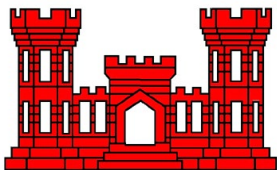


DRAFT ENVIRONMENTAL ASSESSMENT

Mississippi River Mainline Levee Phillippy Seepage Remediation Lake County, Tennessee

DRAFT



**U.S. Army Corps of Engineers
Mississippi Valley Division
Regional Planning and Environmental Division South**

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DRAFT ENVIRONMENTAL ASSESSMENT

Mississippi River Mainline Levee Phillippy, Tennessee Seepage Berm Lake County, Tennessee

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi River Valley Regional Planning and Environmental Division South, has prepared this draft environmental assessment (EA) for the Memphis District (MVM) to evaluate the potential impacts associated with the construction of a seepage control berm with minor maintenance to include some vegetation removal and slope flattening along approximately 0.7 of a mile along the Mississippi River mainline levee (MRL), near Phillippy in Lake County, Tennessee (Figure 1).

This draft EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation ER 200-2-2. This draft EA provides sufficient information on the potential adverse and beneficial environmental effects to allow the District Commander, USACE, MVM, to make an informed decision on the appropriateness of an environmental impact statement (EIS) or a finding of no significant impact (FONSI).

A 1998 final Supplemental EIS (SEIS), *Mississippi River Mainline Levees Enlargement and Seepage Control*, addressed seepage control measures to be implemented along the Mississippi River Levee (MRL). While berm construction in this area was covered under the SEIS, it was determined that additional rights of way were needed and potential environmental impacts were identified within a Wetland Reserve Program (WRP) easement held by the Natural Resources Conservation Service (NRCS).

1.1 Proposed Action

The proposed project involves implementing seepage control measures and minor maintenance of the levee slope along the MRL in Lake County, Tennessee. The northern limit of the project begins at approximately 36.49556111, -89.40300278 or Baseline Station 16/52+36, and extends south 0.7 of a mile to 36.48577222, -89.40599444 or Baseline Station 17/36+32. The seepage berm extends from the northern limit of the project to approximately 36.49097778, -89.40464722 or Baseline Station 17/13+79 (Figure 1). The remainder of the work requires small vegetation removal and minor slope flattening to improve stability and allow for regular maintenance work.

The proposed project involves implementing seepage control measures identified in the SEIS along the MRL in Lake County, Tennessee. Project features (Figure 1) for the proposed seepage remediation action include construction of one seepage remediation berm totaling approximately 7.2 acres; slope flattening beginning at the southerly end of the berm and extending for approximately 2,000 feet along the existing slope, and an approximately 4.75-acre borrow pit to provide the required earthen material.

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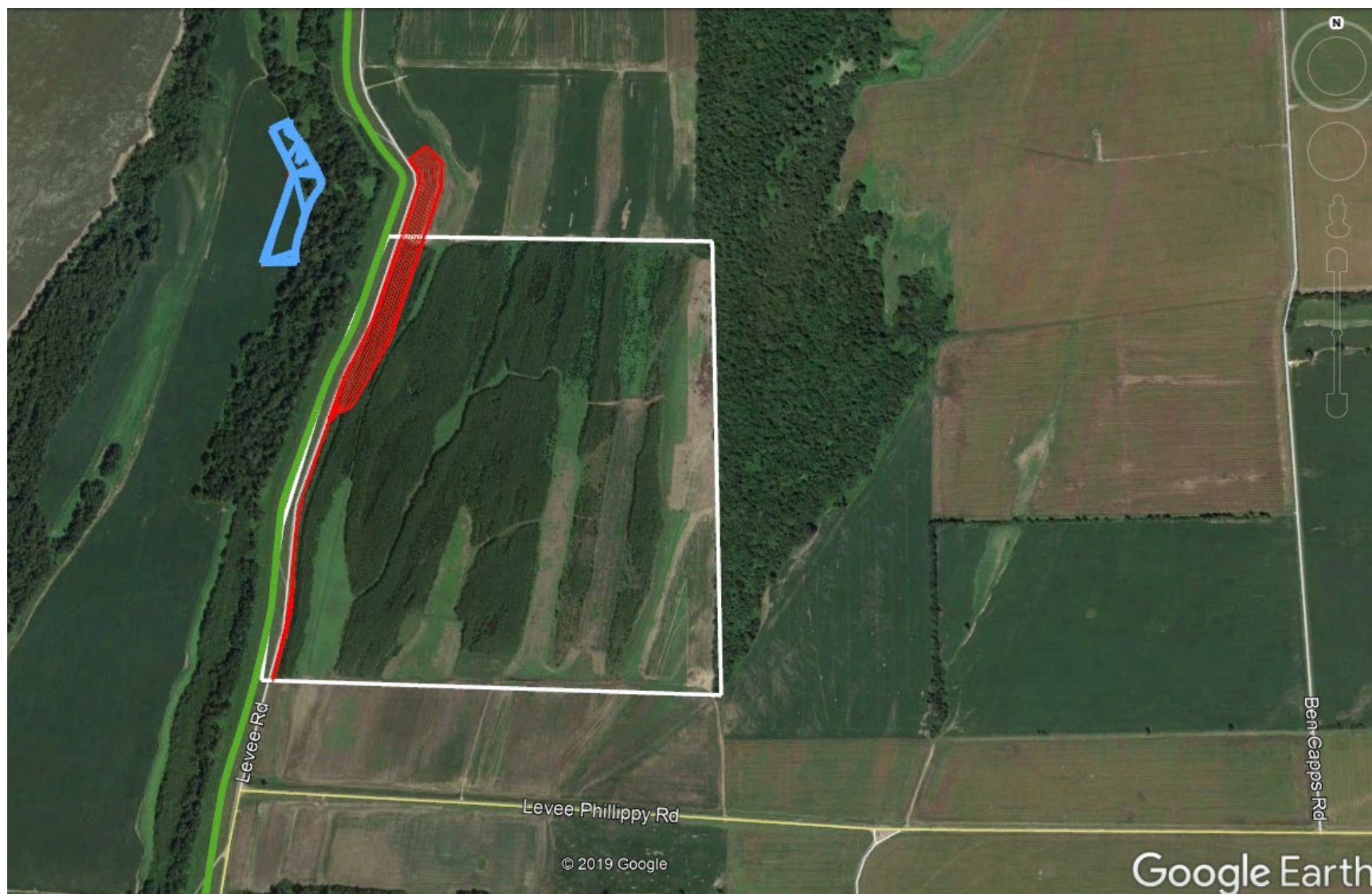


Figure 1. Aerial imagery showing the proposed Phillippy Seepage Remediation project in Lake County Tennessee. The NRCS Wetland Reserve Program Easement (approximate) is shown in white outline; the proposed seepage berm and slope flattening is shown in red outline; and the proposed borrow site is shown in blue outline.

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The seepage berm would permanently impact approximately 1 acre of agricultural land exhibiting some wetland characteristics and approximately 3.15 acres located within a NRCS WRP easement consisting of young (~10 year old) forested wetland. The remainder of the area is already maintained by mowing, and no additional impacts have been identified for the berm. No environmental impacts were identified with the slope flattening, which would total approximately 1.5 acres. The borrow pit would impact approximately 0.85-acre of agricultural land exhibiting some wetland characteristics, which rests at a lower elevation than the surrounding field.

In addition to the items described above, additional items include placing filter fabric and road gravel within the established roadway, establishing turf in disturbed areas, providing traffic control, and utilizing best management practices.

1.2 Purpose and Need for the Proposed Action

The Phillipy Berm Project was designed due to seepage issues, and was addressed in the final SEIS. During the floods of 2011 and 2015, seepage issues were again observed by Corps personnel. The purpose of the proposed action is to control seepage under the MRL during flood events on the Mississippi River to prevent levee damage or failure. While berm construction in this area was covered under the SEIS, it has been determined that additional right of way is required and potential environmental impacts have been identified. The minor vegetation removal and slope flattening outside of the berm construction area are an addition to the original plans, and are intended to improve the ability of the local sponsor to complete regular maintenance.

1.3 Authority for the Proposed Action

The proposed action is authorized as part of the Flood Control Act of 1928, as amended.

1.4 Prior Reports

The final *Mississippi River Mainline Levees Enlargement and Seepage Control*, SEIS was completed in 1998, and addressed seepage control measures to be implemented along the Mississippi River Levee (MRL) including this action.

1.5 Public Concerns

Public concerns exist regarding the ability of the MRL to contain floodwaters during a flood event. Seepage and piping would eventually undermine the levee causing it to breach if unabated, thus posing a threat of flooding. A levee breach would flood the surrounding lands and residential areas, and threaten the lives and property of residents within the flooded areas. The record level flooding of the Mississippi River in May 2011 has heightened public concerns.

2.0 ALTERNATIVES TO THE PROPOSED ACTION

Three alternatives were considered for the proposed action. These alternatives were: 1) no-action; 2) installation of relief wells and associated drainage work; and 3) construct a landside berm.

2.1 Alternative 1 – Future without Project Condition (No-Action)

In the future without project condition (no-action), the proposed action would not be constructed. The no-action alternative would result in continued seepage and piping during flood conditions. Sands and silts would be carried under the levee, which could lead to a levee breach.

2.2 Alternative 2 – Install Relief Wells with Associated Drainage Work

Relief wells and associated drainage ditches were considered to control seepage along the MRL in this area. However, relief wells would not prevent piping if backwater has entered the landside levee area; therefore, this alternative is not acceptable for this area due to the regular occurrence of backwater flooding.

2.3 Alternative 3 – Construct a Landside Berm

This project feature was considered in the 1998 SEIS, and involves constructing a seepage berm along the landside toe of the MRL to control seepage and piping under the levee. Approximately 50,000 cubic yards of material would be required for construction of the seepage berm. This material would be excavated from the borrow pit on the riverside of the levee. The borrow pit has been designed to avoid environmental impacts to the existing forested area. In addition to the seepage berm, slope flattening beginning at the southerly end of the berm and extending for approximately 2,000 feet along the existing slope, would occur to provide for regular maintenance. Temporary impacts to local roadways and the public use of those roads would result, as haul trucks would be needed to transport the material to the project site; however, a traffic plan is being developed with the Tennessee Department of Transportation.

