is either isolated, does not retain integrity sufficient for listing on the NRHP, or if the historic property will not be further disturbed by construction activities, construction may resume within the 100-foot radius.
- C. If USACE determines that the discovery is a historic property that is, or may be, eligible for listing on the NRHP, the USACE shall consult with Applicable Consulting Parties, regarding appropriate measures for site treatment pursuant to 36 CFR 800.6(a). Consulting Parties have ten (10) days to provide their comments on the proposed measures which may include:
 - 1. Formal evaluation of the historic property;
 - 2. Exploration of potential alternatives to avoid the historic property;

- 3. If the historic property will be adversely affected by project activities, preparation and implementation of a mitigation plan by USACE to resolve adverse effects in consultation with Applicable Consulting Parties.
- D. The notified Applicable Consulting Parties have ten (10) days following notification to provide comment regarding NRHP eligibility determination of the discovery.
- E. USACE shall prepare a report of findings describing the background history leading to and immediately following the reporting and resolution of an inadvertent discovery within thirty (30) days of the resolution for each inadvertent discovery.
- F. USACE shall communicate the procedures to be observed to its contractors and personnel.
- G. USACE shall provide a Notice to Proceed to the contractor to work in the area. Notices to Proceed may be issued by USACE for individual construction segments, defined by USACE in its construction specifications, after the identification and evaluation of historic properties and resolution of adverse effects has been completed.

IX. TREATMENT OF HUMAN REMAINS AND ITEMS OF RELIGIOUS AND CULTURAL IMPORTANCE

- A. Under this PA, no investigative surveys or construction activities will be planned to knowingly disturb human remains, funerary objects, sacred objects, or objects of cultural patrimony. If any potential unmarked human burials or skeletal remains are encountered during construction activities, all ground disturbing activities will cease. Should any potential findings be made, field personnel will follow instructions provided by USACE for each project to initiate identification, evaluation, and consultation efforts as outlined below.
- B. If human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during field investigations or laboratory work or during construction activities, the USACE will comply with the provisions based on the nature of the land ownership at the time remains or objects are encountered.
 - 1. The USACE will immediately notify appropriate law enforcement, appropriate medical examiner or coroner, the state archaeologist, Applicable SHPO, Applicable Consulting Tribes, and landowner within twenty-four (24) hours, or as soon as otherwise practicable, via email or telephone.
 - i. The notification process will follow the state law appropriate for the location of the discovery:
 - (1) Iowa per Code of Iowa 263B, Office of the State Archaeologist
 - (2) Illinois per The Human Skeletal Remains Protection Act (20 ILCS 3440)

- (3) Minnesota per Statutes Section 307.08, Office of the State Archaeologist and the Minnesota Indian Affairs Council
- (4) Missouri Unmarked Human Burials Law (RSMo Chapter 194) and Missouri Cemeteries Law (RSMo Chapter 214); and/or
- (5) Wisconsin per Statutes Section 157.70 and Wisconsin Administrative Code HS2, Wisconsin Burial Site Preservation Office
- 2. The USACE will require that all work will immediately cease within a 165-foot radius from the point of discovery and require that the contractor secure the area by placing pin flags within the work area radius around the discovery, and following other appropriate measures directed by USACE to protect the discovery from further disturbance. The USACE shall consult with the Applicable Consulting Parties regarding additional steps to be followed. All human remains, regardless of ancestry, will be treated with dignity and respect.
- 3. If the human remains, funerary objects, sacred objects, or objects of cultural patrimony appear to be Native American, the USACE, or the landowner, if located on private land, may be required to meet applicable federal, tribal, and state burial laws and ordinances. When on federal or tribal lands, the USACE will meet applicable requirements of the Native American Graves Protection and Repatriation Act for all Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony on a case-by-case basis, in accordance with 43 CFR Part 10.
- 4. If not on federal or tribal lands, the USACE shall notify appropriate authorities and work with the landowner and state to comply, as appropriate, with
 - i. Code of Iowa 263B.
 - ii. 20 Illinois Compiled Statue 3440
 - iii. Minnesota Statutes Section 307.08,
 - iv. Revised Statues of Missouri Chapters 194 and 214
 - v. Wisconsin Statutes Section 157.70 and Wisconsin Administrative Code HS2.
- 5. Measures to protect the human remains and any associated artifact(s) will remain in effect until an appropriate treatment plan for the discovery (if applicable) has been completed for the remains and associated artifacts. The USACE will consider redesign of undertakings to avoid effects to human remains and any associated artifacts(s). The contractor will not resume work in the vicinity of the find until the USACE has granted clearance to do so.
- 6. Where suspected burial sites in the absence of human remains are encountered, the USACE or its contractor will comply, as applicable, with
 - i. Code of Iowa 263B,
 - ii. 20 Illinois Compiled Statue 3440
 - iii. Minnesota Statutes Section 307.08,
 - iv. Revised Statues of Missouri Chapters 194 and 214, and/or
 - v. Wisconsin Statutes Section 157.70 and Wisconsin Administrative Code HS2

X. DISPUTE RESOLUTION

- A. Should a Consulting Party to this PA object in writing regarding implementation of this PA, the USACE shall consult with the objecting party for no more than thirty (30) calendar days. The USACE shall provide copies of the written objection to other Consulting Parties within five (5) calendar days of receipt of the written objection. Upon request, the USACE shall make every effort to extend the consultation period, subject to mission requirements.
 - 1. The USACE shall take into account the reasons for the objection and evaluate the solutions suggested by the objecting party.
 - 2. If, after the thirty (30)-calendar-day review period, the USACE determines that the objection cannot be resolved, the USACE shall forward all documentation relevant to the dispute, including the USACE proposed resolution, to the ACHP.
 - i. The ACHP shall provide the USACE with its advice on the resolution of the objection within thirty (30) calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP and other Consulting Parties. The USACE shall provide Consulting Parties with a copy of this written response. The USACE will then proceed according to its final decision.
 - ii. If the ACHP does not provide its advice regarding the dispute within the thirty (30) calendar-day time period, the USACE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the signatories to the PA. The USACE shall provide Consulting Parties with a copy of this written response. The USACE will then proceed according to its final decision and notify Consulting Parties.
- B. The USACE responsibilities to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.
- C. Should any member of the public raise a timely and substantive objection pertaining to the manner in which the terms of this PA are carried out, at any time during its implementation, the USACE shall take the objection into account by consulting with the objector. When the USACE responds to an objection, it shall notify the Consulting Parties of the objection and the manner in which it was resolved. The USACE may request the assistance of a Consulting Party to resolve an objection.

XI. SEVERABILITY

- A. If any section, subsection, paragraph, sentence, clause, or phrase in this PA, for any reason, is held to be unconstitutional or invalid or ineffective, such decision shall not affect the validity or effectiveness of the remaining portions of this PA.
- B. If any section, subsection, paragraph, sentence, clause, or phrase in this PA, for any reason, is held to be unconstitutional or invalid or ineffective, the signatories shall consult to determine whether an amendment to this PA is needed.

XII. ANTI-DEFICIENCY PROVISION

- A. All parties to this agreement acknowledge the USACE fiduciary responsibilities pursuant to the Anti-Deficiency Act (31 USC 1341). All obligations on the part of the USACE under this PA shall be subject to the appropriations, allocation, and availability of sufficient funds available to the USACE for such purposes.
- B. The legal responsibility of the USACE to comply with Section 106 of the NHPA is not affected by the availability of federal funding provided through appropriation.

XIII. AMENDMENTS

- A. Any signatory to this PA may at any time propose amendments, whereupon all signatories shall consult to consider such amendment for no more than ninety (90) days. An amendment will be effective on the date a copy signed by all signatories is filed with the ACHP.
- B. Any Consulting Tribe may update its consultation area in Attachment C without an amendment to this PA through notice to the respective USACE district. USACE will distribute the updated consultation area to all Consulting Parties.

XIV. TERMINATION OR WITHDRAWAL

- A. If the USACE or the ACHP determines that the terms of this PA will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation XIII, above. If within ninety (90) calendar days (or another time period agreed to by all signatories) an amendment cannot be reached, the USACE or the ACHP may terminate the PA upon written notification to the other signatories.
 - 1. Once the PA is terminated, the USACE must review all undertakings identified post termination in accordance with 36 CFR § 800.3 through 800.7 or an applicable alternative under 36 CFR § 800.14. The USACE will include this in a final annual report per Stipulation V.

- B. Any SHPO may terminate this PA as to its jurisdiction after providing the USACE written notice ninety (90) calendar days prior to termination.
 - 1. The USACE shall consult with the terminating SHPO to identify any mutually acceptable measures that would avoid the party's termination.
 - 2. If mutually acceptable measures are identified that would require amendment to the PA, the USACE shall follow the amendment process outlined in Stipulation XIII.
 - 3. If within ninety (90) calendar days (or another time period agreed to by all signatories) mutually acceptable measures are not identified or an amendment cannot be reached, and the SHPO terminates, the PA will no longer apply within that SHPO's state, and the USACE will review all Program undertakings previously subject to this PA in that jurisdiction in accordance with 36 CFR § 800.3 through 800.7 or an applicable alternative under 36 CFR § 800.14, which may include entry into subsequent MOAs and/or PAs.
 - 4. This PA will remain in effect in all other jurisdictions and for all other parties.
- C. The USFWS and/or NPS may terminate the PA or withdraw as a Signatory/Invited Signatory after providing the USACE written notice ninety (90) calendar days prior to termination or withdrawal.
 - 1. The USACE shall consult with the USFWS or NPS, as applicable, to identify any mutually acceptable measures that would avoid the termination or the party's withdrawal, as applicable.
 - 2. If mutually acceptable measures are identified that would require an amendment to the PA, the USACE will follow the amendment process outlined in Stipulation XIII.
 - 3. If within ninety (90) calendar days (or another time period agreed to by all signatories) mutually acceptable measures are not identified or an amendment cannot be reached, the USFWS or NPS, as applicable, may terminate the PA upon written notification to the other signatories, or withdraw from the PA. If the USFWS or NPS, as applicable, terminates the PA, USACE will follow Stipulation XIV.A.1. If the USFWS or NPS, as applicable, withdraws, the PA will remain in full force and effect.
- D. Any Invited Signatory Tribe may withdraw as an Invited Signatory or terminate the PA as to its consultation area after providing the USACE written notice ninety (90) calendar days prior to withdrawal or termination.
 - 1. The USACE shall consult with the withdrawing or terminating Invited Signatory Tribe to identify any mutually acceptable measures that would avoid the party's withdrawal or termination.

- 2. If mutually acceptable measures are identified that would require amendment to the PA, the USACE shall follow the amendment process outlined in Stipulation XIII.
- 3. If within ninety (90) calendar days (or another time period agreed to by all signatories) mutually acceptable measures are not identified or an amendment cannot be reached and an Invited Signatory Tribe withdraws, the USACE will continue to consult with the former Invited Signatory Tribe as a Consulting Tribe under the terms of this PA, and the PA will continue in full force and effect, including within the former Invited Signatory Tribe's consultation area. If within ninety (90) calendar days (or another time period agreed to by all signatories) mutually acceptable measures are not identified or an amendment cannot be reached and an Invited Signatory Tribe terminates as to its consultation area, the PA will no longer apply within that consultation area, and the USACE will review all Program undertakings previously subject to this PA in that consultation area in accordance with 36 CFR § 800.3 through 800.7 or an applicable alternative under 36 CFR § 800.14, which may include entry into subsequent MOAs and/or PAs. This PA will remain in effect in all other jurisdictions and for all other parties. The remaining Signatories may confer on whether additional amendment to the PA is warranted to address the termination by the Invited Signatory Tribe.

XV. DURATION

This PA shall remain in effect for ten (10) years, until March 18, 2034, and can be extended through amendment in accordance with Stipulation XIII. Prior to March 18, 2028 the USACE shall host a workshop for a four (4)-year review and assessment of the effectiveness of this PA.

XVI. IMPLEMENTATION

- A. This PA may be executed in counterparts, with a separate page for each signature.
- B. This PA shall become effective within the applicable state on the date of signature, whichever is latest, by the USACE, applicable SHPO or the ACHP.
- C. The USACE shall ensure each consulting party is provided with a complete copy of the final PA and that the final PA and any amendments are filed with the ACHP.

