

CEMVR-PM-A

APPENDIX A-4

**CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION**

**PEORIA RIVERFRONT DEVELOPMENT
(ECOSYSTEM RESTORATION) STUDY, ILLINOIS**

MAY 2002

**PEORIA RIVERFRONT DEVELOPMENT
(ECOSYSTEM RESTORATION) STUDY, ILLINOIS
FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

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SECTION 1 - PROJECT DESCRIPTION

LOCATION

The proposed project is dredging to create deepwater aquatic habitat with island construction in Peoria Lake and create wetland habitat in the Farm Creek watershed. Peoria Lake is located at the City of Peoria, Illinois, on the Illinois Waterway. The Peoria Lake project is located in the upper east quadrant of Lower Peoria Lake in the vicinity of the McCluggage Bridge (U.S. Routes 24 and 150). The Farm Creek project is located in a farm field east of Washington, Illinois.

AUTHORITY AND PURPOSE

Specific authority for conducting the Peoria Riverfront Development study is contained in Resolution 2500 of the Committee on Transportation and Infrastructure, adopted May 9, 1996. Additional authority for conducting this investigation is contained in Section 216 of the 1970 Flood Control Act, which authorizes the U.S. Army Corps of Engineers to make modifications to completed projects, i.e., the 9-foot channel navigation project on the Illinois River, and Section 519 of the Water Resources Development Act (WRDA) 2000, which authorized restoration of the Illinois River Basin.

The purpose of the evaluation portion of this document is to comply with Section 404 of the Clean Water Act pertaining to guidelines for the placement of dredged material into waters of the United States. This evaluation, in conjunction with the *Peoria Riverfront Development (Ecosystem Restoration) Study, Illinois, Feasibility Report with Integrated Environmental Assessment*, will assist in analysis of alternatives for the proposed project, resulting in a designated Base Plan. Further, this evaluation will provide information and data to the state water quality certifying agency demonstrating compliance with state water quality standards.

GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL

The Rock Island District's Geotechnical Branch staff took borings from the lake bottom in June/July of 2001. The clay/silt passing the No. 200 sieve for all samples from borings taken in sediment to depths of 25 feet was 89%. This shows the material to be clay sediment with almost no sand. If material with higher sand content were required for construction of the islands, that borrow material would be taken from the lakebed below the water line where nearby deltas are forming within the lake.

The Tazewell County, Illinois soil survey shows the farm field site to contain Ipava silt loam, Tama silt loam, Sable silty clay loam, Birkbeck silt loam and Birkbeck silty clay loam.

DESCRIPTION OF PROPOSED DISCHARGE SITES

The proposed project would use material dredged from the bottom of Peoria Lake for construction of islands within the upper east quadrant of the lake itself and outside of the main navigation channel. The area of placement has a water depth of 1-2 feet with a substrate of unconsolidated sediment that has been described as “pudding.” This material is kept in suspension from wave action over the broad expanse of the shallow part of the lake.

The largest construction effort would be for a total of three islands. One smaller island constructed above the bridge at approximate Illinois Waterway River Mile (RM) 166.0 and two larger, parallel islands constructed below the bridge near the Avery Light and Daymark at RM 165.3.

The smaller island above the bridge would be approximately 2,210 feet long and 485 feet wide, creating approximately 44 acres of terrestrial habitat. The dredging would create deepwater channels around the island and a 36-acre protected backwater off the main channel behind the island (see plate 3). Approximately 2,500 feet of riprap (approximately 11,500 tons) would be placed as shoreline protection at the upper end and along the channel side of the island. Eighteen rock jetties, approximately 8 feet wide by 20 feet long and placed approximately 250 feet apart (approximately 610 tons of riprap), would be placed as additional fish structure. One offset rock jetty (one-half from the mainland and one-half from the island) approximately 450 feet long (approximately 3,200 tons of riprap) would be placed at the upper end of the island to help reduce sediment from moving into the backwater area. The rock tie-in would be placed on the mainland shoreline for a length of approximately 25 feet and would be at (or below) the ordinary high water line and would also be placed below any shoreline vegetation.

The pair of islands below the bridge would be built in the same area as the Avery Light and Daymark. This would require relocation of the light and daymark to a new location, probably on the west (channel) side of the newly constructed island pair.