2.4 Preferred Alternative for the Proposed Project

After careful consideration of all alternatives, it was determined that alternative 1 (no-action) was unacceptable because of risks to human life and property. If a seepage problem is not addressed, levee failure resulting in catastrophic impacts could ultimately result. Due to the ineffectiveness of relief wells in this case due to backwater flooding, Alternative 2 is not practicable or reasonable. Alternative 3 is the only effective method for controlling seepage and piping in the identified seepage locations. All factors considered, Alternative 3 is the most practical solution for seepage control and is the preferred alternative for the proposed project.

3.0 AFFECTED ENVIRONMENT

3.0.1 Environmental Setting

The proposed seepage control project is located in Lake County, Tennessee. During the summer of 2019, MVM biologists performed a site assessment of the proposed project area. A WRP easement owned by the NRCS exists along the majority of the berm construction area. The easement, consisting of a young (~10 year old) forested wetland, currently exists within the project area (Figure 1). The dominant tree species is cottonwood; however, during a site visit in September, several small oaks and cypress trees (likely planted saplings) were noted within the proposed area of impact. Hydric indicators were present including water stained leaves and water lines. The northern end of the project area includes agricultural land exhibiting some wetland characteristics that would be impacted. On the riverside of the levee within the proposed footprint for the borrow area, row crop agricultural production is dominant which includes some agricultural lands exhibiting wetland characteristics. A forested area that was likely used for borrow in the past exists, but would not be impacted by the project. Noted tree species included cottonwood, black willow, sycamore, American elm, sugarberry, silver maple, pecan, and various oak species.

3.0.2 Description of the Watershed

The project area lies within the Mississippi Alluvial Plain and sits in the shared floodplain between the Mississippi and Obion rivers in Lake County, Tennessee. The 8-digit Hydrologic Unit Code (HUC) for the proposed borrow pit is the Mississippi River Basin (TN08010100) and consists mainly of the Mississippi River channel and adjacent floodplain. The predominant land use is a mixture of woody wetlands (vegetated islands and riparian vegetation) and agricultural row-crop production. The 8-digit HUC for the berm construction and slope flattening area is the Obion River Basin (TN08010102) which encompasses approximately 1,313 square miles and drains into the Mississippi River.

3.0.3 Climate

The average annual temperature for Lake County is 61 degrees Fahrenheit. The average daily maximum temperature for the area is 70 degrees Fahrenheit with 2 years in every 10 having temperatures greater than 100 degrees Fahrenheit occurring in July. The average daily minimum temperature is 51 degrees Fahrenheit with 2 years in every 10 having temperatures less than 2 degrees Fahrenheit occurring in January. Yearly precipitation averages 51 inches. Rainfall will average less than 35 inches and greater than 58 inches 2 out of every 10 years. The month receiving the most rainfall is December with an average of 5.2 inches and the month receiving the least is September with an average of 2.9 inches. Most precipitation falls in the form of rain; however snow may fall in the months of November through March.

3.0.4 Geology

The proposed project area is located within the Mississippi Alluvial Valley, which formed by glacial melt waters carrying large amounts of water, silt, sand, and gravel from the country's interior down to the Gulf Coast. The alluvial valley is bordered on the east by bluffs and on the west by merging valleys of the principal tributaries and ranges in width from approximately 30 to 90 miles (Saucier 1994). Quaternary deposits within the alluvial valley consist of various abandoned channels and point bar deposits of historic Mississippi River meander belts. The fluvial-geomorphic history determines the individual soil types at specific locations. The majority of the soils within the immediate project footprint are Bowdre and Tunica clays.

3.1 Relevant Resources

This section contains a description of relevant resources that could be impacted by the project. The relevant resources (Table 1) described in this section are those recognized by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. The following resources have been considered and found to not be affected by the alternative under consideration: freshwater marshes, freshwater lakes, state-designated scenic streams, fisheries, municipal facilities, municipal utilities, roadways, recreation, and aesthetics. Additionally, proposed alternatives would not be expected to have disproportionate adverse environmental or health effects on minority or low-income populations, as the reduction in flood risk provided would be beneficial to all area residents. Therefore, the proposed project is in full compliance with Executive Order 12898, Environmental Justice in Minority and Low-Income Populations.

Table 1. Relevant Resources that could potentially be impacted by the project.

| Resource | Institutionally Important | Technically Important | Publicly Important |
|--|--|---|--|
| Agricultural Lands | Food Security Act of 1985, as amended; the Farmland Protection Policy Act of 1981 | The habitat provided for the provision or potential provision of human and livestock food products. | The present economic value or potential for future economic value. |
| Wetlands | Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; EO 11988, and Fish and Wildlife Coordination Act. | They provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities. | The high value the public places on the functions and values that wetlands provide. Environmental organizations and the public support the preservation of wetlands. |
| Wildlife | Fish and Wildlife Coordination Act of 1958, as amended and the Migratory Bird Treaty Act of 1918. | They are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources. | The high priority that the public places on their esthetic, recreational, and commercial value. |
| Threatened and Endangered Species | The Endangered Species Act of 1973, as amended;; and the Bald Eagle Protection Act of 1940. | USACE, USFWS, NRCS, USEPA, and TWRA cooperate to protect these species. The status of such species provides an indication of the overall health of an ecosystem. | The public supports the preservation of rare or declining species and their habitats. |
| Cultural Resources | National Historic Preservation Act of 1966, as amended; the Native American Graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979 | State and Federal agencies document and protect sites. Their association or linkage to past events, to historically important persons, and to design and construction values; and for their ability to yield important information about prehistory and history. | Preservation groups and private individuals support protection and enhancement of historical resources. |
| Air Quality | Clean Air Act of 1963. | State and Federal agencies recognize the status of ambient air quality in relation to the NAAQS. | Virtually all citizens express a desire for clean air. |
| Hydrology and Water Quality | Clean Water Act of 1977, Fish and Wildlife Coordination Act. | State and federal agencies recognize value of fisheries and good water quality. The National and state standards are established to assess water quality. | Environmental organizations and the public support the preservation of water quality and fishery resources and the desire for clean drinking water. |

3.1.1 Agricultural Lands

Existing Conditions

Landside of the MRL, agricultural fields are the dominant land use and approximately 6.75 acres of farmland would be impacted with the implementation of this project, with approximately 1.85 acres exhibiting some wetland characteristics. Utilizing the U.S. Department of Agriculture Web Soil Survey (<https://websoilsurvey.nrcs.usda.gov/app/>), it was determined that the area may be eligible for classification as prime farmland. A Farmland Conversion Impact Rating form was sent to the NRCS for a determination. The four primary crops grown in the area are corn, cotton, soybeans, and wheat.

3.1.2 Wetlands

Existing Conditions

The riparian vegetation adjacent to the riverside toe of the MRL adjacent to the proposed borrow pit is comprised of bottomland hardwood species and is identified as Freshwater Forested/Shrub Wetlands and Freshwater Emergent Wetlands on the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps. An NRCS WRP easement consisting of a young (~10 year old) forested wetland currently exists within the project area (Figure 1). The dominant tree species is cottonwood; however, during a site visit in September, several small oaks and bald cypress trees (likely planted saplings) were noted within the proposed area of impact. Hydric indicators were present including water stained leaves and water lines. In addition, the berm would impact approximately 1 acre of agricultural land exhibiting some wetland characteristics; and the borrow pit would impact approximately 0.85-acre of agricultural land that exhibits some wetland characteristics. The area has a lower elevation than the surrounding field, floods early and often, exhibits cracked soils and flood tolerant vegetation in some areas (*Xanthium strumarium*), and aerial photography shows characteristics that indicate inundation.

3.1.3 Wildlife

Existing Conditions

Wildlife species that could be expected to be found within the project area include coyotes, deer, raccoons, opossums, rabbits, gray and fox squirrels, muskrats, mice, rats, shrews, songbirds, turtles, snakes, amphibians, and other small animals typically found along the Mississippi River levees.

3.1.4 Threatened and Endangered Species

Existing Conditions

According to results obtained from the USFWS Information, Planning, and Conservation (IPaC) conservation planning tool, there are a total of three threatened, endangered, or candidate species known to be found within the proposed project area. These species are the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), and least tern (*Sterna antillarum*). Of

these four species, only the endangered Indiana bat and threatened northern long-eared bat would potentially utilize the forested habitat within the project area. In the lower Mississippi River (LMR), interior least terns typically nest on large isolated sandbars from late May to August, depending on timing and duration of low river stages, and are not found within the proposed project area.

In the summer of 2019, MVM biologists conducted a site assessment of the proposed project area. Vegetation proposed to be cleared was examined for the presence of potentially suitable roosting habitat for the Indiana and northern long-eared bats. Dominant tree species include cottonwood and small oaks and bald cypress saplings. USACE determined that potentially suitable summer roosting habitat is not present within the proposed project area. The borrow area would require removal of six pecan trees; however, no suitable habitat was observed.

3.1.5 Cultural Resources

Existing Conditions

A literature review supplemented by a cultural resources survey within the project's Area-of-Potential-Effect (APE) was completed by American Resources Group, Inc. in 1979, and no archeological sites were identified. Two standing structure complexes were identified, but were not eligible for the national register and are no longer standing. Therefore no historic properties would be affected.

3.1.6 Air Quality

Existing Conditions

The proposed project area is in attainment for all air quality standards. As equipment to be used during construction is a mobile source, the project is exempt from air quality permitting requirements. Although air emissions would not require a permit, best management practices shall be used throughout the construction to minimize air pollution.

3.1.7 Hydrology and Water Quality

Existing Conditions

According to the Tennessee Department of Environment and Conservation (TDEC), the Mississippi River in this area supports recreation, industrial water supply, fish and aquatic life, livestock watering and wildlife, irrigation and navigation; however, it does not support domestic water supply. The Mississippi River in Lake County is listed as impaired on the final 2016 303(d) list and the draft 2020 303(d) list because it was not fully supporting designated use classifications due to physical substrate habitat alterations, elevated levels of chlordane, dioxins, and polychlorinated biphenyls (PCBs) in sediment samples (TDEC 2017).