XVII. EXECUTION

Execution of this PA by the St. Paul, Rock Island, and St. Louis Districts of the USACE, the IaSHPO, the IISHPO, the MnSHPO, the MoSHPO, the WiSHPO, the USFWS, the NPS, the ACHP, The Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, the Miami Tribe of Oklahoma, the Peoria Tribe of Indians of Oklahoma, the Quapaw Nation, and The Osage Nation and implementation of its terms is evidence that the USACE has taken into account the effects of its undertaking on historic properties and has afforded the ACHP opportunity to comment pursuant to Section 106 of the NHPA.

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
THE U.S. FISH AND WILDLIFE SERVICE,
THE NATIONAL PARK SERVICE,
THE NATIONAL PARK SERVICE,
THE MIAMI TRIBE OF OKLAHOMA,
THE MIAMI TRIBE OF OKLAHOMA,
THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
THE QUAPAW NATION,
THE OSAGE NATION, AND

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY UNITED STATES ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT

Digitally signed by SWENSON.ERIC.RAYMOND.1032271894 Date: 2024.03.28 14:26:54 -10'00'

_. Date: _ 28 March 2024

Colonel Eric R. Swenson, St. Paul District Commander

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY

UNITED STATES ARMY CORPS OF ENGINEERS, ROCK ISLAND DISTRICT

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CURRY.JESSE.THOMAS.1086509969 Date: 2024.04.02 12:46:17 -05'00'

. Date: 02 April 2024

Colonel Jesse T. Curry, Rock Island District Commander

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE NATIONAL PARK SERVICE,
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THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY				
UNITED STATES	ARMY CORPS	S OF ENGINEER	RS, ST. LOUIS	S DISTRICT

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PH.1090474134 Date: 2024.03.22 13:20:53 -05'00'

Date:

Colonel Andy J. Pannier, St. Louis District Commander

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
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THE QUAPAW NATION,
THE OSAGE NATION, AND

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY: IOWA STATE HISTORIC PRESERVATION OFFICE		
Heather Gibb	Date:	

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY:		
ILLINOIS STATE HISTORIC PRESEI	RVATION OFFICE	
Carey L. Mayer		
Carey Mayer, Deputy State Historic Pre	eservation Officer	

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE MATCH-E-BE-NASH-SHE-WISH BAND OF POTTAWATOMI INDIANS
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THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
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THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

. Date: 4/9/2024.

SIGNATORY:

MINNESOTA STATE HISTORIC PRESERVATION OFFICE

Amy H. Spong, Deputy State Historic Preservation Officer

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY:

MISSOURI STATE HISTORIC PRESERVATION OFFICE

Brik. De

Brian Stith, Deputy Director Division of State Parks and Deputy Missouri State Historic Preservation Officer

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY:			
WISCONSINSTATE HISTORIC PRESERVATION	OFFICE		
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Daina Penkiunas, State Historic Preservation Officer

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

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UNITED STATES FISH AND WILDLIFE SERVICE

WILLIAM MEEKS

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. Date:

Will Meeks, Midwest Regional Director

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

SIGNATORY:			
ADVISORY COUNCIL ON HISTORIC PRESERVATION			
A. / /			
Much	. Date:	June 25, 2024	

Reid Nelson, Executive Director

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

. Date:	

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
THE U.S. FISH AND WILDLIFE SERVICE,
THE NATIONAL PARK SERVICE,
THE MATCH-E-BE-NASH-SHE-WISH BAND OF POTTAWATOMI INDIANS
THE MIAMI TRIBE OF OKLAHOMA,
THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

INVITED SIGNATORY:	
THE MATCH-E-BE-NASH-SHE-WISH BAND OF	POTTAWATOMI INDIANS
Helissa Brown	r 2 21
MEUSSA DIOU	Date:

Melissa Brown, Senior Director of Operations

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

INVITED SIGNATORY: MIAMI TRIBE OF OKLAHOMA

Digitally signed by Douglas Lankford
Date: 2024.05.03 11:50:27 -05'00'

<u>.</u> Date: _____

Chief Douglas Lankford

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
THE U.S. FISH AND WILDLIFE SERVICE,
THE NATIONAL PARK SERVICE,
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THE MIAMI TRIBE OF OKLAHOMA,
THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

INVITED SIGNATORY: OUAPAW NATION

Wina Supernour . Date: 4/20/2024.

Wena Supernaw, Chair

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
THE QUAPAW NATION,
THE OSAGE NATION, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

INVITED SIGNATORY:

Geoffrey M. Standing Bear, Principle Chief

THE OSAGE NATION

<u>_.</u> Dat

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THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
IOWA, ILLINOIS, MINNESOTA, MISSOURI, AND WISCONSIN,
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THE OSAGE NATION, AND
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REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

INVITED SIGNATORY:			
THE PEORIA TRIBE OF INDIANS OF OKLAHOMA			
414-	. Date:	5/2/24	
Chief Craig Harver			

THE U.S. ARMY CORPS OF ENGINEERS, ST. PAUL,
ROCK ISLAND, AND ST. LOUIS DISTRICTS,
THE STATE HISTORIC PRESERVATION OFFICERS OF
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THE MIAMI TRIBE OF OKLAHOMA,
THE PEORIA TRIBE OF INDIANS OF OKLAHOMA,
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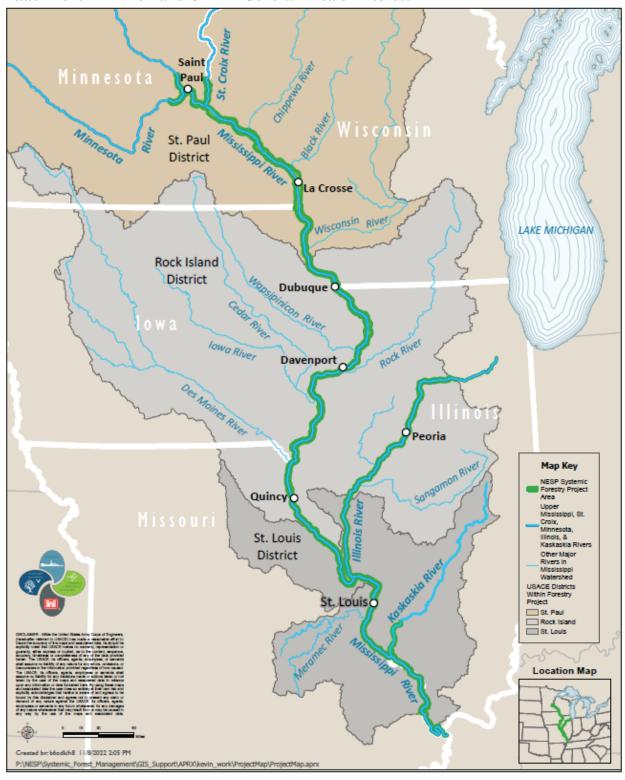
REGARDING

The Upper Mississippi River Restoration Program Habitat Rehabilitation and Enhancement Projects and the Navigation and Ecosystem Sustainability Program

CONCURRING:	
IOWA TRIBE OF KANSAS AND NEBRASKA	
alan Kelley	Date: <u>04.03.202</u> 4

Alan Kelley, Deputy Tribal Historic Preservation Officer

Attachment A - NESP and UMRR General Area of Interest



Attachment B: Definitions

Attachment b	. Definitions
Tentatively	Under Engineer Regulation ER_1105-2-61, the tentatively selected plan is the
Selected Plan	single alternative chosen from all those considered during the feasibility study and
	identified in the draft feasibility report/NEPA report released to the public for
	review. The tentatively selected plan usually becomes the recommended plan after
	agency endorsement.
Recommended	Under Engineer Regulation ER_1105-2-100, the recommended plan is the plan
Plan	proposed in the final decision document for implementation.
Area of	Under 36 CFR § 800.16(d) the geographic area or areas within which an
Potential Effect	undertaking may directly or indirectly cause alterations in the character or use of
(APE)	historic properties, if any such properties exist. The area of potential effects is
	influenced by the scale and nature of an undertaking and may be different for
	different kinds of effects caused by the undertaking.
Signatory	In accordance with 36 CFR § 800.6(c)(1), a Signatory has the authority to execute,
	amend, or terminate the Programmatic Agreement.
Invited	In accordance with 36 CFR § 800.6(c)(2), Invited Signatories who sign the
Signatory	Programmatic Agreement are signatories with the authority to amend and terminate
	the Programmatic Agreement.
Concurring	In accordance with 36 CFR § 800.6(c)(3), a Concurring Party is a Consulting Party
Party	invited to concur in the Programmatic Agreement but does not have the authority to
	amend or terminate the Programmatic Agreement.
Technical work	In this PA means all efforts to identify and delineate, evaluate historic,
	architectural, and archaeological properties, and to assess potential adverse effects,
	and perform subsequent treatment of historic properties, such as avoidance,
	minimization, data recovery excavation, monitoring, or recordation of potential
	historic properties that is required under this PA.

Attachment C. Provided Tribal Consultation Areas

Tribe	Consultation Area by County				
	Illinois	lowa	Minnesota	Missouri	Wisconsin
The Match-E- Be-Nash-She- Wish Band of Pottawatomi Indians	Adams, Brown, Calhoun, Champaign, Madison, Monroe, Pike, and Saint Clair in MVS*	Clinton, Des Moines, Lee, Louisa, Muscatine, Scott	N/A	St. Charles, St. Louis, and St. Louis City in MVS*	Grant
The Miami Tribe of Oklahoma	All MVS*	N/A	N/A	Boone, Callaway, Cape Girardeau, Franklin, Gasconade, Jefferson, Lincoln, Marion, Mississippi, Montgomery, Osage, Perry, Pike, Ralls, St. Charles, St. Louis City, St. Louis Co., Ste. Genevieve, Scott, and Warren in MVS*	N/A
The Osage Nation	All MVS* and Adams, Boone, Brown, Bureau, Calhoun, Carroll, Cass, Champaign, Christian, De Witt, Fulton, Hancock, Henderson, Henry, Jo Daviess, Knox, Lee, Logan, Macon, Macoupin, Marshall, Mason, Menard, Mercer, Montgomery, Morgan, Moultrie, Ogle, Peoria, Piatt, Pike, Putnam, Rock Island, Sangamon, Schuyler, Shelby, Stark, Stephenson, Tazewell, Warren, Whiteside, Winnebago, and Woodford Counties in MVR*	Clinton, Des Moines, Henry, Jackson, Lee, Louisa, Muscatine, Scott, and Van Buren Counties	N/A	All MVS* and Adair, Clark, Knox, Lewis, Marion, Monroe, Ralls, Schuyler, Scotland, and Shelby Counties in MVR*	N/A

The Peoria Tribe of Indians in Oklahoma	Adams, Alexander, Calhoun, Carroll, Hancock, Henderson, Jackson, Jersey, Jo Daviess, Madison, Mercer, Monroe, Pike, Randolph, Rock Island, St. Clair, Union, and Whiteside Counties	All MVR*	All MVP*	All MVR*and MVS*	All MVP* and MVR*
Quapaw Nation	Alexander, Jackson, Johnson, Madison, Monroe, Pulaski, Randolph, St. Clair, and Union Counties	N/A	N/A	Bollinger, Butler, Cape Girardeau, Iron, Jefferson, Madison, Mississippi, Perry, Reynolds, St. Charles, Ste. Genevieve, St. Francois, St. Louis, St. Louis City, Scott, and Wayne Counties	N/A

^{*}MVP is the St. Paul District, MVR is the Rock Island District, and MVS is the St. Louis District.