The east island would be approximately 3,960 feet long and 475 feet wide, creating approximately 76 acres of terrestrial habitat. The west island would be approximately 3,775 feet long and 235 feet wide, creating approximately 36 acres of terrestrial habitat. The dredging would create deepwater channels around the islands and a 56-acre protected backwater off the main channel between and behind the island pair (see plate 4). Approximately 7,200 feet of riprap (approximately 34,100 tons) would be placed as shoreline protection at the upper and lower ends of each island. Sixty-eight rock jetties, approximately 8 feet wide by 20 feet long (approximately 2,200 CY of riprap) and placed approximately 250 feet apart, would be placed as additional fish structure along the length of the islands. A rock closing structure approximately 500 feet long (approximately 1,900 CY of riprap) would be placed at the upper end of the east island to the mainland shoreline to help reduce sedimentation. The rock tie-in placed on the mainland shoreline for a length of approximately 25 feet would be at (or below) the ordinary high water line and would also be placed below any shoreline vegetation.

The field site east of the City of Washington, Illinois is in the upper watershed of Farm Creek. While the field site is generally dry and there are no wetlands located there, USGS maps show that the drainage ways within the field are considered waters of the US. Our project proposes to construct berms using material from the field to provide wetland habitat using the run off water that would normally pass through the field. The project also proposes to plant a variety of native wetland and prairie plant species to enhance habitat on the site.

DESCRIPTION OF PLACEMENT METHOD

The islands in Peoria Lake would be constructed using a floating plant with large capacity clamshell bucket and/or a hydraulic dredge. The mechanical dredge would remove adjacent soft lake bottom sediment and place the material nearby to form an embankment, which would be filled by hydraulic dredge. Hydraulic dredging utilizes a cutterhead in combination with a centrifugal pump to entrain dredged solid materials in high velocity water where the material can then be pumped through pipes and placed where needed.

The general scenario for construction of the islands would be to first construct sediment confinement structures. The sediment confinement structures would be built by placing mechanically dredged fine sediments to form a confinement embankment. After construction of the sediment confinement structures, fine sediments would be hydraulically dredged into the confinement structures to form the islands. Detailed drawings of all sediment confinement options are found in the main report.

Project construction is proposed to be done in stages to allow time for dredged material consolidation. Riprap for all the project features would be placed from a barge with a clamshell, or boulders would be pushed off the barges using an endloader.

Construction of the berms in the farm field would be done using standard earth moving equipment.

SECTION 2 - FACTUAL DETERMINATIONS

PHYSICAL SUBSTRATE DETERMINATIONS

a. Substrate Elevation and Slope. Normal pool elevation for Peoria lake is 440.0 feet National Geodetic Vertical Datum (NGVD). The islands are proposed to be constructed to an elevation of 450.0 feet NGVD. The bottom of the lake is at approximately 438 feet NGVD. The elevation of the farm field is approximately 750 feet NGVD, which is approximately 10 feet above farm creek.

b. Sediment Type. Dredging and placement in Peoria Lake to construct the project would disturb extremely fine unconsolidated bottom sediments that are kept in suspension by wave action on the lake. Personnel from the Rock Island District's Geotechnical Branch performed subsurface exploration during three different time periods as the project feature scope evolved. Six offshore borings were taken in July 2000, three offshore borings were taken in March 2001, and seven hand auger borings were taken on two separate days in May 2001. Sediment borings taken in Peoria Lake at or near the proposed island construction sites indicate an average surface elevation of 438.0 IL State Plane Coordinate System (NAD 83). The upper 25 feet of sediment generally consists of soft clayey silts and silty clays.

More detailed information can be found in Appendix C, Geotechnical Considerations.

The material found in the farm field is generally silty clay loam.

c. Dredged/Fill Material Movement. Use of the clamshell dredge to form the island perimeter would limit the movement of the dredged material and would act as a berm to help confine the placement of the hydraulically dredged material.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

d. Physical Effects on Benthos. Dredging and island construction would temporarily disrupt the aquatic environment. However, the benefits gained from improved aquatic habitat and water quality would far out weigh any loss during that time.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

e. Actions Taken to Minimize Impacts. During the initial stages of island construction, mechanical dredging would be utilized to reduce water quality impacts. Early construction of the island perimeter ring structures would minimize impacts from hydraulic placement for later phases of island construction by acting as berms to hold the dredged material at the interior of the island. The excavated material would be allowed to consolidate and form a crust between passes of the floating plant to improve the overall stability of the island.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

a. Water. Water quality conditions throughout Peoria Lake are dominated by the shallow nature of the lake and the soft unconsolidated sediments found throughout the lake. The majority of the lake's water quality problems are related to high turbidity values and suspended solids concentrations. These elevated values are a result of agricultural non-point runoff and re-suspension of sediments due to wave action from wind and barge traffic. A secondary impact of high turbidity values and soft unconsolidated sediments is the virtual absence of rooted aquatic plants throughout the lake.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

b. Current Patterns and Circulation. Only minor changes in current patterns or flows would result from construction of the islands.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

c. Normal Water Level Fluctuations. The Illinois River is typified by wide fluctuations in water levels during flood events. A model of the Illinois River was run using the UNET program to obtain the peak water surface profile for the Illinois River for various frequency events. The data generated by the model showed that the addition of the islands would have minimal effect on the water surface elevation of the Illinois River. (Complete details of this information can be found in Appendix D.)