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Agricultural Lands

Future Conditions with No Action

Without implementation of the proposed action, agricultural lands (prime and unique farmland) within the project area are expected to remain as noted in Existing Conditions, provided that the adjacent levee remains stable. However, continued seepage could lead to a levee failure during a major flood event. Floodwaters could negatively impact existing agricultural lands through excess deposition of sand and gravel.

Future Conditions with the Proposed Action

The NRCS was contacted regarding the presence of prime and unique farmland in the project vicinity, and is currently determining the acreage that would be impacted by the construction of this project. Results of coordination would be included in the final EA and FONSI.

4.2 Wetlands

Future Conditions with No Action

Without implementation of the proposed action, wetland habitats within the project area are expected to remain as noted in Existing Conditions, provided that the adjacent levee remains stable. However, continued seepage could lead to a levee failure during a major flood event. Floodwaters could negatively impact existing wetlands through excess deposition of sand and gravel.

Future Conditions with the Proposed Action

With implementation of the proposed action, 3.15 acres of the WRP site would be filled to a depth of approximately 5-7 feet. The berm would extend approximately 150 feet from the County Road at the toe of the levee into the WRP site. The northern portion of the berm would fill approximately 1 acre of agricultural lands exhibiting some wetland characteristics, and would be constructed in the same manner as described above. This area would be maintained by mowing in perpetuity.

The proposed 4.75-acre borrow site would require excavation of approximately 0.85 of an acre of agricultural lands exhibiting wetland characteristics to an elevation of approximately 287 feet, approximately 5 feet deeper than the current elevation. Post-construction, the full borrow site would naturally re-vegetate to a habitat type similar to the existing borrow pit that was used to construct the MRL, effectively enlarging the areal extent of the open water/wetland complex. The existing borrow site is currently dominated by black willow, cottonwood, oak, pecan/hickory, and bald cypress with varying elevations. Approximately 6 pecan trees would be cleared for borrow pit, but no other tree clearing is expected for the proposed borrow pit.

Mitigation for the loss of 3.15 acres of forested wetlands within the WRP site would be accomplished through on-site restoration and improvements, and is being coordinated with the NRCS. Approximately 1.85 acres of farmland would be restored to bottomland hardwoods as described in the Mitigation Section (6.0) below to compensate for the loss and functional change of 0.85 acre of agricultural lands exhibiting wetland characteristics to open water and the loss of 1 acre of agricultural lands exhibiting wetland characteristic to the proposed berm.

4.3 Wildlife

Future Conditions with No Action

Without implementation of the proposed action, the wildlife resources within the project area are expected to remain as noted in Existing Conditions under normal conditions. However, a levee breach may cause impacts to forested lands and other habitats that are utilized by native wildlife.

Future Conditions with the Proposed Action

With implementation of the proposed action, impacts to wildlife resources would include the loss of approximately 3.15 acres of the current WRP footprint due to berm construction. Post-construction, the borrow site would re-vegetate naturally as noted in above in Section 4.2. Additionally, disturbance and noise from the construction equipment would temporarily disperse wildlife species from the project area. However, once the project is completed, wildlife species would be expected to return to the project area. The loss of habitat and temporary disturbance would not adversely impact the general populations of wildlife species within the region, as forested areas and suitable habitat is readily available within the vicinity of the project area.

4.4 Threatened and Endangered Species

Future Conditions with No Action

Without implementation of the proposed action, threatened and endangered species within the project area are expected to remain as noted in existing conditions.

Future Conditions with the Proposed Action

In the lower Mississippi River (LMR), interior least terns typically nest on large isolated sandbars from late May to August, depending on timing and duration of low river stages, and are not found within the proposed project area. No potentially suitable habitat for threatened or endangered bats was noted in the proposed project area. Therefore, USACE has determined that there would be no effect to the Indiana or northern long-eared bat, or interior least tern.

4.5 Cultural Resources

Future Conditions with No Action

Without implementation of the proposed action, cultural resources are expected to remain as noted in Existing Conditions. However, continued seepage could lead to a levee failure during a major flood event, potentially impacting cultural resources that have not been identified.

Future Conditions with the Proposed Action

No historic properties would be affected by completion of the proposed action. Coordination with the federally recognized Native American Tribes within MVM, as well as with the Tennessee State Historic Preservation Office is being conducted with the circulation of this draft EA. No additional cultural resources investigations are recommended prior to the project's implementation.

4.6 Air Quality

Future Conditions with No Action

Without implementation of the proposed action, no change in air quality would occur.

Future Conditions with the Proposed Action

With implementation of the proposed action, project-related equipment would produce small amounts of engine exhaust during construction activities. The temporary, minor impacts to air quality would be localized to the project area, and would not affect area residents. The project area would still be in attainment for all air quality standards. Since the equipment to be used is a mobile source, the project is exempt from air quality permitting requirements. Although air emissions would not require a permit, best management practices shall be used throughout the construction to minimize air pollution.

4.7 Hydrology and Water Quality

Future Conditions with No Action

Without implementation of the proposed action, hydrology and water quality within the project area would remain as noted in Existing Conditions.

Future Conditions with the Proposed Action

With implementation of the proposed action, overall hydrology and water quality would remain as noted in Existing Conditions. The seepage berm would remove some flood storage capacity. However, this is considered negligible; and no impacts to the agricultural land or WRP site outside of the proposed footprint would occur. A temporary increase in turbidity in the wetland adjacent to the borrow pit may occur during excavation; however, best management practices would be followed. Placement of material for the proposed berm would be conducted in the dry, and no impacts to water quality are expected. Thus, no significant impacts to water quality would occur as a result of the proposed project. A Section 404(b)(1) evaluation was prepared for

the proposed project action and is included as Appendix A. A state water quality certification has been requested from the State of Tennessee, Department of Environment and Conservation.

4.10 Hazardous, Toxic, and Radioactive Waste (HTRW)

USACE is obligated under Engineer Regulation (ER) 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within the vicinity of proposed actions. ER 1165-2-132 identifies that HTRW policy is to avoid the use of project funds for HTRW removal and remediation activities. An HTRW evaluation report was prepared by Gulf Engineers and Consultants in February 1998 in support of the SEIS, and no indications for HTRW concerns were encountered. Gulf Engineers and Consultants performed an environmental record search and site survey that did not identify the presence of any hazardous or suspected hazardous wastes in the project area. The results were compiled and reported in *Hazardous, Toxic, and Radioactive (HTRW) Evaluation Supporting Supplement 1 to the Final Environmental Impact Statement, Mississippi River and Tributaries Project Mississippi River Mainline Levee*.

A record search was conducted on the Environmental Protection Agency's (EPA) EnviroMapper for Envirofacts web site (<https://www.epa.gov/emefdata/em4ef.home>). The web site was checked for any superfund sites, toxic releases, or hazardous waste sites within the vicinity of the proposed project area. Additionally, a site inspection of the proposed project was conducted by MVM personnel during the summer of 2019.

As a result of these assessments, it was concluded that the probability of encountering HTRW is low. If any hazardous waste/substance is encountered during construction activities, the proper handling and disposal of these materials would be coordinated with the EPA and applicable state agencies.

4.11 Cumulative Impacts

The Council on Environmental Quality's (CEQ) regulations (40 CFR 1500-1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.) define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7)". Cumulative Effects can result from individually minor but collectively significant actions taking place over a period of time."

A final SEIS, *Mississippi River Mainline Levees Enlargement and Seepage Control*, was completed in July 1998 to address all remaining work on the levee enlargement and seepage control project. The seepage problems at the proposed project locations were anticipated when the SEIS was completed. Benefits resulting from cumulative effects documented in the SEIS included: 1) the mitigation plan and borrow area reforestation which resulted in a net gain of 4,070 acres of bottomland hardwoods; 2) incremental impacts which resulted in a net gain in nationally significant habitat and environmental values; 3) the action would not improve or worsen any cumulative effects associated with the existing Mississippi River Levees; 4) the

project did not affect the hypoxia zone in the Gulf of Mexico; and 5) the environmental design and compensation features result in a net increase in terrestrial, wetland, waterfowl, and aquatic resource values such that no significant cumulative environmental impact resulted on an ecosystem, landscape, or regional scale.

Impacts of the proposed project action were evaluated during the preparation of this EA on the natural and human environment. A total of approximately 3.15 acres of forested wetlands and 1.85 acres of agricultural land that exhibiting some wetland characteristics would be impacted by the proposed project action. The proposed mitigation would include restoring approximately 1.85 acres of agricultural land to high quality bottomland hardwood forest, as well as improvements to the WRP site based on coordination with the NRCS. The impacts associated with the proposed project activities would not have any significant adverse cumulative effects on the environment in addition to those reported in the 1998 SEIS.

5.0 COORDINATION

Preparation of this draft EA and draft FONSI was coordinated with the project interagency environmental team. The team is comprised of representatives from USACE, USFWS, Tennessee Department of Environment and Conservation, and the Tennessee Wildlife Resource Agency. In addition, this draft EA is being coordinated with the Tennessee State Historic Preservation Office, federally recognized tribes, and other interested parties.

6.0 MITIGATION

The Clean Water Act, the Water Resources Development Act, Rule 33 CFR §332, the 2008 Compensatory Mitigation Rule, et al. require that compensatory mitigation is completed to offset unavoidable impacts incurred due to a water resources project. The appropriate application of compensatory mitigation is to formulate an alternative that first avoids, then minimizes, and lastly, compensates for unavoidable adverse impacts. This draft EA evaluates the potential impacts associated with the proposed construction of the seepage berms and associated borrow site.