Attachment D: Consulting Party Distribution List (January 2024)

Agency and/or Tribe	Name	Title	Email
Iowa State Historic		State Historic	heather.gibb@iowa.gov
Preservation Office	Dr. Heather Gibb	Preservation Officer	
Illinois State Historic		State Historic	jeff.kruchten@illinois.gov
Preservation Office	Mr. Jeffrey Kruchten	Preservation Officer	
Minnesota State Historic		Deputy State Historic	amy.spong@state.mn.us
Preservation Office	Amy Spong	Preservation Officer	
Missouri State Historic		Review, Compliance,	amy.rubingh@dnr.mo.gov
Preservation Office	Ms. Amy Rubingh	Records Coordinator	
Wisconsin State Historic		State Historic	tyler.howe@wisconsinhistory.org
Preservation Office	Mr. Tyler Howe	Preservation Officer	
		Superintendent – Effigy	Susan_Snow@nps.gov
		Mounds National	
National Park Service	Ms. Susan Snow	Monument	
		Refuge Manager/Area	sabrina_chandler@fws.gov
		Supervisor – UMR	
U.S. Fish and Wildlife		national Wildlife and	
Service	Ms. Sabrina Chandler	Fish Refuge	
U.S. Fish and Wildlife			James_Myster@fws.gov
Service	Mr. James Myster	Archaeologist	
Advisory Council on			cdaniel@achp.gov
Historic Preservation	Mr. Chris Daniel	Program Analyst	
Absentee-Shawnee Tribe of	Ms. Devon Frazier	Tribal Historic	dfrazier@astribe.com
Indians in Oklahoma	Smith	Preservation Officer	
Absentee-Shawnee Tribe of		Cultural Preservation	cbutler@astribe.com
Indians in Oklahoma	Ms. Carol Butler	Director	
Bad River Band of Lake		Tribal Historic	thpo@badriver-nsn.gov
Superior Chippewa	Mr. Larry Plucinski	Preservation Officer	
Bois Forte Band of	N. T. 1. C.	Tribal Historic	jaylen.strong@boisforte-nsn.gov
Chippewa	Mr. Jaylen Strong	Preservation Officer	
G 11 N .: COLL 1	Mr. Jonathan M.	Tribal Historic	jrohrer@mycaddonation.com
Caddo Nation of Oklahoma	Rohrer	Preservation Officer	1 0 1 1
		Assistant Tribal	cpnthpo@potawatomi.org
Citizen Potawatomi Nation,	Ma Vall: Mastallan	Historic Preservation	
Oklahoma	Ms. Kelli Mosteller	Officer Historia Progonzation	aspeak@dalayyamanatian
Dolovyono Notion Oblaham	Ma Comana Sarata	Historic Preservation	cspeck@delawarenation-nsn.gov
Delaware Nation, Oklahoma	Ms. Carissa Speck	Director Tribal Historic	The and ty @delegy young trill-
Delaware Tribe of Indians	Ms. Susan Bachor	Preservation Officer	lheady@delawaretribe.org
Eastern Shawnee Tribe of	ivis. Susaii Daciioi	Tribal Historic	pbarton@estoo.net
Oklahoma	Mr. Paul Barton	Preservation Officer	poarton@estoo.net
Flandreau-Santee Sioux	Mr. Garrie Kills-A-	Tribal Historic	garrie.killsahundred@fsst.org
Tribe	Hundred	Preservation Officer	garric.kirisanundicu@isst.org
Fond du Lac Band of Lake	Transition	Tribal Historic	EvanSchroeder@FDLREZ.com
Superior Chippewa	Mr. Evan Schroeder	Preservation Officer	Lvansemocacian DEREZ.com
Fort Belknap Indian	Emma "Emmy"	Tribal Historic	emma.filesteel@ftbelknap.org
Community	Filesteel	Preservation Officer	cimia.inosteoragitoeikiap.org
Community	1 11031001	1 10301 valion Officel	<u> </u>

Tribe	Name	Title	Email
Forest County Potawatomi	1,4411	Tribal Historic	Benjamin.Rhodd@fcp-nsn.gov
Community	Mr. Ben Rhodd	Preservation Officer	
		Assistant Tribal	Nicole.Reske@fcpotawatomi-nsn.gov
Forest County Potawatomi		Historic Preservation	Tricerous Grope in mean in inge
Community	Ms. Nicole Reske	Officer	
Grand Portage Band of Lake	TVID: TVICOTO TECSNO	Tribal Historic	thpo@grandportage.com
Superior Chippewa	Mr. Rob Hull	Preservation Officer	in the Samuel arms are an
Hannahville Indian	1/11/11/05 11/4/1	Tribal Historic	EarlMeshigaud@hannahville.org
Community	Mr. Earl Meshigaud	Preservation Officer	Zarmyresingaa'a@namanymeterg
Ho-Chunk Nation of	Mr. William	Tribal Historic	bill.quackenbush@ho-chunk.com
Wisconsin	Quackenbush	Preservation Officer	om.quaekenoush@no enum.eom
Iowa Tribe of Kansas and	Quaerenousn	Tribal Historic	lfoster@iowas.org
Nebraska	Mr. Lance Foster	Preservation Officer	1105101(0)10 Wub.01g
Iowa Tribe of Kansas and	Ivii. Lance i Ostei	Deputy Tribal Historic	akelly@iowas.org
Nebraska	Mr. Alan Kelley	Preservation Officer	anony w 10 w 45.01g
			cpershall@iowanation.org
Iowa Tribe of Oklahoma	Ms. Candace Pershall	Cultural Preservation	
Keweenaw Bay Indian	Mr. Gary Loonsfoot,	Tribal Historic	gloonsfoot@kbic-nsn.gov
Community	Jr.	Preservation Officer	1.01
Kickapoo Traditional Tribe		TTT	hector.gonzalez@kttttribe.org
of Texas	Mr. Hector Gonzalez	Historic Preservation	
Kickapoo Tribe of	Mr. Darwin		darwin.kaskaske@okkt.net
Oklahoma	Kaskaske	Chairman	
Kickapoo Tribe of Indians of			
the Kickapoo Reservation in			
Kansas	Mr. Lester Randall	Chairman	
Lac Courte Oreilles Band of		Tribal Historic	brian.bisonette@lco-nsn.gov
Lake Superior Chippewa	Mr. Brian Bisonette	Preservation Officer	
Lac du Flambeau Band of		Tribal Historic	Sarah.Thompson@ldftribe.com
Lake Superior Chippewa	Ms. Sarah Thompson	Preservation Officer	
Lac Vieux Desert Band of		Tribal Historic	alina.shively@lvd-nsn.gov
Lake Superior Chippewa	Ms. Alina Shively	Preservation Officer	
Little Traverse Bay Bands of		Tribal Historic	MWiatrolik@LTBBODAWA-
Odawa Indians	Wiatrolik	Preservation Officer	NSN.GOV
		Tribal Historic	ginalemon@llojibwe.net
Leech Lake Band of Ojibwe	Ms. Gina Lemon	Preservation Officer	
Lower Sioux Indian	Ms. Cheyanne St.	Tribal Historic	lowersiouxthpo@lowersioux.com
Community	John	Preservation Officer	
Match-E-Be-Nash-She-Wish		Tribal Historic	lakota.hobia@glt-nsn.gov
Band of Pottawatomi Indians	Ms. Lakota Hobia	Preservation Officer	
Match-E-Be-Nash-She-Wish		THPO Assistant	kaila.akina@glt-nsn.gov
Band of Pottawatomi Indians	Ms. Kaila Akina	Director	
Menominee Indian Tribe of		Tribal Historic	dgrignon@mitw.org
Wisconsin	Mr. David Grignon	Preservation Officer	
	5	Tribal Historic	Mike.Wilson@millelacsband.com
Mille Lacs Band of Ojibwe	Mr. Mike Wilson	Preservation Officer	
J		Tribal Historic	lyork@miamination.com
Miami Tribe of Oklahoma	Mr. Logan York	Preservation Officer	, , , , , , , , , , , , , , , , , , , ,

Attachment D: Continued	».T	TD' (I	Email
Tribe	Name	Title	
Nottawaseppi Huron Band	Mr. Douglas R.	Tribal Historic	douglas.taylor@nhbp-nsn.gov
of Potawatomi, Michigan	Taylor	Preservation Officer	
		Tribal Historic	dwight.howe@theomahatribe.com
Omaha Tribe of Nebraska	Mr. Dwight Howe	Preservation Officer	
Otoe-Missouria Tribe of		Tribal Historic	ewhitehorn@omtribe.org
Indians, Oklahoma	Ms. Elsie Whitehorn	Preservation Officer	
Peoria Tribe of Indians of	Ms. Burgundy	Tribal Historic	bfletcher@peoriatribe.com
Oklahoma	Fletcher	Preservation Specialist	
Pokagon Band of			matthew.bussler@pokagonband-
Potawatomi Indians,		Tribal Historic	nsn.gov
Michigan and Indiana	Mr. Matthew Bussler	Preservation Officer	
Prairie Band of Potawatomi		Deputy Tribal Historic	taramitchell@pbpnation.org
Nation	Ms. Tara Mitchell	Preservation Officer	
Prairie Island Indian		Tribal Historic	Noah.White@piic.org
Community	Mr. Noah White	Preservation Officer	Troum winte copierois
	TVIII TOOMT VVIIICE	Tribal Historic	Billie.Burtrum@quapawnation.com
Quapaw Nation	Mr. Billie Burtrum	Preservation Office	Billic.bartrame quapawnation.com
Red Cliff Band of Lake	Wir. Dillic Durtrum	Tribal Historic	marvin.defoe@redcliff-nsn.gov
Superior Chippewa	Mr. Marvin Defoe	Preservation Officer	marvin.deroe@redemi-nsn.gov
Sac and Fox Nation of	IVII. IVIAI VIII DEIGE	Freservation Officer	lies mantaamany@saafayanyina ana
Missouri in Kansas and	Ms. Lisa	Director Environmental	lisa.montgomery@sacfoxenviro.org
Nebraska	Montgomery	Protection Agency	1 1 10 10
Sac and Fox Nation,	M Cl ' D 1	NAGPRA/Historic	chris.boyd@sacandfox-nsn.gov
Oklahoma	Mr. Chris Boyd	Preservation	1 1
Sac and Fox Tribe of the	N. T. 1 1	TT:	director.historic@meskwaki-nsn.gov
Mississippi in Iowa	Mr. Johnathan	Historic Preservation	
(Meskwaki Nation)	Buffalo	Director	
Santee Sioux Nation / Santee		Tribal Historic	ssn.thpo@gmail.com
Sioux Tribe of Nebraska	Mr. Butch Denny	Preservation Officer	
Shakopee Mdewakanton	Mr. Leonard	Cultural Resource	leonard.wabasha@shakopeedakota.org
Sioux Community	Wabasha	Director	
		Historic Preservation	section106@shawnee-tribe.com
Shawnee Tribe	Ms. Tonya Tipton	Office	
	Ms. Dianne	Tribal Historic	DianneD@swo-nsn.gov
Sisseton-Wahpeton Oyate	Desrosiers	Preservation Officer	
Sokaogon Chippewa			Michael.LaRonge@scc-nsn.gov
Community - Mole Lake			
Band of Lake Superior	Mr. Michael	Tribal Historic	
Chippewa	LaRonge	Preservation Officer	
•	Mr. Kenneth	Tribal Historic	thpo@spiritlakenation.com
Spirit Lake Tribe	Graywater, Jr.	Preservation Officer	
St. Croix Band of Chippewa	Ms. Wanda	Tribal Historic	thpo@stcroixtribalcenter.com
Indians	McFaggen	Preservation Officer	
	50	Tribal Historic	ahunter@osagenation-nsn.gov
The Osage Nation	Dr. Andrea Hunter	Preservation Officer	l l l l l l l l l l l l l l l l l l l
			caitlin.nichols@osagenation-nsn.gov
The Osage Nation	Ms. Caitlin Nichols	Archaeologist	<u> </u>
The Osage Nation	Ms. Sarah O'Donnell	Preservation Office	sodonnell@osagenation-nsn.gov

Attachment D: Continued			
Tribe	Name	Title	Email
United Keetoowah Band of		Tribal Historic	awatt@uk-nsn.gov
Cherokee of Oklahoma	Mr. Acee Watt	Preservation Officer	
	Ms. Samantha	Tribal Historic	THPO@uppersiouxcommunity-
Upper Sioux Community	Odegard	Preservation Officer	nsn.gov
		Tribal Historic	Jaime.Arsenault@whiteearth-nsn.gov
White Earth Band of Ojibwe	Ms. Jaime Arsenault	Preservation Officer	
Winnebago Tribe of	Ms. Sunshine	Cultural Preservation	sunshine.bear@winnebagotribe.com
Nebraska	Thomas-Bear	Director	

Appendix K - Coordination by Correspondence	



DEPARTMENT OF THE ARMY

U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT 1222 SPRUCE STREET ST. LOUIS, MISSOURI 63103

June 21, 2024

Engineering and Construction
Curation and Archives Analysis Branch (ECZ)

Subject: Horse Island Ecosystem Restoration Project, near Kaskaskia, Randolph County, Illinois

The Honorable Governor John Raymond Johnson c/o Representative Alicia Miller Absentee-Shawnee Tribe of Indians of Oklahoma 2025 S. Gordon Cooper Drive Shawnee, OK 74801

Dear Governor Johnson,

The U.S. Army Corps of Engineers, St. Louis District (District), is conducting a feasibility study to formulate alternatives to conduct floodplain restoration on Horse Island, near Kaskaskia, Randolph County, Illinois (Figure 1). The Horse Island Ecosystem Restoration Project has been initiated under the Navigation and Ecosystem Sustainability Program (NESP) which is authorized to ensure an efficient and environmentally sustainable navigation system on the Mississippi River. The District is contacting your Tribe to initiate consultation for this action under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations 36 CFR 800.