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

d. Salinity Gradients. The proposed action would take place in and around an inland freshwater stream system. Therefore, no consideration of salinity gradients is warranted for these actions.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

e. Actions Taken to Minimize Impacts. During the initial stages of island construction, mechanical dredging would be utilized to reduce water quality impacts by confining the dredged material. Early construction of the island perimeter ring structures would minimize impacts from hydraulic placement for later phases of island construction by acting as berms to hold the dredged material at the interior of the island. The excavated material would be allowed to consolidate and form a crust between passes of the floating plant to improve the overall stability of the island.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

a. **Effects on Physical and Chemical Properties of the Water Column.** Use of mechanical dredging to contain hydraulically dredged material to act as berms eliminates most impacts to the water column.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

b. **Effects on Biota.** The aquatic biota of Peoria Lake is marginal at best. Impacts from the project would virtually wipe out what little there is. However, the advantages to be gained by the improved habitat after project completion far outweigh any disadvantages occurring during project construction.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

c. **Actions Taken to Minimize Impacts.** Several measures to minimize the impacts of the project features will be implemented in the design, and during and after construction. The configuration of the island is designed with shallow slopes to minimize erosional impacts from wind and wave action. The excavated material would be allowed to consolidate and form a crust between passes of the floating plant to improve the overall stability of the island. After island construction is completed, riprap would be placed to further reduce any erosion. It is also expected that the islands will become vegetated by the seed bank contained in the lake bottom that was used to construct the island.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

CONTAMINANT DETERMINATIONS

Sediment cores of varying lengths were collected and analyzed for a variety of chemicals in the project area during 1999 and 2000. Sediment removed from the project area as part of a separate access channel dredging project was also analyzed after spending 9 months weathering in a gravel pit. The results are reported in *Assessment of Sediment Quality for the Peoria Riverfront Environmental Restoration Project*, dated June 29, 2001, by the Illinois State Geological Survey (see Appendix E-3). Several laboratories analyzed the various samples and in most cases the lab results were in agreement. A University of Illinois researcher conducted an agronomic evaluation of the sediment. The results are reported in *Sediments and Sediment Derived Soils in Illinois: Pedological and Agronomic Evaluation and Characterization*.

There is no general regulatory standard applicable to the chemical quality of river sediments. There are some guidelines for determining when contaminants are elevated. Some standards exist for purposes such as cleanup, to protect human health at former industrial sites. Background levels for some chemicals in typical Illinois soils are also known.

Overall sediment quality in the project area is good. PCBs and all but one chlorinated pesticide were not detected. The presence of that chlorinated pesticide, MCP, was not confirmed by

subsequent testing. Metals of regulatory concern, such as chromium, copper, mercury, and zinc, were above background soil levels but below the levels required for cleanup at industrial sites. Heavy metals were below the U.S. EPA regulatory limits for application of sewage biosolids to farmland. Levels of compounds in the PAH group varied between laboratories, but in most cases were below screening values and levels of concern.

Sediment and soil derived from sediment from several central Illinois reservoirs and Lake Peoria were evaluated to determine their potential value for use as soil or a soil amendment. The sediments are generally rich in plant nutrients and could potentially make good agricultural soil. The sediments tend to be fine textured, with silt and clay-sized particles dominating. The physical characteristics of the evaluated dredged sediments were similar to naturally productive agricultural soils in Illinois. Water stable aggregation data indicated the sediments have potential to develop good, stable soil structure after weathering by freezing, thawing, wetting, and drying. There is no indication in the physical data that these sediments should present a problem for agricultural utilization given proper handling, tillage, and fertility treatments. The pH of the Lake Peoria samples was elevated. This would tend to bind metals, making them less available for uptake by plants. General vegetative cover on Illinois River islands indicates that the chemical quality of the soil is not inhibiting plant growth.

Construction of the berms in the terrestrial environment of the farm field would not remove any fill from the general environment that it is already in. Therefore the project is not anticipated to have any negative impacts to the aquatic environment.

AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

a. Effects on Plankton, Nekton, and Benthos. The project is anticipated to improve the quality of the aquatic habitat in Peoria Lake.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

b. Effects on Aquatic Food Web. Dredging to provide deepwater and overwintering aquatic habitat would improve the overall health and food web of the lake. Fisheries would increase as well as benthic organisms as water quality and habitat diversity are improved by the project.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

c. Effects on Special Aquatic Sites. Effects on special aquatic sites, such as mussel beds and/or fish spawning habitat located in the vicinity, would be improved. No mudflats, vegetated shallows, coral reefs, or riffle and pool complexes would be affected by the proposed actions.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

d. Threatened and Endangered Species. There would be no impacts to threatened and/or endangered species in the project area.

e. **Other Wildlife.** Other fish and wildlife associated with the aquatic ecosystem are expected to be positively impacted by increased habitat benefits as a result of this project.

f. **Actions Taken to Minimize Impacts.** Early and open coordination with state and Federal resource agencies helps to minimize potential adverse impacts to aquatic, wetland, and terrestrial ecosystems.

PROPOSED PLACEMENT SITE DETERMINATIONS

a. **Mixing Zone Determinations.** A mixing zone is that volume of water at a placement site or discharge site required to dilute contaminant concentrations associated with a discharge of dredged material to an acceptable level. Since the mechanically dredged material would mostly confine the hydraulically dredged material, no violation of any standard would result during placement of dredged material.

Construction of the berms in the terrestrial environment of the farm field is not anticipated to have any negative impacts to the aquatic environment.

b. **Determination of Compliance with Applicable Water Quality Standards.** This Clean Water Act Section 404(b)(1) provides the necessary compliance required by law. Section 401 Water Quality certification in compliance with the Clean Water Act, and all other permits necessary for the completion of the project, would be obtained prior to project construction.

c. **Potential Effects on Human-Use Characteristics.** Implementation of the proposed project would have no effect on municipal or private water supplies; parks; national monuments or other similar preserves. The project is anticipated to improve commercial or recreational fishery in the lake area.

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

The project is designed for a minimum life of 25 years, and island construction within the lake using material dredged from the lake bottom is anticipated to produce improvements on the aquatic ecosystem over the life of the project. The project would improve long-term water quality within the lake by increasing deepwater habitat as well as improving fisheries within the lake. The project would provide overwintering areas for fisheries as well as spawning areas during its life. Additional recreational benefits would also be provided for boaters and fishermen. Improved habitat could potentially promote improved mussel resources for the area as well over the long term.

DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No adverse secondary effects on the aquatic ecosystem are anticipated. Improved water quality; as well as improved fisheries, waterfowl and mussel habitat; and the reduction of lake sediments are the goals of this ecosystem restoration project. Flood heights have been evaluated, and construction is designed to meet state requirements. This determination is subject to reevaluation, if warranted by Federal, state, or local agency comment, as well as input from the general public.

**SECTION 3 - FINDINGS OF COMPLIANCE OR NONCOMPLIANCE
WITH THE RESTRICTIONS ON DISCHARGE**

**PEORIA RIVERFRONT DEVELOPMENT
(ECOSYSTEM RESTORATION) STUDY, ILLINOIS**

1. No significant adaptations of the 404(b)(1) guidelines were made relative to this evaluation.
2. Evaluation of Practicable Alternatives. Refer to Section 2 - Plan Formulation of the main report.
 - a. **No Federal Action.** This alternative was not selected because sedimentation within Peoria Lake has reduced it to a state of deterioration that is currently unacceptable.
 - b. **Proposed Action.** The proposed action is considered environmentally and economically acceptable and operationally feasible as planned. The construction of islands using geotextile tubes and berms to contain dredged material from the lake bottom has been selected to reduce water quality impacts as well as impacts to the riverine system. Materials discharged would be contained and have been evaluated for chemical and physical properties and have been determined to be acceptable for the environment.
3. Section 401 certification of the Clean Water Act will be obtained prior to project implementation. The project will be in compliance with water quality requirements of the State of Illinois.
4. The project is not anticipated to induce toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.
5. No adverse impact to Federal or state-listed endangered species would result from the proposed actions. No marine sanctuaries would be impacted.
6. No municipal or private water supplies would be affected by the proposed actions, and no degradation of waters of the United States is anticipated.
7. Removal of sediments to construct islands and deepwater channels as well as shallow water areas would provide improved water quality and habitat diversity to Peoria Lake and is deemed beneficial for the environment.
8. No other practical alternatives have been identified. The proposed actions are in compliance with Section 404(b)(1) of the Clean Water Act, as amended. The proposed actions would not adversely impact water quality and would improve habitat diversity in Peoria Lake.

Date

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