After practicable avoidance and minimization measures were applied, a total of approximately 3.15 acres of forested wetlands and 1.85 acres of agricultural lands exhibiting wetland characteristics would be impacted by the proposed project. The USACE was able to move the borrow pit out of the forested area preventing approximately 5 acres of additional wetland impacts. Compensatory mitigation requirements entail restoration of 1.85 acres of forested bottomland hardwood (BLH) wetlands, as well as improvements to the WRP site based on coordination with the NRCS. Options for mitigating the WRP impacts may include planting BLH species and restoring hydrology, if necessary, within tracts of cleared agricultural land and/or the WRP site. The site to mitigate the impact to the 1.85 acres of wet agricultural land is anticipated to be located in Dyer County, Tennessee, as the USACE has begun the acquisition of 4 tracts of land totaling approximately 70 acres to mitigate for the unavoidable impacts that would be incurred due to these and future MRL project actions. A detailed, site-specific

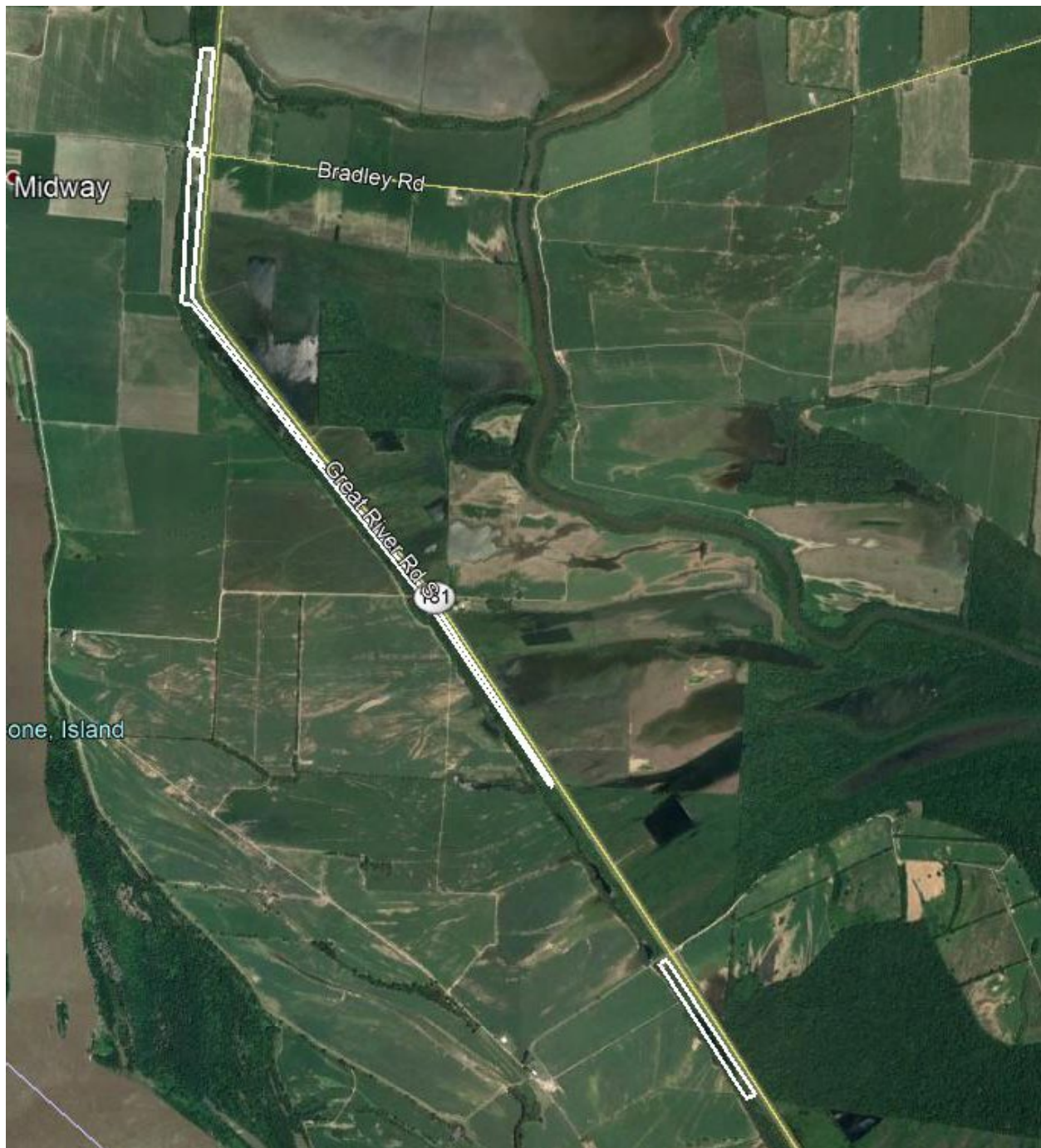


Figure 2. Aerial photograph showing four tracts of land, totaling approximately 70 acres in Dyer County, Tennessee, that are currently being acquired for the purpose of compensatory mitigation. The compensatory mitigation is required for the Mississippi River Levees Project.

mitigation plan has been drafted, and is included as Appendix B. Compensatory mitigation would occur concurrently with construction of the proposed project.

7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Environmental compliance for the proposed action would be achieved upon: coordination of this draft EA and draft FONSI with appropriate agencies, organizations, and individuals for their review and comments; completion of coordination with the USFWS regarding Federally listed endangered or threatened species; receipt of a Water Quality Certificate from the State of Tennessee; public review of the Section 404(b)(1) and Public Notice; signature of the Section 404(b)(1) Evaluation; and concurrence with the Determination of No Effect on cultural resources by the State Historic Preservation Officer. The draft FONSI will not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above.

7.1 Threatened and Endangered Species

Pursuant to Section 7 of the Endangered Species Act, it was determined that although the proposed project is within range of the Indiana and northern long-eared bats, and interior least tern, there would be no effect to any federally listed threatened or endangered species. In the lower Mississippi River (LMR), interior least terns typically nest on large isolated sandbars from late May to August, depending on timing and duration of low river stages, and are not found within the proposed project area. As sturgeon are limited to the nearby Mississippi River, they are not found within the proposed project area. No potentially suitable habitat for threatened or endangered bats was noted in the proposed project area. Therefore, USACE has determined that there would be no effect to the Indiana or northern long-eared bat, or interior least tern.

7.2 Cultural Resources

A literature review supplemented by a cultural resources survey within the project's Area-of-Potential-Effect (APE) was completed by American Resources Group, Inc. in 1979, and no archeological sites were identified. Two standing structure complexes were identified, but were not eligible for the national register and are no longer standing. Therefore no historic properties would be affected by completion of the proposed action. Coordination with the federally recognized Native American Tribes within MVM, as well as with the Tennessee State Historic Preservation Office is being conducted with the circulation of this draft EA. No additional cultural resources investigations are recommended prior to the project's implementation.

7.3 Water Quality Certification

No significant impacts to water quality would occur as a result of the proposed project. A Section 404(b)(1) evaluation was prepared for the proposed project action, and is included as Appendix A. A state water quality certification was requested from the State of Tennessee, Department of Environment and Conservation on 17 December 2019. The NEPA process would

not be considered complete and the FONSI would not be signed until the Section 401 Water Quality Certification (Alteration of Aquatic Resources Permit) is received by the USACE.

8.0 CONCLUSION

This project feature was considered in the 1998 SEIS, and involves constructing a seepage berm along the landside toe of the MRL to control seepage and piping under the levee. Approximately 50,000 cubic yards of material would be required for construction of the seepage berm. This material would be excavated from the borrow pit on the riverside of the levee. The borrow pit has been designed to avoid environmental impacts to the existing forested area. Temporary impacts to local roadways and the public use of those roads would result, as haul trucks would be needed to transport the material to the project site; however, a traffic plan is being developed with the Tennessee Department of Transportation.

The impacts associated with the proposed project activities would not cause significant adverse cumulative effects on the human environment in addition to those reported in the 1998 SEIS. This office has assessed the environmental impacts of the proposed action and has determined that the proposed work is expected to have minor impacts to agricultural lands, wetlands, wildlife, air quality, and hydrology. Impacts to wetlands and wildlife would be mitigated, as described above. Impacts to air quality and hydrology would be temporary and negligible. The proposed project would have no impacts upon threatened and endangered species, freshwater marshes, freshwater lakes, state designated scenic streams, cultural resources, municipal facilities, municipal utilities, socio-economic, or environmental justice. Therefore, a supplemental EIS is not required.

9.0 PREPARED BY

This draft EA and draft FONSI were prepared by Ms. Andrea Carpenter, MVM biologist, with cultural resources information provided by Ms. Pam Lieb, MVM archeologist. For additional information, contact Ms. Andrea Carpenter at (901) 544-0817, or by email at Andrea.L.Carpenter@usace.army.mil, or by mail at USACE Memphis District, Attn: Andrea Carpenter, 167 North Main St., RM-B202, Memphis, TN 38103-1894.

10.0 Literature Cited

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Appendix A

404(b)(1) Evaluation

DRAFT 404(b)(1) EVALUATION
Mississippi River Mainline Levee
Phillippy Berm Construction and Levee Rehabilitation
Lake County, Tennessee

I. Project Description

a. Location

The proposed project involves implementing seepage control measures and minor maintenance of the levee slope along the MRL in Lake County, Tennessee. The northern limit of the project begins at approximately 36.49556111, -89.40300278 or Baseline Station 16/52+36, and extends south 0.7 of a mile to 36.48577222, -89.40599444 or Baseline Station 17/36+32. The seepage berm extends from the northern limit of the project to approximately 36.49097778, -89.40464722 or Baseline Station 17/13+79.

b. General Description

The proposed project involves implementing seepage control measures identified in the SEIS along the MRL in Lake County, Tennessee. Project features for the proposed seepage remediation action include construction of one seepage remediation berm totaling approximately 7.2 acres; slope flattening beginning at the southerly end of the berm and extending for approximately 2,000 feet along the existing slope, and an approximately 4.75-acre borrow pit to provide the required earthen material.

The seepage berm would permanently impact approximately 1 acre of agricultural land exhibiting some wetland characteristics and approximately 3.15 acres located within a NRCS WRP easement consisting of young (~10 year old) forested wetland. The remainder of the area is already maintained by mowing, and no additional impacts have been identified for the berm. No environmental impacts were identified with the slope flattening, which would total approximately 1.5 acres. The borrow pit would impact approximately 0.85 of an acre of agricultural land exhibiting some wetland characteristics, which rests at a lower elevation than the surrounding field.

In addition to the items described above, additional items include placing filter fabric and road gravel within the established roadway, establishing turf in disturbed areas, providing traffic control, and utilizing best management practices.

c. Authority and Purpose

The proposed action is authorized as part of the Flood Control Act of 1928, as amended.