The study area is located within the Middle Mississippi River National Wildlife Refuge, which is owned by U.S. Fish and Wildlife Service and some private landowners. The primary habitat problem in the study area is a decline in regeneration of desired forest species, an undesirable forest structure, and undesirable tree species composition due to changes in land use, the presence of invasive species, altered hydrology of the river, physical modifications, and increased flooding. The objectives of the project are to restore floodplain forest communities, restore and enhance natural hydrologic conditions and function to the floodplain, and restore and enhance the quality and diversity of wetland habitat. The District is reviewing alternatives, but the Tentatively Selected Plan (TSP) includes tree planting, forest stand improvements (i.e., removal and pruning of trees), drainage improvements, and creation of ridges and swales (Figure 2).

The District has reviewed historic maps and found that the project area was part of the Mississippi River channel until the end of the 19th/beginning of the 20th century (Figures 3-5). Islands began forming in the mid- to late-19th century and it wasn't until 1908 that a significant portion of the study area became land. The 1919 Randolph County Atlas indicates that the study area had been subdivided and sold to multiple landowners, but no buildings were located within the study area.

Due to the study area being a channel of the Mississippi River until the 20th century and no evidence of human habitation in the 20th century, the District has determined that this project will have no adverse effect on historic properties.

If you have any questions, comments, or areas of tribal concern, please contact me at (314) 331-8855 or contact Meredith Hawkins Trautt (Archaeologist and Tribal Liaison) at (314) 925-5031 or email Meredith.M.Trautt@usace.army.mil. A copy of this is letter has been furnished to Ms. Carol Butler and Ms. Devon Frazier Smith.

Sincerely,

Jennifer L. Riordan

Chief, Curation and Archives

Analysis Branch

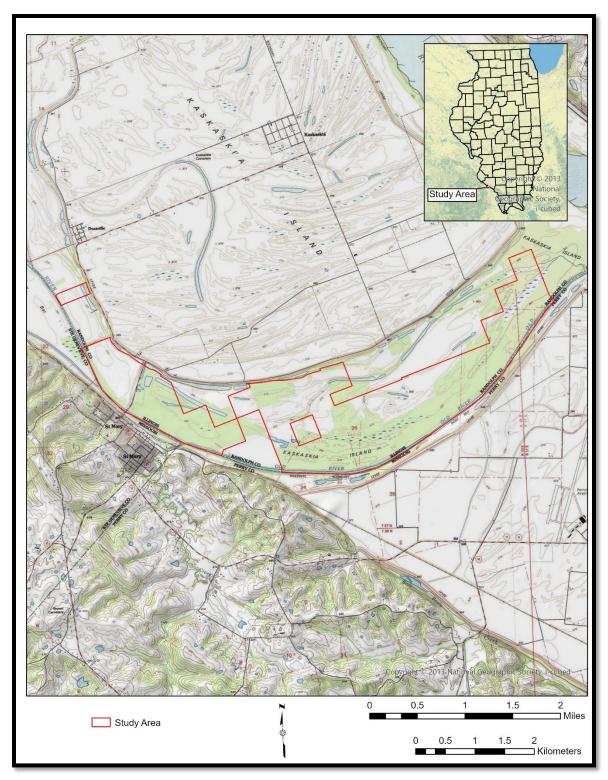


Figure 1. Location map of study area.

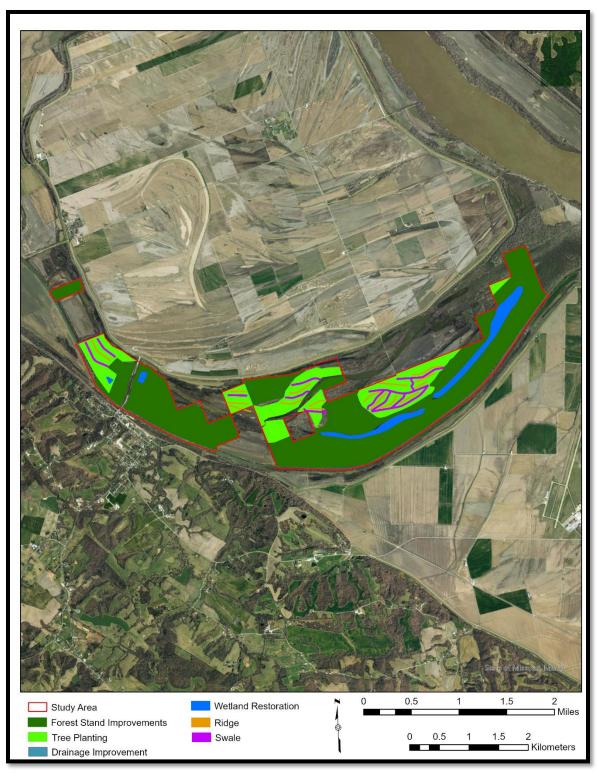


Figure 2. Sketch map of TSP.

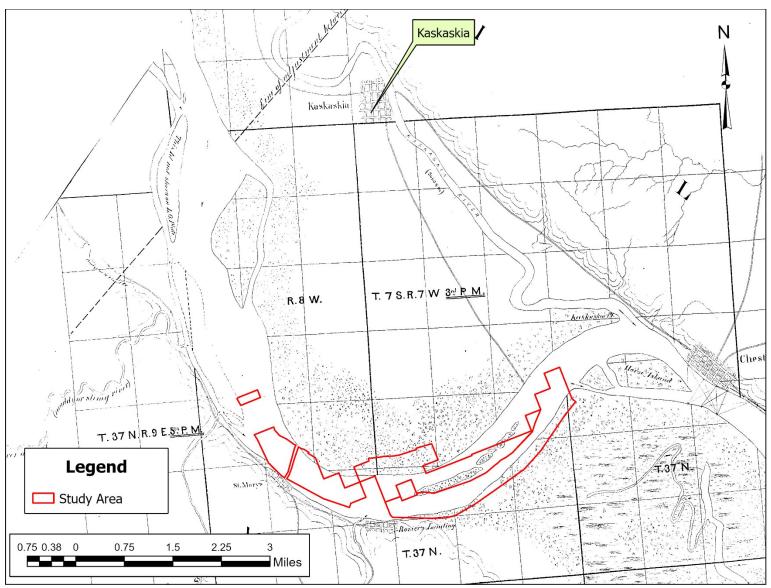


Figure 3. 1866 map of study area.

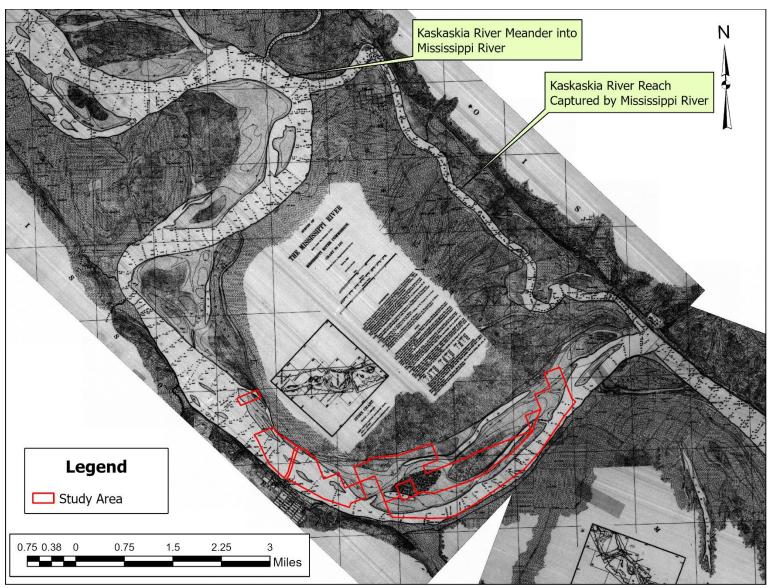


Figure 4. 1880 map of study area.

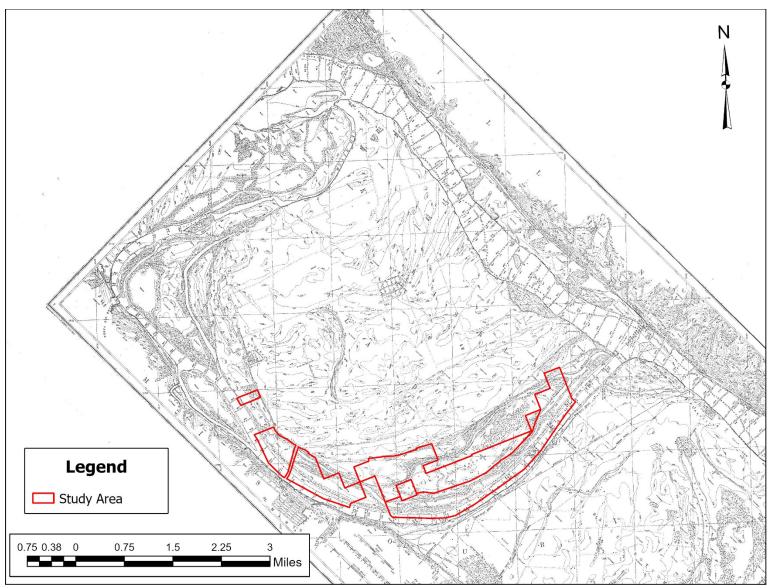


Figure 5. 1908 map of study area.

MVS Leaders

Tribe	Name	Street Address	City	State	Zip	Furnished Copy
Absentee-Shawnee Tribe of Indians of Oklahoma	Governor John Raymond Johnson c/o Representative Alicia Miller	2025 S. Gordon Cooper Drive	Shawnee	OK	74801	Ms. Carol Butler and Ms. Devon Frazier Smith
Caddo Nation of Oklahoma	Chairman Bobby Gonzalez	P.O. Box 487	Binger	ОК	73009	Mr. Jonathan M. Rohrer
Citizen Potawatomi Nation, Oklahoma	Chairman John Barrett	1601 S. Gordon Cooper Drive	Shawnee	ОК	74801	Ms. Tracy Wind
Delaware Nation, Oklahoma	President Deborah Dotson	P.O. Box 825	Anadarko	ОК	73005	Ms. Carissa Speck
Delaware Tribe of Indians	Chief Brad KillsCrow	5100 Tuxedo Boulevard	Bartlesville	OK	74006	Ms. Susan Bachor
Eastern Shawnee Tribe of Oklahoma	Chief Glenna J. Wallace	12755 S. 705 Road	Wyandotte	ОК	74370	Ms. Lora Nuckolls
Forest County Potawatomi Community, Wisconsin	Chairman James A. Crawford	P.O. Box 340, 5416 Everybody's Road	Crandon	WI	54520	Ms. Olivia Nunway
Hannahville Indian Community, Michigan	Chairman Kenneth Meshigaud	N 14911 Hannahville B-1 Road	Wilson	MI	49896	Ms. Molly Meshigaud
Ho-Chunk Nation of Wisconsin	President Jon Greendeer	P.O. Box 667	Black River Falls	WI	54615	Mr. William Quackenbush
Iowa Tribe of Kansas and Nebraska	Chairman Tim Rhodd	3345 Thrasher Road, #8	White Cloud	KS	66094	Mr. Lance Foster and Mr. Alan Kelley
Iowa Tribe of Oklahoma	Chairman Jake Keyes	335588 E. 750 Rd	Perkins	ОК	74059	Ms. Candace Pershall