The Phillipy Berm Project was designed due to seepage issues, and was addressed in the final SEIS. During the floods of 2011 and 2015, seepage issues were again observed by Corps personnel. The purpose of the proposed action is to control seepage under the MRL during flood events on the Mississippi River to prevent levee damage or failure. While berm construction in this area was covered under the SEIS, it has been determined that additional right of way is required and potential environmental impacts have been identified. The minor vegetation removal and slope flattening outside of the berm construction area are an addition to the original plans, and are intended to improve the ability of the local sponsor to complete regular maintenance.

d. General Description of Dredged or Fill Material

1) General Characteristics of Material

Earthen material removed from the borrow pit would be comprised of clays. Material would be processed and woody debris removed prior to placement in levee embankment or seepage berms.

2) Quantity of Material

This proposed action would require approximately 50,000 cubic yards of material excavated from the agricultural land adjacent to the existing borrow pit on the riverside of the MRL.

3) Source of Material – The earthen material would be excavated from the proposed borrow pit which is currently in agricultural production. The proposed borrow pit lies adjacent to the existing pit on the riverside of the MRL.

e. Description of the Proposed Discharge Site(s)

1) Location – The excavated material would be used to create the new seepage berms along the landside of the MRL.

2) Size – The proposed seepage berm totals approximately 7.2 acres, and would permanently impact approximately 1 acre of agricultural land exhibiting some wetland characteristics and approximately 3.15 acres located within an NRCS WRP easement consisting of young (~10 year old) forested wetland. The remainder of the area is already maintained by mowing, and no additional impacts have been identified for the berm. No environmental impacts were identified with the slope flattening, which would total approximately 1.5 acres.

3) Type(s) of Habitat – The agricultural land which would be permanently impacted by placement of fill material provides foraging habitat for waterfowl and wading birds as well as many species of aquatic insects and amphibians. The WRP site is

of low maturity; however, it provides cover for several species of small mammals and reptiles as well as amphibians and songbirds.

- 4) Timing and Duration of Discharge – Construction is scheduled to commence in the spring of 2021 and would be complete in the fall of 2025. Every effort would be made to construct during periods of low water and dry conditions, and best management practices would be applied.

f. Description of Disposal Method

Excavated material from the borrow pit would be placed and graded with conventional earth moving equipment (e.g., bulldozers and excavators) to construct the seepage berm. Any stockpiling of material that is required would occur in non-wet agriculture fields or along the levee.

II. Factual Determinations

a. Physical Substrate Determinations

- 1) Substrate Elevation and Slope – Slopes along the proposed borrow pit would be constructed at a slope of 3-foot horizontal to 1-foot vertical.
- 2) Sediment Type – The dominant soil types within the project area are Bowdre and Tunica clays.
- 3) Dredged/Fill Material Movement – Material would be excavated from the existing ditches and transported, via haul trucks, to the placement sites.
- 4) Physical Effects on Benthos – N/A
- 5) Other Effects – N/A
- 6) Actions Taken to Minimize Impacts - The following actions would be implemented during construction to minimize impacts:
 - Effective erosion control would be in place prior to construction and maintained throughout the construction period.
 - Construction would take place during periods of low rainfall and low water stages.
 - Vegetation to be cleared would be the minimum necessary to allow for construction access.
 - All disturbed areas would be seeded within 30 days after construction is completed.
 - Construction debris would be kept from entering the existing wetland complex (historic borrow pit) and shall be disposed of properly.

- Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the water.

b. Water Circulation, Fluctuation, and Salinity Determinations

1) Water. No change in water quality is expected due to this action.

- a) Salinity – No expected change.
- b) Water Chemistry – The water chemistry of the project area would not be expected to change as a result of the excavation of material or placement of earthen material.
- c) Clarity – No expected change.
- d) Color – No expected change.
- e) Odor – No expected change.
- f) Taste – No expected change.
- g) Dissolved Gas Levels – No expected change.
- h) Nutrients – No expected change.
- i) Eutrophication – No expected change.
- j) Others as appropriate – N/A

2) Current Patterns and Circulation

- a) Current Patterns and Flow – No expected change.
- b) Velocity – No expected change.
- c) Stratification – No expected change.
- d) Hydrologic Regime – No expected change.

3) Normal Water Level Fluctuations – No expected change.

4) Salinity Gradients – N/A

- 5) Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above.

c. Suspended Particulate/Turbidity Determinations

- 1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site – The WRP site and agricultural land exhibiting some wetland characteristics would be filled and permanently impacted.

- 2) Effects on Chemical and Physical Properties of the Water Column

- a) Light Penetration – No expected change.
- b) Dissolved Oxygen – The farmed and mowed/maintained wetlands would be filled and permanently impacted.
- c) Toxic Metals and Organics – No effect on toxic metals and organics are expected.
- d) Pathogens – N/A
- e) Aesthetics – Aesthetics would be impacted during construction due to the presence of construction equipment. Post-construction, a seepage berm would stand where a young forested wetland once existed. The aesthetics would be similar to the levee that exists now adjacent to the project area.
- f) Others as Appropriate – None noted.

- 2) Effects on Biota

- a) Primary Production – Berm construction would remove 3.15 acres of forested wetlands and 1.85 acres of agricultural land exhibiting some wetland characteristics. It is expected that with time, the proposed borrow pit would resemble the existing adjacent borrow pit, effectively enlarging the areal extent of the open water/wetland complex.
- b) Suspension/Filter Feeders – N/A.
- c) Sight Feeders – N/A
- d) Actions taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above.

- d. Contaminant Determinations – It is not expected that any contaminants would be introduced or translocated due to construction. A hazardous, toxic, and radioactive waste survey has been conducted on the area. No potential sources of contamination were found.
- e. Aquatic Ecosystem and Organism Determinations
 - 1) Effects on Plankton – N/A
 - 2) Effects on Benthos – N/A.
 - 3) Effects on Nekton – N/A.
 - 4) Effects on Aquatic Food Web – It is expected that with time, the proposed borrow pit would resemble the existing adjacent borrow pit, effectively enlarging the areal extent of the open water/wetland complex. No long term impacts are expected. The berm construction area would no longer function as a wetland ecosystem; however, compensatory mitigation on the WRP site along with the compensatory mitigation site in Dyer County, Tennessee would prevent permanent losses.
 - 5) Effects on Special Aquatic Sites
 - a) Sanctuaries and Refuges – N/A
 - b) Wetlands – A total of approximately 3.15 acres of forested wetlands existing within a WRP site would be impacted by the proposed project. Coordination with the NRCS is on-going to determine the appropriate on-site mitigation.
 - c) Mud Flats – N/A
 - d) Vegetated Shallows – N/A
 - e) Coral Reefs – N/A
 - f) Riffle and Pool Complexes – N/A
 - 6) Threatened and Endangered Species –According to results obtained from the USFWS Information, Planning, and Conservation (IPaC) conservation planning tool, there are a total of four threatened, endangered, or candidate species known to be found within the proposed project area. These species are the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), and least tern (*Sterna antillarum*). Of these species, only the endangered Indiana bat and threatened northern long-eared bat would potentially utilize the forested habitat within the project area. In the lower Mississippi River (LMR), interior least terns

typically nest on large isolated sandbars from late May to August, depending on timing and duration of low river stages, and are not found within the proposed project area.

In the summer of 2019, MVM biologists conducted a site assessment of the proposed project area. Vegetation proposed to be cleared was examined for the presence of potentially suitable roosting habitat for the Indiana and northern long-eared bats. Dominant tree species include cottonwood and small oaks and bald cypress saplings. USACE determined that potentially suitable summer roosting habitat is not present within the proposed project area. The borrow area would require removal of six pecan trees; however, no suitable habitat was observed.

Pursuant to Section 7 of the Endangered Species Act, it was determined that although the proposed project is within range of the Indiana and northern long-eared bat, and interior least tern, there would be no effect to any federally listed threatened or endangered species.

- 7) Other Wildlife – With implementation of the proposed action, impacts to wildlife resources would include the loss of approximately 3.15 acres of the current WRP footprint due to berm construction. Post-construction, the borrow pit would vegetate naturally. This would replace the acreage that is impacted, as the borrow pit is expected to total approximately 4.75 acres.
- 8) Actions Taken to Minimize Impacts – Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above, chiefly construction would occur in low-flow periods and impact areas would be limited to the extent necessary for construction. Compensatory mitigation is described above in I. b. General Description.

f. Proposed Disposal Site Determinations

- 1) Mixing Zone Determinations – N/A
- 2) Determination of Compliance with Applicable Water Quality Standards – USACE-MVM, has requested water quality certification from the State of Tennessee, Department of Environment and Conservation. No project construction would occur until water quality certification is received.
- 3) Potential Effects on Human Use Characteristic
 - a) Municipal and Private Water Supply – N/A
 - b) Recreational and Commercial Fisheries – N/A
 - c) Water Related Recreation – N/A

- d) Aesthetics – Aesthetics would be impacted during construction due to the presence of construction equipment. Post-construction, a seepage berm would stand where a young forested wetland once existed. The aesthetics would be similar to the levee that exists now adjacent to the project area.
- e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves – N/A

Determination of Cumulative Effects on the Aquatic Ecosystem – The Council on Environmental Quality's (CEQ) regulations (40 CFR 1500-1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.) define cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7)”. Cumulative Effects can result from individually minor but collectively significant actions taking place over a period of time.”

A final SEIS, *Mississippi River Mainline Levees Enlargement and Seepage Control*, was completed in July 1998 to address all remaining work on the levee enlargement and seepage control project. The seepage problems at the proposed project locations were anticipated when the SEIS was completed. Benefits resulting from cumulative effects documented in the SEIS included: 1) the mitigation plan and borrow area reforestation which resulted in a net gain of 4,070 acres of bottomland hardwoods; 2) incremental impacts which resulted in a net gain in nationally significant habitat and environmental values; 3) the action would not improve or worsen any cumulative effects associated with the existing Mississippi River Levees; 4) the project did not affect the hypoxia zone in the Gulf of Mexico; and 5) the environmental design and compensation features result in a net increase in terrestrial, wetland, waterfowl, and aquatic resource values such that no significant cumulative environmental impact resulted in an ecosystem, landscape, or regional scale.