Kickapoo Tribe of Indians of the	Chairwoman Gail Cheatham	824 111th Drive	Horton	KS	66439	Mr. Howard Allen
Kickapoo Reservation in Kansas						
Kickapoo Tribe of Oklahoma	Chairman Darwin Kaskaske	P.O. Box 70	McCloud	ОК	24851	Tribal Historic Preservation Office
Miami Tribe of Oklahoma	Chief Douglas Lankford	P.O. Box 1326	Miami	ОК	74355	Mr. Logan York
Nottawaseppi Huron Band of the Potawatomi, Michigan	Chairman Jamie Stuck	2221—1 & 1/2 Mile Road	Fulton	MI	49052	Ms. Onyleen Zapata
Peoria Tribe of Indians of Oklahoma	Chief Craig Harper	P.O. Box 1527	Miami	ОК	74355	Ms. Burgundy Fletcher
Prairie Band Potawatomi Nation	Chairman Joseph Rupnick	Government Center, 16281 Q Road	Mayetta	KS	66509	Ms. Tara Mitchell
Sac & Fox Nation of Missouri in Kansas and Nebraska	Chairperson Tiauna Carnes	305 N. Main Street	Reserve	KS	66434	Mr. Gary Bahr
Sac & Fox Nation, Oklahoma	Prinicpal Chief Randle Carter	920963 S Highway 99	Stroud	ОК	74079	Mr. Chris Boyd
Sac & Fox Tribe of the Mississippi in Iowa	Chairman Vern Jefferson	349 Meskwaki Road	Tama	IA	52339	Mr. Johnathan Buffalo
Shawnee Tribe	Chief Benjamin Barnes	29 S Hwy 69A	Miami	ОК	74354	Ms. Tonya Tipton
United Keetoowah Band of Cherokee of Oklahoma	Chief Joe Bunch	P.O. Box 746	Tahlequah	ОК	74464	Mr. Acee Watt

MVS Reps – Hard Copy

Tribe	Name	Position	Street Address	City	State	Zip	
Absentee-Shawnee Tribe of Indians of Oklahoma	Ms. Carol Butler	Cultural Preservation Director	2025 S. Gordon Cooper Drive	Shawnee	OK	74801	
Caddo Nation of Oklahoma	Mr. Jonathan M. Rohrer	Tribal Historic Preservation Officer	P.O. Box 487	Binger	ОК	73009	
Hannahville Indian Community, Michigan	Ms. Molly Meshigaud	Tribal Historic Preservation Officer	N14911 Hannahville B-1 Rd	Wilson	MI	49896	
Iowa Tribe of Kansas and Nebraska	Mr. Lance Foster	Tribal Historic Preservation Officer	3345B Thrasher Road	White Cloud	KS	66094	
Iowa Tribe of Oklahoma	Ms. Candace Pershall	Cultural Preservation	335588 E. 750 Rd	Perkins	ОК	74875	
Kickapoo Tribe of Oklahoma	Tribal Historic Preservation Office		P.O. Box 70	McCloud	ОК	24851	
Pokagon Band of Potawatomi Indians, Michigan and Indiana	Mr. Matthew Bussler	Tribal Historic Preservation Officer	P.O. Box 180	Dowagiac	MI	49047	
Prairie Band Potawatomi Nation	Ms. Tara Mitchell	Deputy Tribal Historic Preservation Officer	Government Center, 16281 Q Road	Mayetta	KS	66509	
Sac & Fox Nation, Oklahoma	Mr. Chris Boyd	NAGPRA/Historic Preservation Office	920963 S Highway 99	Stroud	OK	74079	
Sac & Fox Tribe of the Mississippi in Iowa	Mr. Johnathan Buffalo	Historic Preservation Office	349 Meskwaki Road	Tama	IA	52339	

MVS Reps – Email

Tribe	Name	Position	Street Address	City	State	Zip	Email
Absentee-Shawnee Tribe of Indians of Oklahoma	Ms. Devon Frazier Smith	Tribal Historic Preservation Officer	2025 S. Gordon Cooper Drive	Shawnee	OK	74801	dfrazier@astribe.com
Citizen Potawatomi Nation, Oklahoma	Ms. Tracy Wind	Assistant Tribal Historic Preservation Officer	Cultural Heritage Center, 1601 S. Gordon Cooper Dr	Shawnee	ОК	74801	cpnthpo@potawatomi.org
Delaware Nation, Oklahoma	Ms. Carissa Speck	Historic Preservation Director	31064 SH 281, P.O. Box 825	Anardako	ОК	73005	cspeck@delawarenation- nsn.gov
Delaware Tribe of Indians	Ms. Susan Bachor	Historic Preservation Officer	5100 Tuxedo Blvd.	Bartlesville	ОК	74006	sbachor@delawaretribe.org
Eastern Shawnee Tribe of Oklahoma	Ms. Lora Nuckolls	Tribal Historic Preservation Officer	70500 E. 128 Road	Wyandotte	OK	74370	THPO@estoo.net
Forest County Potawatomi Community, Wisconsin	Ms. Olivia Nunway	Assistant Tribal Historic Preservation Officer	8130 Mish ko Swen Dr., P.O. Box 340	Crandon	WI	54520	Olivia.Nunway@fcp-nsn.gov
Ho-Chunk Nation of Wisconsin	Mr. William Quackenbush	Tribal Historic Preservation Officer	P.O. Box 667	Black River Falls	WI	54615	bill.quackenbush@ho- chunk.com

Iowa Tribe of Kansas and Nebraska	Mr. Alan Kelley	Deputy Tribal Historic Preservation Officer	3345 Thrasher Road	White Cloud	KS	66094	akelley@iowas.org
Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	Mr. Howard Allen	Secretary	824 111th Drive	Horton	KS	66439	secretary@ktik-nsn.gov
Miami Tribe of Oklahoma	Mr. Logan York	Tribal Historic Preservation Officer	202 S. Eight Tribes Trail, P.O. Box 1326	Miami	OK	74355	THPO@MiamiNation.com
Nottawaseppi Huron Band of the Potawatomi, Michigan	Ms. Onyleen Zapata	Tribal Historic Preservation Officer	1485 MNO Bmadzen Way	Fulton	МІ	49052	Onyleen.Zapata@nhbp-nsn.gov
The Osage Nation	Dr. Andrea Hunter	Historic Preservation Office	627 Grandview Avenue	Pawhuska	OK	74056	s106@osagenation-nsn.gov
Peoria Tribe of Indians of Oklahoma	Ms. Burgundy Fletcher	Tribal Historic Preservation Specialist	118 S. Eight Tribes Trail	Miami	OK	74354	bfletcher@peoriatribe.com
Quapaw Nation	Ms. Billie Burtrum	Preservation Officer/QHPP Director	ATTN: QNHPP, P.O. Box 765	Quapaw	ОК	74363	section106@quapawnation.com
Sac & Fox Nation of Missouri in Kansas and Nebraska	Mr. Gary Bahr	Vice Chairperson	305 N. Main Street	Reserve	KS	66434	gary.bahr@sacfoxks.com

Shawnee Tribe	Ms. Tonya Tipton	Historic	P.O. Box 189	Miami	ОК	74355	Section106@shawnee-tribe.com
		Preservation Office					
United Keetoowah Band of Cherokee of Oklahoma	Mr. Acee Watt	Tribal Historic Preservation Officer	P.O. Box 746	Tahlequah	OK	74464	ukbthpo@ukb-nsn.gov



DEPARTMENT OF THE ARMY

U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT 1222 SPRUCE STREET ST. LOUIS, MISSOURI 63103

June 21, 2024

Engineering and Construction Curation and Archives Analysis Branch (ECZ)

Subject: Horse Island Ecosystem Restoration Project, near Kaskaskia, Randolph County, Illinois

Jeffrey D. Kruchten Illinois State Historic Preservation Office Illinois Department of Natural Resources One Natural Resources Way Springfield, Illinois 62702

Dear Mr. Kruchten,

The U.S. Army Corps of Engineers, St. Louis District (District), is conducting a feasibility study to formulate alternatives to conduct floodplain restoration on Horse Island, near Kaskaskia, Randolph County, Illinois (Figure 1). The Horse Island Ecosystem Restoration Project has been initiated under the Navigation and Ecosystem Sustainability Program (NESP) which is authorized to ensure an efficient and environmentally sustainable navigation system on the Mississippi River. The District is contacting your office to initiate consultation for this action under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations 36 CFR 800.

The study area is located within the Middle Mississippi River National Wildlife Refuge, which is owned by U.S. Fish and Wildlife Service and some private landowners. The primary habitat problem in the study area is a decline in regeneration of desired forest species, an undesirable forest structure, and undesirable tree species composition due to changes in land use, the presence of invasive species, altered hydrology of the river, physical modifications, and increased flooding. The objectives of the project are to restore floodplain forest communities, restore and enhance natural hydrologic conditions and function to the floodplain, and restore and enhance the quality and diversity of wetland habitat. The District is reviewing alternatives, but the Tentatively Selected Plan (TSP) includes tree planting, forest stand improvements (i.e., removal and pruning of trees), drainage improvements, and creation of ridges and swales (Figure 2).

The District has reviewed historic maps and found that the project area was part of the Mississippi River channel until the end of the 19th/beginning of the 20th century (Figures 3-5). Islands began forming in the mid- to late-19th century and it wasn't until 1908 that a significant portion of the study area became land. The 1919 Randolph County Atlas indicates that the study area had been subdivided and sold to multiple landowners, but no buildings were located within the study area.

Due to the study area being a channel of the Mississippi River until the 20th century and no evidence of human habitation in the 20th century, the District has determined that this project will have no adverse effect on historic properties.

If you have any questions or comments, please contact Meredith Hawkins Trautt (Archaeologist) at (314) 925-5031 or email Meredith.M.Trautt@usace.army.mil.

Sincerely,

Jennifer L. Riordan

Chief, Curation and Archives

Analysis Branch

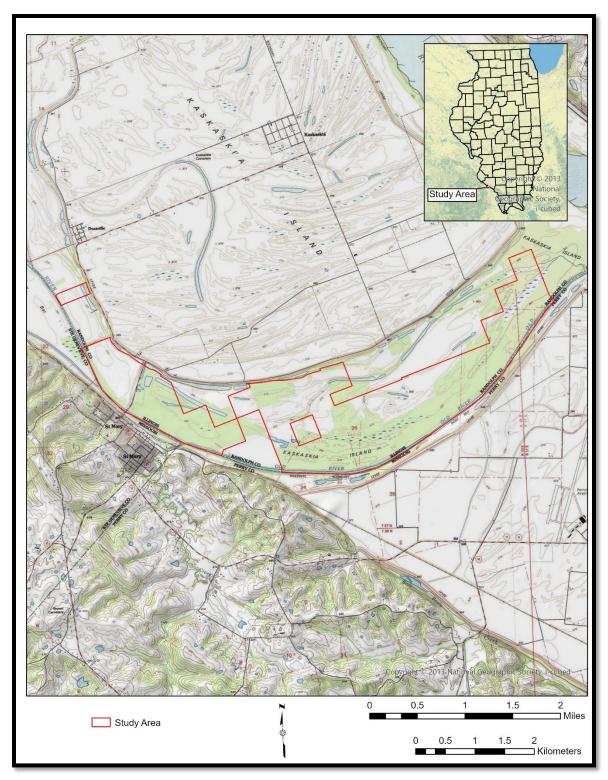


Figure 1. Location map of study area.

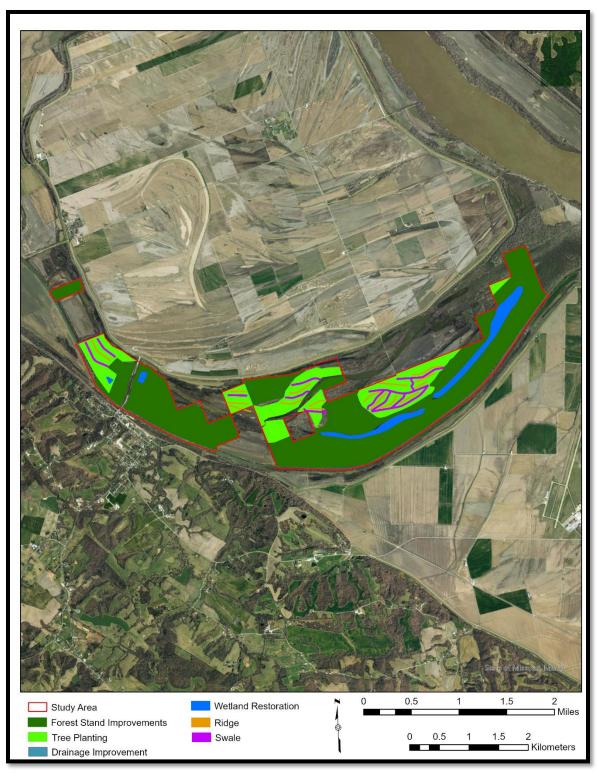


Figure 2. Sketch map of TSP.

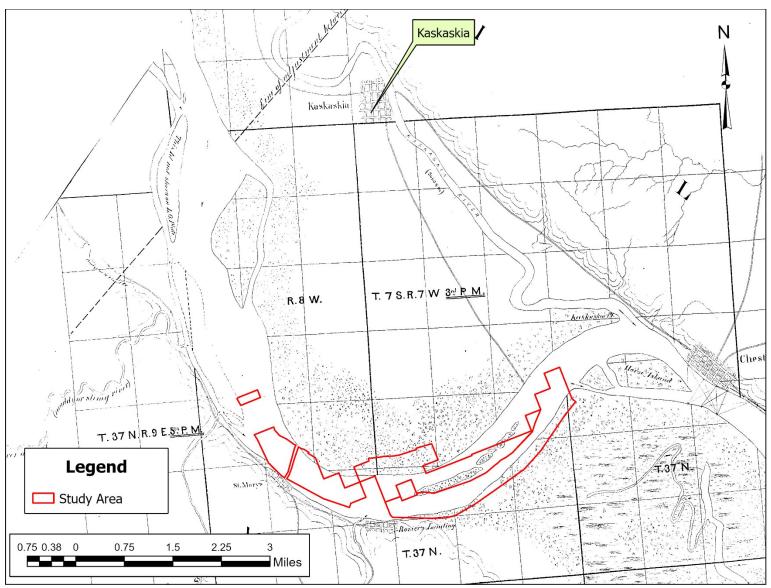


Figure 3. 1866 map of study area.

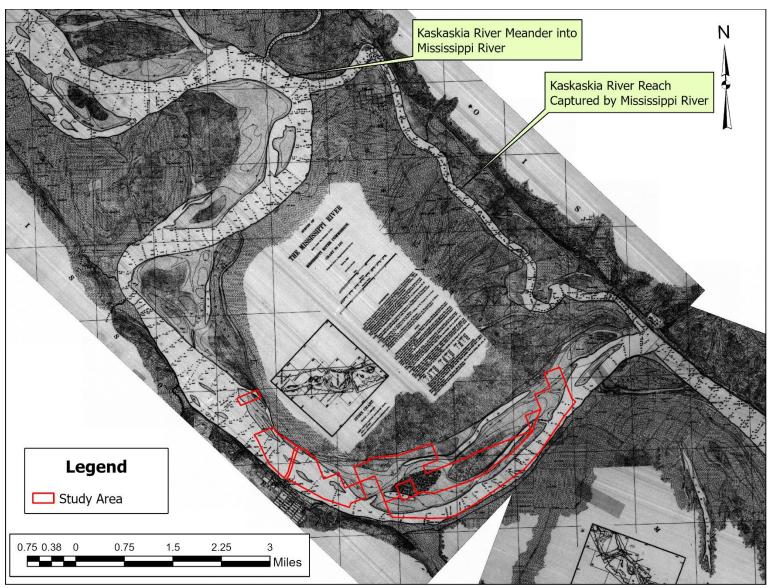


Figure 4. 1880 map of study area.

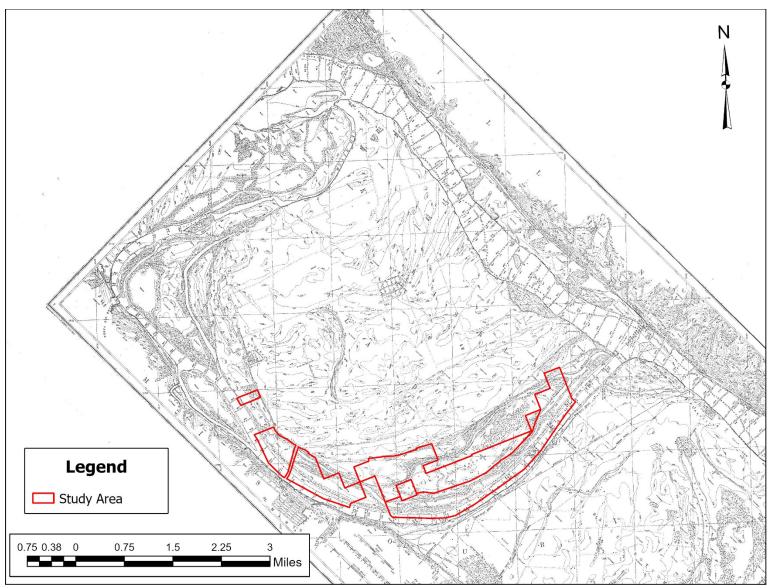


Figure 5. 1908 map of study area.

Via email: Meredith.m.trautt@usace.army.mil

July 10, 2024

Chief Jennifer Riordan
US Army Corps of Engineers, St. Louis District
1222 Spruce Street
St. Louis, MO 63103

RE: Horse Island Ecosystem Restoration Project, Randolph County, Illinois

Dear Chief Riordan:

The Peoria Tribe offers no objection to the above-referenced project at this time. However, given the Peoria Tribe's deep and enduring relationship to its historic lands and cultural property within present-day Illinois, if any human remains or Native American cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) or archaeological evidence is discovered during any phase of this project, the Peoria Tribe requests immediate consultation with the entity of jurisdiction for the location of discovery. In such a case, please contact me at (918) 544-9234 or by email at bletcher@peoriatribe.com to initiate consultation.

The Peoria Tribe accepts this request to serve as a consulting party.

Respectfully,

Burgundy Fletcher

Burgundy Fletcher Historic Preservation Specialist

SHPO LOG #021062124

PLEASE REFER TO:



Randolph County Kaskaskia Middle Mississippi River National Wildlife Refuge COESTL Horse Island Ecosystem Restoration Project

July 19, 2024

Jennifer Riordan U.S. Army Corps of Engineers, St. Louis District 1222 Spruce Street St. Louis, MO 63103

We have reviewed the documentation submitted for the referenced project in accordance with 36 CFR Part 800.4. Based upon the information provided, no historic properties will be affected. We, therefore, have no objection to the undertaking proceeding as planned.

Please retain this letter in your files as evidence of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. This approval remains in effect for two (2) years from date of issuance. It does not pertain to any discovery during construction, nor is it a clearance for purposes of the Illinois Human Remains Protection Act (20 ILCS 3440).

If you are an applicant, please submit a copy of this letter to the state or federal agency from which you obtain any permit, license, grant, or other assistance. If further assistance is needed contact Jeff Kruchten, Principal Archaeologist, at 217/785-1279 or jeff.kruchten@illinois.gov.

Sincerely,

Carey L. Mayer, AIA Deputy State Historic

arey L. Mayer

Preservation Officer

From: <u>Jonathan Rohrer</u>

To: <u>Trautt, Meredith M CIV USARMY CEMVS (USA)</u>

Subject: [Non-DoD Source] Horse Island Ecosystem Restoration Project -

Date: Tuesday, August 13, 2024 11:26:39 AM

Meredith

Thank you for your request for consultation, received on 06-24-2024. The Caddo Nation appreciates your willingness to conduct proper consultation, pursuant to Section 106 of the National Historic Preservation Act.

Upon review of the project and location I have determined that it does not affect known cultural, traditional or sacred sites of interest to the Caddo Nation. As such, the Caddo Nation has no objection to the project at this time. However, in the event that an inadvertent discovery of potentially relevant cultural sites, funerary objects, or human remains occurs, we request that the project be immediately halted and the proper authorities be contacted. Additionally, The Caddo Nation would need to be notified of an inadvertent discovery with 24 hours.

Should you have any question or concerns regarding this response please feel free to contact our office.

Best regards,

Jonathan

Jonathan M. Rohrer

Tribal Historic Preservation Officer



Caddo Nation

P.O. Box 487 Binger, OK 73009 t: (405)656-0970 Ext. 2070 e: jrohrer@mycaddonation.com

www.mycaddonation.com

NESP Project Implementation Report with Integrated EA Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)

Appendix L – Clean Water Act Compliance

NESP Project Implementation Report with Integrated EA Horse Island Ecosystem Restoration Project Horse Island (Randolph County, Illinois)

To be authorized by the Nationwide Permit (NWP) 27, the aquatic habitat restoration, enhancement, or establishment activity must be planned, designed, and implemented so that it results in aquatic habitat that resembles an ecological reference. An ecological reference may be based on the characteristics of an intact aquatic habitat or riparian area of the same type that exists in the region. An ecological reference may be based on a conceptual model developed from regional ecological knowledge of the target aquatic habitat type or riparian area.

The analysis contained in the main report and in this Appendix and the Habitat Evaluation Appendix documents compliance with the above requirement and all associated NWP conditions. The yellow warbler HSI model evaluation shows an increase in HSI values between the no action alternative and the tentatively selected plan (TSP) alternative. The Habitat Evaluation demonstrates that the TSP provides a net increase average annualized habitat units (AAHUs). Specifically the NWP 27 authorizes "activities need to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species". The TSP does not propose to covert one aquatic habitat to a different habitat type. The proposed work will comply with all of the General Conditions of the NWP 27.

NATIONWIDE PERMIT 27

Aquatic Habitat Restoration, Enhancement, and Establishment Activities

Effective Date: March 19, 2017 (NWP Final Notice, 82 FR 4)

27. <u>Aquatic Habitat Restoration</u>, <u>Enhancement</u>, <u>and Establishment Activities</u>. Activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, and the rehabilitation or enhancement of tidal streams, tidal wetlands, and tidal open waters, provided those activities result in net increases in aquatic resource functions and services.

To be authorized by this NWP, the aquatic habitat restoration, enhancement, or establishment activity must be planned, designed, and implemented so that it results in aquatic habitat that resembles an ecological reference. An ecological reference may be based on the characteristics of an intact aquatic habitat or riparian area of the same type that exists in the region. An ecological reference may be based on a conceptual model developed from regional ecological knowledge of the target aquatic habitat type or riparian area.

To the extent that a Corps permit is required, activities authorized by this NWP include, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms, as well as discharges of dredged or fill material to restore appropriate stream channel configurations after small water control structures, dikes, and berms, are removed; the installation of current deflectors; the enhancement, rehabilitation, or re-establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to enhance, rehabilitate, or reestablish stream meanders; the removal of stream barriers, such as undersized culverts, fords, and grade control structures; the backfilling of artificial channels; the removal of existing drainage structures, such as drain tiles, and the filling, blocking, or reshaping of drainage ditches to restore wetland hydrology; the installation of structures or fills necessary to restore or enhance wetland or stream hydrology; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; re-establishment of submerged aquatic vegetation in areas where those plant communities previously existed; re-establishment of tidal wetlands in tidal waters where those wetlands previously existed; mechanized land clearing to remove nonnative invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species should be planted at the site.

This NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site provided there are net increases in aquatic resource functions and services.

Except for the relocation of non-tidal waters on the project site, this NWP does not authorize the conversion of a stream or natural wetlands to another aquatic habitat type (e.g., the conversion of a stream to wetland or vice versa) or uplands. Changes in wetland plant communities that occur when wetland hydrology is more fully restored during wetland rehabilitation activities are not considered a conversion to another aquatic habitat type. This NWP does not authorize stream channelization. This NWP does not authorize the relocation of tidal waters or the

conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Compensatory mitigation is not required for activities authorized by this NWP since these activities must result in net increases in aquatic resource functions and services.