Impacts of the proposed project action were evaluated during the preparation of this EA on the natural and human environment. A total of approximately 3.15 acres of forested wetlands and 1.85-acre agricultural land exhibiting some wetland characteristics would be impacted by the proposed project action. For impacts to agricultural land exhibiting some wetland characteristics, the proposed mitigation includes restoring approximately 1.85 acres of agricultural land to high quality bottomland hardwood forest. Compensatory mitigation for impacts to the WRP site includes on-site improvements based on coordination with the NRCS. The impacts associated with the proposed project activities would not have any significant adverse cumulative effects on the environment in addition to those reported in the 1998 SEIS.

- g. Determination of Secondary Effects on the Aquatic Ecosystem – N/A

III. Findings of Compliance for MRL Seepage Control Measures

a. Evaluation of Availability of Practical Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem

A draft environmental assessment has been completed that addresses alternatives to the proposed action. The recommended plan was determined to be the most cost effective and practicable of the alternatives studied in detail. The no action alternative was determined not to be practical. The proposed action would protect existing public infrastructure, and private homes and businesses. Without installation of seepage control measures, the integrity of the levee would be compromised. Seepage could potentially undermine the levee and cause failure during a flood event.

b. Compliance with Applicable State Water Quality Standards

An application for State of Tennessee water quality certification has been submitted. A determination concerning water quality certification has not been made to date.

c. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 Of the Clean Air Act

Lake County, Tennessee is in attainment for all air quality standards. No significant impacts to air quality are expected. The equipment to be used is a mobile source. Therefore, the project is exempt from air quality permitting requirements.

d. Compliance with Endangered Species Act of 1973

No effect to threatened or endangered species is expected.

e. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

Not applicable.

f. Evaluation of Extent of Degradation of the Waters of the United States

1) Significant Adverse Effects on Human Health and Welfare

a) Municipal and Private Water Supplies – N/A

b) Recreation and Commercial Fisheries – N/A

c) Plankton – N/A

- d) Fish – N/A.
- e) Shellfish – N/A
- f) Wildlife – No significant impacts are expected.
- g) Special Aquatic Sites – N/A

2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems

No significant impacts are expected.

3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity, and Stability

No significant impacts are expected.

4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values

No significant impacts are expected.

g. Appropriate and Practical Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Actions that would be implemented during construction to minimize impacts have been previously described in the Factual Determinations section above, chiefly best management practices would be implemented and unavoidable impacts mitigated, construction would occur during low-flow periods, and impact areas would be limited to the extent necessary for construction.

h. On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material is:

- 1) ☐ Specified as complying with the requirements of these guidelines; or,
- 2) ☒ Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical mitigation and conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

All conditions from the Tennessee, Department of Environment and Conservation would be adhered to.

- 3) ☐ Specified as failing to comply with the requirements of these guidelines.

13 January 2019

Date

Andrea Carpenter

Andrea L. Carpenter

Biologist, USACE

CEMVN-PDC-UDC

Appendix B

Compensatory Mitigation Plan



**US Army Corps
of Engineers®**
Memphis District

**Mississippi River Mainline Levee
Enlargement and Seepage Control
Miston and Phillipy Tennessee Seepage Remediation
Dyer and Lake Counties, Tennessee**

**Revised
MITIGATION PLAN**

December 2019

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Introduction

The original mitigation plan is revised in this document to include the mitigation of impacts that would be incurred from the Miston and Phillipy Tennessee Seepage Remediation Projects (referred to hereafter as Projects). The project descriptions and detailed information can be found in the environmental assessments entitled *Mississippi River Mainline Levee, Miston Berm Construction and Levee Rehabilitation, Dyer and Lake Counties, Tennessee* and *Mississippi River Mainline Levee, Phillipy Seepage Remediation, Lake County, Tennessee* which are incorporated herein by reference, and can be found at <http://www.mvm.usace.army.mil/About/Offices/Regulatory/Public-Notices/>. This mitigation plan may be revised upon the identification of future civil works projects that may cause unavoidable impacts within the Mississippi, Obion, or Forked Deer River Basins in Tennessee, if deemed appropriate and acceptable to the interagency team.

This detailed mitigation plan provides information on the activities that would compensate for unavoidable impacts expected to be incurred by the Projects. The restoration work would occur along the Hickman, Kentucky to Obion River section of the Mississippi River Levee in Dyer and Lake Counties, Tennessee.

The Miston Project is expected to impact a total of approximately 3.3 acres of forested wetlands, 0.85 acres of farmed wetland, 0.14 acres of mowed/maintained wetlands along the landside toe of the levee, and 8 acres of non-wet wooded area along a tree line at the toe of the levee. Compensatory mitigation requirements entail restoration of 27 acres of forested BLH wetlands (11 acres due to wetland impacts and 16 acres due to non-wet tree clearing).

The Phillipy Project is expected to impact a total of approximately 3.15 acres of forested wetlands within a Wetland Reserve Program (WRP) and 1.85 acres of farmed wetland. Compensatory mitigation requirements entail restoration of 1.85 acres of forested BLH wetlands. The 3.15 acres of impacts to the WRP site would be mitigated on-site and coordinated with the Natural Resources Conservation Service (NRCS).

Planned actions include planting bottomland hardwood species within tracts of cleared agricultural land. The mitigation site is located in Dyer County, Tennessee as the USACE is acquiring 4 tracts of land totaling approximately 70 acres (Figure 1) to mitigate for the unavoidable impacts that would be incurred due to these as well as potential future MRL project actions. The Tennessee Department of Environment and Conservation (TDEC) and the Tennessee Wildlife Resources Agency (TWRA) met on-site to visit the sites, and this detailed, site-specific mitigation plan will be coordinated with the interagency team (IAT) to include TWRA, TDEC and the U.S. Fish and Wildlife Service. Compensatory mitigation would occur prior to or concurrent with construction of the proposed project.

This document has been developed to meet all requirements stated in the joint U.S. Army Corps of Engineers (USACE)/EPA Compensatory Mitigation for Losses of Aquatic Resources Rule (33 CFR 332.4(c) [40 CFR 230.94(c)]) and to take field observations and new information into consideration. Under this rule, mitigation plans for all wetland compensatory mitigation projects shall contain the following twelve elements: (1) objectives; (2) site selection criteria; (3) site protection instruments (e.g., conservation easements); (4) baseline information (for impact and compensation sites); (5) credit determination methodology; (6) mitigation work plan; (7) maintenance plan; (8) ecological performance

standards; (9) monitoring requirements; (10) long-term management plan; (11) adaptive management plan, and (12) financial assurances.



Figure 1. Aerial photograph showing four tracts of land, totaling approximately 70 acres in Dyer County, Tennessee, that are currently in the process of acquisition for the purpose of compensatory mitigation. The compensatory mitigation is required for the Mississippi River Levees Project.

Mitigation Objectives

USACE is required to restore jurisdictional wetland status to a total of 28.85 acres to compensate for unavoidable impacts to wetlands and associated habitat during the construction of the projects.

Restoration of wetland functions would improve habitat suitability for wildlife, especially species dependent upon seasonal wetlands for food, shelter, and/or reproductive purposes. In addition, the location of the mitigation sites would achieve reforestation of approximately 60 acres of land between the MRL and the forested wetland (previously used for borrow) area along the riverside of the levee providing flood storage, nutrient cycling, and an increased buffer between the highway and the existing wetlands.

Mitigation Site Selection Criteria

Criteria used to select the site were the presence of hydric soils, local topography, proximity to the impacted wetlands and BLH and location within the Mississippi River floodplain. These sites were identified by the local sponsor near the Miston project area in agricultural lands that are adjacent to the forested wetland/open water complex that is part of the same system that would be impacted by the proposed project. As noted above, the IAT approved the sites during a site visit; representatives of USFWS unable to attend.

Site Protection

The mitigation site would be posted and protected in perpetuity and remain in the ownership of the U.S. Government; however, a licensing outgrant is possible for land managing agencies such as the TWRA or other conservation entity. The boundary of the property would be clearly marked and posted by USACE with appropriate signs. See the Long Term Management Plan found on page 8 of this document for details.

Baseline Information

Impact Sites:

Two separate project areas are expected to be impacted by the proposed actions (described above, as well as in the referenced environmental assessments). For the Miston Project, a total of approximately 3.3 acres of forested wetlands, 0.85 acres of farmed wetland, 0.14 acres of mowed/maintained wetlands along the landside toe of the levee, and 8 acres of non-wet wooded area along tree lines would be impacted by the proposed project. Compensatory mitigation requirements entail restoration of 27 acres of forested BLH wetlands (11 acres due to wetland impacts and 16 acres due to non-wet tree clearing).

For the Phillipy Project, a total of approximately 3.15 acres of forested wetlands within a Wetland Reserve Program (WRP) and 1.85 acres of farmed wetland would be impacted by the proposed project. Compensatory mitigation requirements entail restoration of 1.85 acres of forested BLH wetlands. The 3.15 acres of impacts to the WRP site would be mitigated on-site and coordinated with the NRCS. Compensatory mitigation requirements entail restoration of 1.85 acres of forested BLH wetlands. With time, it is expected that the proposed borrow pit would resemble the existing adjacent borrow pit, effectively enlarging the areal extent of the open water/wetland complex.

Compensatory Mitigation Site:

The compensatory mitigation tracts that are being acquired total approximately 70 acres (approximately 60 acres are restorable, the remaining acreage is already forested), in close proximity to land owned by the State of Tennessee for conservation/wildlife purposes. The land is currently in agricultural production on the riverside of the MRL near Midway, Dyer County, Tennessee (Figure 1). Tract 1, includes the farmed areas on the north side of Bradley Road and totals approximately 14 acres (Figure 2). Tract 2 is located immediately south of Bradley Road and extends to Poorway Road, totaling approximately 32 acres of farmland (Figure 3). Tract 3 begins at Poorway Road extending south, and totals approximately 8.4 acres of farmland (Figure 4). Tract 4 begins at Moss Island Road and extends south totaling approximately 16.5 acres (Figure 5). These tracts extend for approximately 5.3 miles along the Highway 181/Great River Road, and have a width that varies between 50 and 300 feet. This land would provide a buffer and flood storage between the MRL and the forested wetland/open water complex that provides drainage to the area.