Reversion. For enhancement, restoration, and establishment activities conducted: (1) In accordance with the terms and conditions of a binding stream or wetland enhancement or restoration agreement, or a wetland establishment agreement, between the landowner and the U.S. Fish and Wildlife Service (FWS), the Natural Resources Conservation Service (NRCS), the Farm Service Agency (FSA), the National Marine Fisheries Service (NMFS), the National Ocean Service (NOS), U.S. Forest Service (USFS), or their designated state cooperating agencies; (2) as voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or (3) on reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) or the applicable state agency, this NWP also authorizes any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or establishment activities). The reversion must occur within five years after expiration of a limited term wetland restoration or establishment agreement or permit, and is authorized in these circumstances even if the discharge occurs after this NWP expires. The fiveyear reversion limit does not apply to agreements without time limits reached between the landowner and the FWS, NRCS, FSA, NMFS, NOS, USFS, or an appropriate state cooperating agency. This NWP also authorizes discharges of dredged or fill material in waters of the United States for the reversion of wetlands that were restored, enhanced, or established on prior-converted cropland or on uplands, in accordance with a binding agreement between the landowner and NRCS, FSA, FWS, or their designated state cooperating agencies (even though the restoration, enhancement, or establishment activity did not require a section 404 permit). The prior condition will be documented in the original agreement or permit, and the determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before conducting any reversion activity the permittee or the appropriate Federal or state agency must notify the district engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements are applicable to that type of land at the time. The requirement that the activity results in a net increase in aquatic resource functions and services does not apply to reversion activities meeting the above conditions. Except for the activities described above, this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion.

Reporting. For those activities that do not require pre-construction notification, the permittee must submit to the district engineer a copy of: (1) The binding stream enhancement or restoration agreement or wetland enhancement, restoration, or establishment agreement, or a project description, including project plans and location map; (2) the NRCS or USDA Technical Service Provider documentation for the voluntary stream enhancement or restoration action or wetland restoration, enhancement, or establishment action; or (3) the SMCRA permit issued by OSMRE or the applicable state agency. The report must also include information on baseline ecological conditions on the project site, such as a delineation of wetlands, streams, and/or other aquatic habitats. These documents must be submitted to the district engineer at least 30 days prior to commencing activities in waters of the United States authorized by this NWP.

<u>Notification</u>: The permittee must submit a pre-construction notification to the district engineer prior to commencing any activity (see general condition 32), except for the following activities:

- (1) Activities conducted on non-Federal public lands and private lands, in accordance with the terms and conditions of a binding stream enhancement or restoration agreement or wetland enhancement, restoration, or establishment agreement between the landowner and the FWS, NRCS, FSA, NMFS, NOS, USFS or their designated state cooperating agencies;
- (2) Voluntary stream or wetland restoration or enhancement action, or wetland establishment action, documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or
- (3) The reclamation of surface coal mine lands, in accordance with an SMCRA permit issued by the OSMRE or the applicable state agency.

However, the permittee must submit a copy of the appropriate documentation to the district engineer to fulfill the reporting requirement. (Authorities: Sections 10 and 404)

Note: This NWP can be used to authorize compensatory mitigation projects, including mitigation banks and in-lieu fee projects. However, this NWP does not authorize the reversion of an area used for a compensatory mitigation project to its prior condition, since compensatory mitigation is generally intended to be permanent.

Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

- 1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.
- (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
- (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

- 2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.
- 3. <u>Spawning Areas</u>. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
- 4. <u>Migratory Bird Breeding Areas</u>. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
- 5. <u>Shellfish Beds</u>. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
- 6. <u>Suitable Material</u>. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).
- 7. <u>Water Supply Intakes</u>. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
- 8. <u>Adverse Effects From Impoundments</u>. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
- 9. <u>Management of Water Flows</u>. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
- 10. <u>Fills Within 100-Year Floodplains</u>. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
- 11. <u>Equipment</u>. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
- 12. <u>Soil Erosion and Sediment Controls</u>. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must

be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

- 13. <u>Removal of Temporary Fills</u>. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
- 14. <u>Proper Maintenance</u>. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
- 15. <u>Single and Complete Project</u>. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.
- 16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.
- (b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.
- (c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.
- 17. <u>Tribal Rights</u>. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.
- 18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.
- (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the

Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

- (c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete preconstruction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have "no effect" on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.
- (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.
- (e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.
- (f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA

section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

- (g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.
- 19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.
- 20. <u>Historic Properties</u>. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.
- (b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.
- (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations

for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

- (d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.
- (e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.
- 21. <u>Discovery of Previously Unknown Remains and Artifacts</u>. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
- 22. <u>Designated Critical Resource Waters</u>. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.
- (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.
- (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district

engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

- 23. <u>Mitigation</u>. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:
- (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).
- (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.
- (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.
- (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).
- (e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.
- (f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

- (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.
- (2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).
- (3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.
- (4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).
- (5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.
- (6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).
- (g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.
- (h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

- (i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.
- 24. <u>Safety of Impoundment Structures</u>. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.
- 25. <u>Water Quality</u>. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.
- 26. <u>Coastal Zone Management</u>. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.
- 27. <u>Regional and Case-By-Case Conditions</u>. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.
- 28. <u>Use of Multiple Nationwide Permits</u>. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
- 29. <u>Transfer of Nationwide Permit Verifications</u>. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)	 	
(Date)		

- 30. <u>Compliance Certification</u>. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:
- (a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(1)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
 - (c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

- 31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.
- 32. <u>Pre-Construction Notification</u>. (a) <u>Timing</u>. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).
- (b) <u>Contents of Pre-Construction Notification</u>: The PCN must be in writing and include the following information:
 - (1) Name, address and telephone numbers of the prospective permittee;
 - (2) Location of the proposed activity;
- (3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;
- (4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

- (5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;
- (6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.
- (7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;
- (8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;
- (9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and
- (10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.
- (c) <u>Form of Pre-Construction Notification</u>: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.
- (d) <u>Agency Coordination</u>: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and

conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

- (2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.
- (3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.
- (4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.
- (5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

D. District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed

activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2-acre.

- 2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.
- 3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed

under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

E. Further Information

- 1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
- 2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
 - 3. NWPs do not grant any property rights or exclusive privileges.
 - 4. NWPs do not authorize any injury to the property or rights of others.
- 5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

F. Definitions

<u>Best management practices (BMPs)</u>: Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

<u>Compensatory mitigation</u>: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

<u>Currently serviceable</u>: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

<u>Discharge</u>: The term "discharge" means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

<u>Ephemeral stream</u>: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

<u>Establishment (creation)</u>: The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

<u>High Tide Line</u>: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

<u>Historic Property</u>: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

<u>Independent utility</u>: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

<u>Indirect effects</u>: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

<u>Intermittent stream</u>: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the acres or linear feet of stream bed that are filled or excavated as a result of the regulated activity. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

<u>Navigable waters</u>: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas.

<u>Perennial stream</u>: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

<u>Practicable</u>: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

<u>Pre-construction notification</u>: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work

and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

<u>Preservation</u>: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

<u>Protected tribal resources</u>: Those natural resources and properties of traditional or customary religious or cultural importance, either on or off Indian lands, retained by, or reserved by or for, Indian tribes through treaties, statutes, judicial decisions, or executive orders, including tribal trust resources.

<u>Re-establishment</u>: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

<u>Rehabilitation</u>: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

<u>Restoration</u>: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

<u>Riparian areas</u>: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

<u>Stream channelization</u>: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

<u>Structure</u>: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

<u>Tidal wetland</u>: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

<u>Tribal lands</u>: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

<u>Tribal rights</u>: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

<u>Vegetated shallows</u>: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

<u>Waterbody</u>: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States. If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

- 1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.
- (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
- (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
- 2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

- 3. <u>Spawning Areas</u>. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
- 4. <u>Migratory Bird Breeding Areas</u>. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
- 5. <u>Shellfish Beds</u>. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
- 6. <u>Suitable Material</u>. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).
- 7. <u>Water Supply Intakes</u>. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
- 8. <u>Adverse Effects From Impoundments</u>. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
- 9. <u>Management of Water Flows</u>. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
- 10. <u>Fills Within 100-Year Floodplains</u>. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
- 11. <u>Equipment</u>. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
- 12. <u>Soil Erosion and Sediment Controls</u>. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.
- 13. <u>Removal of Temporary Fills</u>. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

- 14. <u>Proper Maintenance</u>. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
- 15. <u>Single and Complete Project</u>. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.
- 16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.
- (b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.
- (c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.
- 17. <u>Tribal Rights</u>. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.
- 18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.
- (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

- (c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete preconstruction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have "no effect" on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.
- (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.
- (e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.
- (f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.
- (g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

- 19. <u>Migratory Birds and Bald and Golden Eagles</u>. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.
- 20. <u>Historic Properties</u>. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.
- (b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.
- (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

- (d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.
- (e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.
- 21. <u>Discovery of Previously Unknown Remains and Artifacts</u>. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
- 22. <u>Designated Critical Resource Waters</u>. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.
- (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.
- (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.
- 23. <u>Mitigation</u>. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

- (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).
- (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.
- (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.
- (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).
- (e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.
- (f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.
- (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or inlieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

- (2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).
- (3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.
- (4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).
- (5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.
- (6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).
- (g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.
- (h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.
- (i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

- 24. <u>Safety of Impoundment Structures</u>. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.
- 25. <u>Water Quality</u>. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.
- 26. <u>Coastal Zone Management</u>. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.
- 27. <u>Regional and Case-By-Case Conditions</u>. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.
- 28. <u>Use of Multiple Nationwide Permits</u>. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
- 29. <u>Transfer of Nationwide Permit Verifications</u>. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

ns and condition	s, have the	transferee	sign and da	ate below.
(Transferee)				

(Date)

- 30. <u>Compliance Certification</u>. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:
- (a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
 - (c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

- 31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a preconstruction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.
- 32. Pre-Construction Notification. (a) <u>Timing</u>. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:
- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that

listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

- (b) <u>Contents of Pre-Construction Notification</u>: The PCN must be in writing and include the following information:
 - (1) Name, address and telephone numbers of the prospective permittee;
 - (2) Location of the proposed activity;
- (3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;
- (4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);
- (5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore,

the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

- (6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.
- (7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;
- (8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;
- (9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and
- (10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.
- (c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.
- (d) <u>Agency Coordination</u>: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.
- (2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess

of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

- (3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.
- (4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.
- (5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.D. District Engineer's Decision
- 1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and

ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2-acre.

- 2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.
- 3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.
- 4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the

adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. E. Further Information

- 1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
- 2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
 - 3. NWPs do not grant any property rights or exclusive privileges.
 - 4. NWPs do not authorize any injury to the property or rights of others.
- 5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

F. Definitions

<u>Best management practices (BMPs)</u>: Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

<u>Compensatory mitigation</u>: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

<u>Currently serviceable</u>: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

<u>Direct effects</u>: Effects that are caused by the activity and occur at the same time and place.

<u>Discharge</u>: The term "discharge" means any discharge of dredged or fill material into waters of the United States.

<u>Ecological reference</u>: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An

ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

<u>Ephemeral stream</u>: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

<u>Establishment (creation)</u>: The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

<u>High Tide Line</u>: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

<u>Historic Property</u>: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

<u>Independent utility</u>: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

<u>Indirect effects</u>: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

<u>Intermittent stream</u>: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the acres or linear feet of stream bed that are filled or excavated as a result of the regulated activity. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

<u>Navigable waters</u>: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

<u>Non-tidal wetland</u>: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas.

<u>Perennial stream</u>: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

<u>Practicable</u>: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

<u>Pre-construction notification</u>: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

<u>Preservation</u>: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated

with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

<u>Protected tribal resources</u>: Those natural resources and properties of traditional or customary religious or cultural importance, either on or off Indian lands, retained by, or reserved by or for, Indian tribes through treaties, statutes, judicial decisions, or executive orders, including tribal trust resources.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Reestablishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

<u>Rehabilitation</u>: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

<u>Restoration</u>: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

<u>Riparian areas</u>: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

<u>Shellfish seeding</u>: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP

authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

<u>Stormwater management</u>: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

<u>Stream channelization</u>: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

<u>Tidal wetland</u>: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

<u>Tribal lands</u>: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

<u>Tribal rights</u>: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

<u>Vegetated shallows</u>: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

<u>Waterbody</u>: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States. If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.

ADDITIONAL INFORMATION

This nationwide permit is effective March 19, 2017, and expires on March 18, 2022.