The hydrology of the local area has been modified by the construction of the Dyer County Little Levee and the MRL as well as agricultural drainages. The area is subject to high-water events from Obion River backwater and the forested wetland/open water complex adjacent to the site is the primary drainage pathway for the area protected from high water by the levees.

Due to the presence of the MRL and the Dyer County Little Levee water must flow south along the MRL. The water travels through drainage pathways, streams and wetlands before emptying into the Obion River via culverts. During periods of heavy rain and/or high water levels on the Mississippi/Obion River the mitigation site would be saturated or inundated for the required 15 consecutive days annually.

The soils on these sites have likely been altered by the creation of the MRL. Two soil types dominate the area near the mitigation site. Commerce silty clay loam and Bowdre Clay comprise approximately 55% and 45% of the surrounding area respectively (Brown *et al.* 1965).

Cultural Resources:

No known cultural sites have been identified within the mitigation areas. A cultural resources survey will be completed when the land is purchased. In the event cultural materials are encountered during mitigation activities, all work would be halted. Memphis District archaeologists and the Tennessee State Historic Preservation Office (SHPO) would be notified as soon as possible to determine the appropriate course of action.

Credit Determination Methodology

USACE Regulatory and Environmental Compliance Branch personnel determined a compensatory mitigation ratio based on previous projects similar to the proposed actions and available habitat.

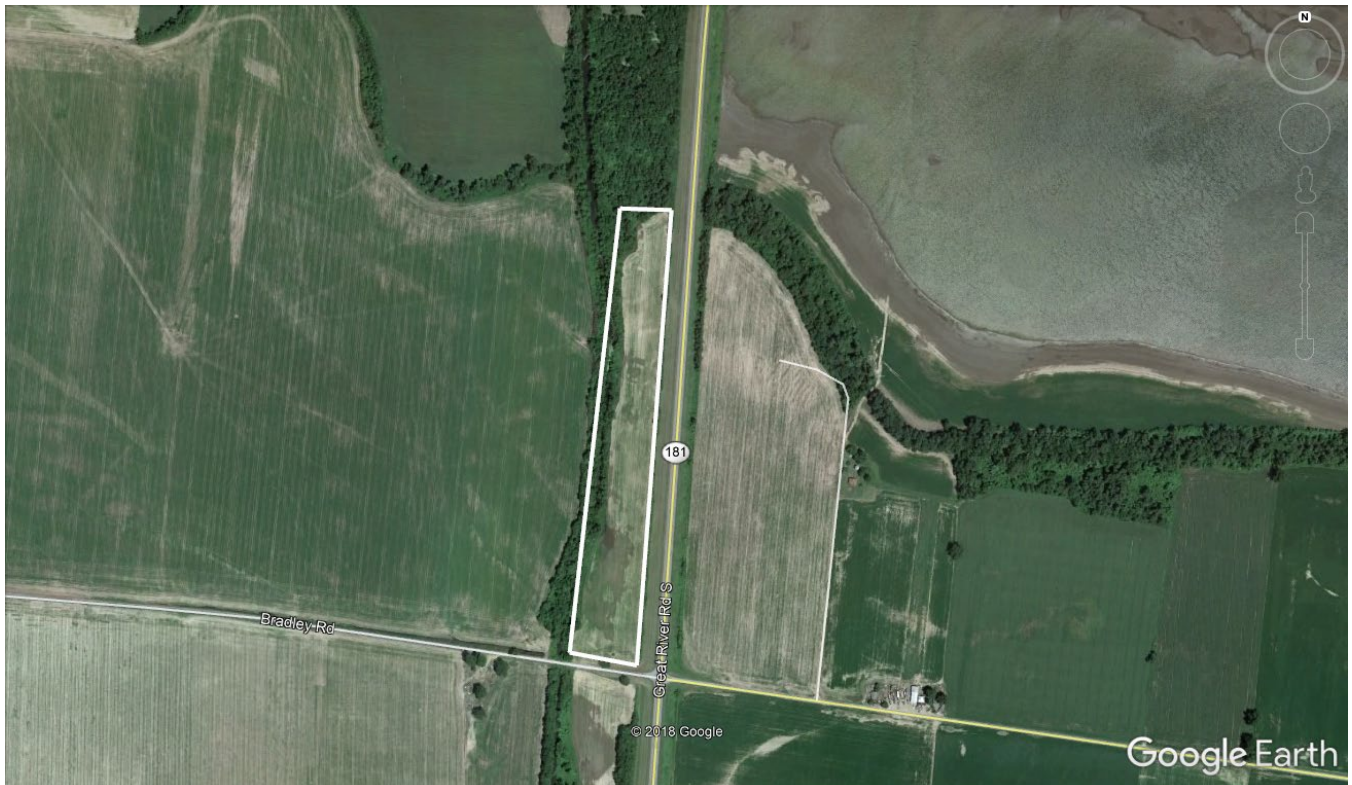


Figure 2. Aerial photograph showing Tract 1, totaling approximately 13.6 acres in Dyer County, Tennessee. The compensatory mitigation is required for the Mississippi River Levees Project.



Figure 3. Aerial photograph showing Tract 2, totaling approximately 31.8 acres in Dyer County, Tennessee. The compensatory mitigation is required for the Mississippi River Levees Project.

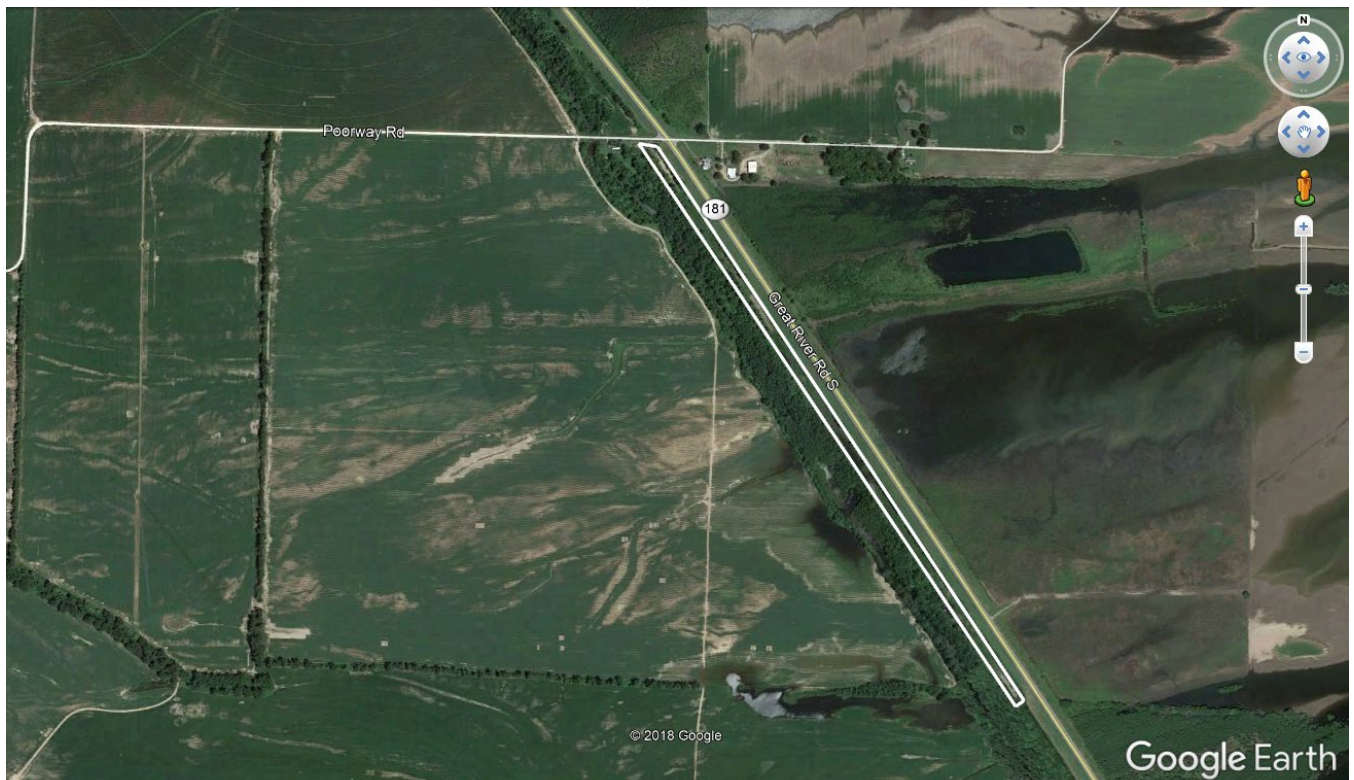


Figure 4. Aerial photograph showing Tract 3, totaling approximately 8.4 acres in Dyer County, Tennessee. The compensatory mitigation is required for the Mississippi River Levees Project.