Information about the U.S. Army Corps of Engineers regulatory program, including nationwide permits, may also be found at http://www.usace.army.mil/Missions/Regulatory.aspx and http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx

2017 NATIONWIDE PERMIT (NWP) REGIONAL CONDITIONS FOR THE STATE OF TEXAS

The following regional conditions apply within the entire State of Texas:

- 1. For all discharges proposed for authorization under Nationwide Permits (NWP) 3, 6, 7, 12, 14, 18, 19, 21, 23, 25, 27, 29, 39, 40, 41, 42, 43, 44, 49, 51, and 52, into the following habitat types or specific areas, the applicant shall notify the appropriate District Engineer in accordance with the NWP General Condition 32, Pre-Construction Notification (PCN). The Corps of Engineers (Corps) will coordinate with the resource agencies as specified in NWP General Condition 32(d) (PCN). The habitat types or areas are:
 - a. Pitcher Plant Bogs: Wetlands typically characterized by an organic surface soil layer and include vegetation such as pitcher plants (*Sarracenia* spp.) and/or sundews (*Drosera* spp.).
 - b. Bald Cypress-Tupelo Swamps: Wetlands dominated by bald cypress (*Taxodium distichum*) and/or water tupelo (*Nyssa aquatic*).
- 2. For all activities proposed for authorization under any Nationwide Permit (NWP) at sites approved as compensatory mitigation sites (either permittee-responsible, mitigation bank and/or in-lieu fee) under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899, the applicant shall notify the appropriate District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification prior to commencing the activity.
- 3. For all activities proposed for authorization under NWP 16, the applicant shall notify the appropriate District Engineer in accordance with the NWP General Condition 32 (Pre-Construction Notification) and must obtain an individual water quality certification (WQC) from the TCEQ. Work cannot begin under NWP 16 until the applicant has received written approval from the Corps and WQC.

NOTE: For all activities proposing to use equipment that has operated or been stored in a water body on the Texas list of zebra mussel (*Dreissena polymorpha*) infected water bodies, equipment should be decontaminated prior to relocation in accordance with Texas Administrative Code, Title 31, Part 2, Chapter 57, Subchapter A. The following decontamination Best Management Practices (BMPs), as a minimum, are indicated:

- a. Clean: Clean both the inside and outside of equipment and gear, by removing all plants, animals, and mud and thoroughly washing the equipment using a high pressure spray nozzle.
- b. Drain: Drain all water from receptacles before leaving the area, including livewells, bilges, ballast, and engine cooling water on boats.
- c. Dry: Allow time for your equipment to dry completely before relocating in other waters. Equipment should be dried prior to relocation. High temperature pressure washing (greater than or equal to 140F) or professional cleaning may be substituted for drying time.

The following regional condition only applies within the Albuquerque, Fort Worth, and Galveston Districts:

4. For all activities proposed for authorization under Nationwide Permit (NWP) 12 that involve a discharge of fill material associated with mechanized land clearing of wetlands dominated by native woody shrubs, the applicant shall notify the appropriate District Engineer in accordance with the NWP General Condition 32 – Pre-Construction Notification prior to commencing the activity. For the purpose of this regional condition, a shrub dominated wetland is characterized by woody vegetation less than 3.0 inches in diameter at breast height but greater than 3.2 feet in height, which covers 20% or more of the area. Woody vines are not included.

The following regional conditions apply within the Albuquerque District.

- 5. Nationwide Permit (NWP) 23 Approved Categorical Exclusions. A pre-construction notification (PCN) to the District Engineer in accordance with General Condition 32 PCN is required for all proposed activities under NWP 23.
- 6. Nationwide Permit (NWP) 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities. For all proposed activities under NWP 27 that require preconstruction notification, a monitoring plan commensurate with the scale of the proposed restoration project and the potential for risk to the aquatic environment must be submitted to the Corps. (See "NWP 27 Guidelines" at http://www.spa.usace.army.mil/Missions/RegulatoryProgramandPermits/NWP.aspx).
- 7. Channelization. Nationwide Permit (NWP) General Condition 9 for Management of Water Flows is amended to add the following: Projects that would result in permanent channelization to previously un-channelized streams require pre-construction notification to the Albuquerque District Engineer in accordance with NWP General Condition 32 Pre-Construction Notification.
- 8. Dredge and Fill Activities in Intermittent and Perennial Streams, and Special Aquatic Sites: For all activities subject to regulation under the Clean Water Act Section 404 in intermittent and perennial streams, and special aquatic sites (including wetlands, riffle and pool complexes, and sanctuaries and refuges), pre-construction notification (PCN) to the Albuquerque District Engineer is required in accordance with Nationwide Permit General Condition 32 PCN.
- 9. Springs. For all discharges of dredged or fill material within 100 feet of the point of groundwater discharge of natural springs located in an aquatic resource, a preconstruction notification (PCN) is required to the Albuquerque District Engineer in accordance with Nationwide Permit General Condition 32 PCN. A natural spring is defined as any location where ground water emanates from a point in the ground and has a defined surface water connection to another waters of the United States. For purposes of this regional condition, springs do not include seeps or other groundwater discharges which lack a defined surface water connection.

10. Suitable Fill. Use of broken concrete as fill or bank stabilization material is prohibited unless the applicant demonstrates that its use is the only practicable material (with respect to cost, existing technology, and logistics). Any applicant who wishes to use broken concrete as bank stabilization must provide notification to the Albuquerque District Engineer in accordance with Nationwide Permit General Condition 32 - Pre-Construction Notification along with justification for such use. Use of broken concrete with rebar or used tires (loose or formed into bales) is prohibited in all waters of the United States.

The following regional conditions apply only within the Fort Worth District.

- 11. For all discharges proposed for authorization under all Nationwide Permits (NWP) into the area of Caddo Lake within Texas that is designated as a "Wetland of International Importance" under the Ramsar Convention, the applicant shall notify the Fort Worth District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification (PCN). The Fort Worth District will coordinate with the resource agencies as specified in NWP General Condition 32(d) PCN.
- 12. Compensatory mitigation is generally required for losses of waters of the United States that exceed 1/10 acre and/or for all losses to streams that exceed 300 linear feet. Loss is defined in Section F of the Nationwide Permits (NWP). Mitigation thresholds are cumulative irrespective of aquatic resource type at each single and complete crossing. Compensatory mitigation requirements will be determined in accordance with the appropriate district standard operating procedures and processes. The applicant shall notify the Fort Worth District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification prior to commencing the activity.
- 13. For all activities proposed for authorization under Nationwide Permits (NWP) 12, 14 and/or 33 that involve a temporary discharge of fill material into 1/2 acre or more of emergent wetland OR 1/10 acre of scrub-shrub/forested wetland, the applicant shall notify the Fort Worth District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification prior to commencing the activity.
- 14. For all discharges proposed for authorization under Nationwide Permits (NWP) 51 and 52, the Fort Worth District will provide the pre-construction notification (PCN) to the U.S. Fish and Wildlife Service as specified in NWP General Condition 32(d)(2) PCN for its review and comments.

The following regional conditions apply only within the Galveston District.

15. No Nationwide Permits (NWP), except NWP 3, shall be used to authorize discharges into the habitat types or specific areas listed in paragraphs a through c, below. The applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 - Pre-Construction Notification prior to commencing the activity under NWP 3.

- a. Mangrove Marshes. For the purpose of this regional condition, Mangrove marshes are those waters of the United States that are dominated by mangroves (Avicennia spp., Laguncuaria spp., Conocarpus spp., and Rhizophora spp.). b. Coastal Dune Swales. For the purpose of this regional condition, coastal dune swales are wetlands and/or other waters of the United States located within the backshore and dune areas in the coastal zone of Texas. They are formed as depressions within and among multiple beach ridge barriers, dune complexes, or dune areas adjacent to beaches fronting tidal waters of the United States. c. Columbia Bottomlands. For the purpose of this regional condition, Columbia bottomlands are defined as waters of the United States that are dominated by bottomland hardwoods in the Lower Brazos and San Bernard River basins identified in the 1997 Memorandum of Agreement between the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Natural Resource Conservation Service, and Texas Parks and Wildlife Department for bottomland hardwoods in Brazoria County. (For further information, see http://www.swg.usace.army.mil/Business-With-Us/Regulatory/Permits/Nationwide-General-Permits/)
- 16. A Compensatory Mitigation Plan is required for all special aquatic site losses, as defined in Section F of the Nationwide Permits (NWP), that exceed 1/10 acre and/or for all losses to streams that exceed 200 linear feet. Compensatory mitigation requirements will be determined in accordance with the appropriate district standard operating procedures and processes. The applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification prior to commencing the activity.
- 17. For all seismic testing activities proposed for authorization under Nationwide Permit (NWP) 6, the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification (PCN). The PCN must state the time period for which the temporary fill is proposed, and must include a restoration plan for the special aquatic sites. For seismic testing under NWP 6 within the Cowardin Marine System, Subtidal Subsystem; as defined by the U.S. Fish and Wildlife Service, Classification of Wetlands and Deepwater Habitats of the United States, December 1979/Reprinted 1992, the Corps will coordinate with the resource agencies in accordance with NWP General Condition 32(d) PCN.
- 18. For all activities proposed under Nationwide Permits (NWP) 10 and 11 located in vegetated shallows and coral reefs; as defined by 40 CFR 230.43 and 230.44 respectively, the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification. Examples include, but are not limited to: seagrass beds, oyster reefs, and coral reefs.
- 19. Nationwide Permit 12 shall not be used to authorize discharges within 500 feet of vegetated shallows and coral reefs; as defined by 40 CFR 230.43 and 230.44 respectively. Examples include, but are not limited to: seagrass beds, oyster reefs, and coral reefs.

- 20. For all activities proposed for authorization under Nationwide Permit 12 that involve underground placement below a non-navigable river bed and/or perennial stream bed there shall a minimum cover of 48 inches (1,219 millimeters) of soil below the river and/or perennial stream thalweg.
- 21. For all discharges and work proposed below the high tide line under Nationwide Permits (NWP) 14 and 18, the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification (PCN). The Galveston District will coordinate with the resource agencies in accordance with NWP General Condition 32(d) PCN.
- 22. For all activities proposed for authorization under Nationwide Permit (NWP) 33 the applicant shall notify the Galveston District Engineer in accordance with the NWP General Condition 32 Pre-Construction Notification (PCN). The PCN must include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. Activities causing the temporary loss, as defined in Section F of the NWPs, of more than 0.5 acres of tidal waters and/or 200 linear feet of stream will be coordinated with the agencies in accordance with NWP General Condition 32(d) PCN.
- 23. No Nationwide Permits (NWP), except NWPs 3, 16, 20, 22, 37, shall be used to authorize discharges, structures, and/or fill within the standard setback and high hazard zones of the Sabine-Neches Waterway as defined in the Standard Operating Procedure Permit Setbacks along the Sabine-Neches Waterway. The applicant shall notify the Galveston District Engineer in accordance with NWP General Condition 32 Pre-Construction Notification for all discharge, structures and/or work in medium hazard zones and all NWP 3 applications within the standard setback and high hazard zones of the Sabine-Neches Waterway.
- 24. No Nationwide Permits (NWP), except 20, 22, and 37, shall be used to authorize discharges, structures, and/or fill within the standard setback exemptions of the Gulf Intracoastal Waterway as defined in the Standard Operating Procedure- Department of the Army Permit Evaluation Setbacks along the Gulf Intracoastal Waterway. The applicant shall notify the Galveston District Engineer in accordance with NWP General Condition 32 (Pre-Construction Notification) for all discharges, structures and/or work within the standard setback, shoreward of the standard setback, and/or standard setback exemption zones.
- 25. The use of Nationwide Permits in the San Jacinto River Waste Pits Area of Concern are revoked. (For further information, see http://www.swg.usace.army.mil/Business-With-Us/Regulatory/Permits/Nationwide-General-Permits/)
- 26. The use of Nationwide Permits 51 and 52 are revoked within the Galveston District boundaries.

- 27. Nationwide Permit (NWP) 53 pre-construction notifications will be coordinated with resource agencies as specified in NWP General Condition 32(d) Pre-construction Notification.
- 28. For all activities proposed under Nationwide Permits (NWP) 21, 29, 39, 40, 42, 43, 44, and 50 that result in greater than 300 feet of loss in intermittent and/or ephemeral streams, as defined in Section F of the NWPs, require evaluation under an Individual Permit.

The following regional conditions apply only within the Tulsa District.

- 29. Upland Disposal: Except where authorized by Nationwide Permit 16, material disposed of in uplands shall be placed in a location and manner that prevents discharge of the material and/or return water into waters or wetlands unless otherwise authorized by the Tulsa District Engineer.
- 30. Major Rivers: The prospective permittee shall notify the Tulsa District Engineer for all Nationwide Permit 14 verifications which cross major rivers within Tulsa District. For the purposes of this condition, major rivers include the following: Canadian River, Prairie Dog Town Fork of the Red River, and Red River.