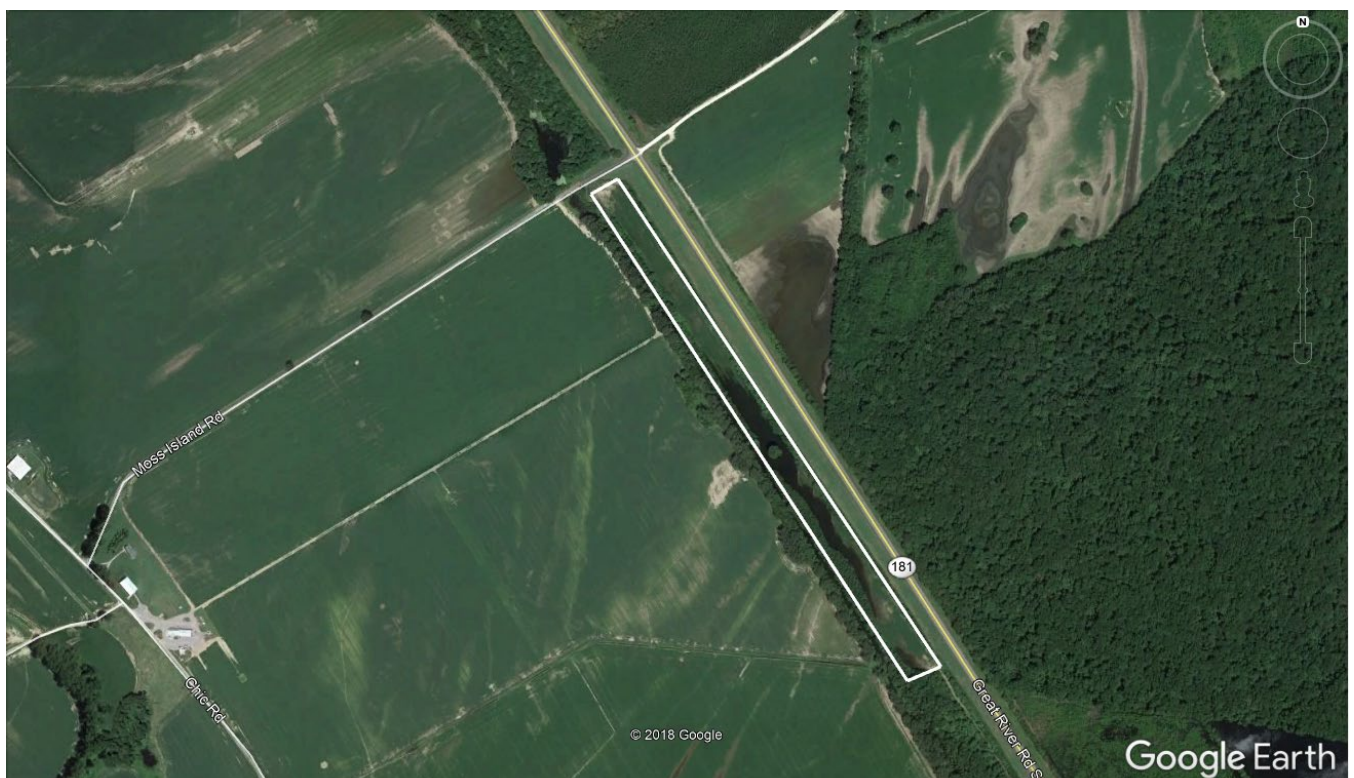


Figure 5. Aerial photograph showing Tract 4, totaling approximately 16.5 acres in Dyer County, Tennessee. The compensatory mitigation is required for the Mississippi River Levees Project.

Mitigation Work Plan

The mitigation site will remain in agricultural production until the mitigation plan is approved and the site is acquired and restoration begins. Restoration is expected to begin in early spring 2021.

Bottomland Hardwood Plantings

Tree planting would likely be conducted in the dormant season during early spring of 2021. During portions of the growing season, anticipated water depths on this site are expected to fluctuate significantly at the compensatory mitigation sites. Depending on precipitation rates, duration of flooding may range from a few days to several weeks with soil saturation persisting for a period greater than 14 days during the growing season. Bottomland hardwood seedlings would be planted in rows on 10-foot centers at a density of 436 seedlings/acre at the mitigation site. Tree species that would be planted consist of flood tolerant species which may include but are not limited to swamp white oak (*Quercus bicolor*), Nuttall oak (*Quercus nuttallii*), overcup oak (*Quercus lyrata*), pin oak (*Quercus palustris*), water hickory (*Carya aquatica*), shellbark hickory (*Carya laciniata*), shagbark hickory (*Carya ovata*), pecan (*Carya illinoensis*), American elm (*Ulmus americana*), and persimmon (*Diospyros virginiana*). The sites would be planted with 50% hard mast species with no species comprising more than 30% of the planted trees.

Maintenance Plan

The site would be maintained in a mowed or tilled state until it is planted in trees. Other vegetation would be allowed to establish voluntarily after completion of tree planting. If undesirable or invasive species are observed, spraying or hand-pulling will be utilized to prevent establishment. Annual monitoring of the mitigation sites will be conducted by USACE biologists with optional participation from TWRA, TDEC and/or USFWS. Sign posting, and restrictions on use of the property such as no permanent buildings, no tree cutting, no mowing and no use of ATV's would occur once land is acquired and restored.

Ecological Performance Standards

Wetland mitigation:

Vegetation: At least 70% of the trees planted must have survived at the end of five years. Hydrophytic vegetation must also be present on the site at the end of the five year monitoring period.

Soil: Hydric soil must be present on the site at the end of the five year monitoring period.

Hydrology: Property must be inundated or have a shallow water table (within 12 inches of surface) for at least fourteen consecutive days during the growing season (26 March-7 November).

Habitat suitability: Populations of wildlife would increasingly utilize the tract of land for food, shelter, and/or reproductive purposes as the habitat becomes more stable and wetland functions return and increase. The location of the mitigation site on farmed wetland and near existing wetlands increases the utility of the tract for wildlife. The location and proximity to the existing forested wetland corridor at the riverside toe of the mainline levee makes the tract conducive for use as a wildlife corridor and highly accessible to wildlife utilizing these areas.

Monitoring Requirements

The presence or absence of jurisdictional wetland indicators would be assessed using the procedures outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (2010) hereafter referred to as the Supplemental Manual. A mitigation site monitoring event would be performed by USACE biologists at least once during each growing season (26 March-3 November). Annual monitoring events would continue for five years, or until mitigation is deemed successful by the IAT. The monitoring would be performed on a minimum of two permanent plots within each tract, each having a 30-foot radius as suggested by the Supplemental Manual. The plots would be positioned equidistant from the edges of the site and each other as possible. Additionally, monitoring of the mitigation tract would include site visits each year to observe the progress of the mitigation and the condition of the property.

Vegetation:

Wetland delineations would follow the sequence suggested by the Supplemental Manual when applying the hydrophytic vegetation indicators: Indicator 1- Rapid Test for Hydrophytic Vegetation, Indicator 2- Dominance Test, and finally Indicator 3-Prevalence Index. If the plant community passes the Rapid Test for Hydrophytic Vegetation, the vegetation is hydrophytic and no further analysis is needed. If that indicator is not satisfied, the Dominance Test (Indicator 2) must be applied. If the plant community passes the Dominance Test, the vegetation is hydrophytic and no further analysis is needed. If that indicator is not satisfied, the Prevalence Test (Indicator 3) must be applied. If the plant community passes the Prevalence Test, the vegetation is hydrophytic and no further analysis is needed. If none of the indicators are satisfied, hydrophytic vegetation would not be considered to have been restored (USACE 2010). If hydrophytic vegetation is found to be absent, plans would be formulated by the IAT to assess the reasons for nonsuccess as well as possible solutions to the proposed issues.

The plots located within the site would be used to monitor the vegetation present and the percentage of species that compose the vegetation on the tract. In addition to these characteristics, growth rates and the survival percentage of planted trees would be assessed. The plots would also be used as permanent photo stations to visually document the development of the wetland during the monitoring period.

Soil:

The presence or absence of hydric soil indicators would be assessed using the procedures for wetland delineation outlined in the Supplemental Manual. When examining soil conditions the recommended excavation depth for most soils is approximately 20 inches; however a shallower pit may suffice for some indicators. If one or more hydric soil indicator(s) is met, the soil would be determined to be hydric (USACE 2010). If indicators for hydric soil are found to be absent, plans would be formulated to assess the reasons for nonsuccess as well as possible solutions to the proposed issues.

Hydrology:

There are four groups of wetland hydrology indicators discussed in the Supplemental Manual. Indicators in Group A are based on direct observations of surface water or ground water during a site visit. Group B indicators consist of evidence that the site is subject to flooding, though the site is not currently inundated. Group C consists of other evidence that the site has soil that is or has recently been saturated. Group D indicators include landscape, vegetation, and soil features that suggest contemporary

rather than historical wet conditions on the site. Each group discussed is divided into two groups, primary and secondary, based on reliability. One primary indicator from any group is sufficient to conclude that wetland hydrology is present. If no primary indicators are observed, two or more secondary indicators from any group are required to conclude that wetland hydrology is present (USACE 2010). If the conditions are observed to conclude wetland hydrology is present, the mandatory fourteen consecutive day period of inundation or shallow water table would be assumed to have been met. If indicators for wetland hydrology are found to be absent, plans would be formulated to assess the reasons for nonsuccess as well as possible solutions to the proposed issues.

Habitat suitability:

Evidence of living aquatic fauna and non-living remains of aquatic fauna would be documented and photographed in each trip report. Any direct observations of wildlife usage would be noted and photographed. General observations of evidence of wildlife usage including scat, used food sources, remnants of hatched eggs, etc. would also be noted in each trip report.

Monitoring Reports

After each annual assessment of the mitigation sites, a final findings report would be provided to the interagency team and other concerned parties for the duration of USACE monitoring of the property.

Long Term Management

Mitigation lands will be held and protected in perpetuity by the Government of the United States. The USACE may enter into a long-term management agreement with a state or federal land management agency as appropriate. Long term management would include an operation/management plan to ensure that the tract continues to function as intended and is protected.

Adaptive Management

Flexibility would be retained in the management of the mitigation tract that would provide options to maximize benefits to all fish and wildlife resources. Adaptive management decisions would be based upon monitoring results with input from the IAT. Additionally, overall project mitigation may be adjusted in the event that the mitigation tract is not functioning as intended. Examples of adaptive management may include, but are not limited to replanting trees or planting different types of vegetation, and implementing methods to enhance and restore hydrology.

Financial Assurances

Sufficient Federal appropriations will be provided to the project to successfully construct and monitor the project mitigation site and to accomplish minor corrective actions, if deemed necessary during the monitoring period. In the event of a total mitigation failure or if major corrective action is required and funds are no longer available, the project would require modification.

Agency Review

This mitigation plan will undergo agency review for comments and suggestions. A copy will be sent to the following agencies.

U.S. Fish and Wildlife Service
Tennessee Wildlife Resources Agency
Tennessee Department of Environment and Conservation

Literature Cited

Brown. W. T., W. C. Moffitt, C. L. Moore, W. C. Jackson. 1965. Soil Survey of Dyer County, Tennessee. Soil Conservation Service. United States Department of Agriculture in cooperation with the Tennessee Agricultural Experiment Station. 84pp.

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Environmental Protection Agency. (2008). *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule*.