UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA HABITAT REHABILITATION AND ENHANCEMENT PROJECT

MARCH 2011

US Army Corps of Engineers ®
Rock Island District

LAGRANGE POOL
ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
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ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

The 6,800-acre Rice Lake Habitat Rehabilitation and Enhancement Project (HREP) lies on the right descending bank of the Illinois Waterway (IWW) between river miles (RM) 132.0 and 138.0, near Banner, Illinois. The Project is located in Fulton County, Illinois, approximately 24 miles southwest of Peoria, Illinois. The Project area encompasses the land and water areas that comprise the Rice Lake State Fish and Wildlife Area (SFWA).

The IWW is a large part of the Upper Mississippi River System (UMRS), which represents the largest riverine ecosystem in North America and the third largest in the world. This significant resource encompasses over 2.6 million acres of aquatic, wetland, forest, grassland, and agricultural habitats, supporting more than 300 species of birds; 57 species of mammals; 45 species of amphibians and reptiles; 150 species of fish; and nearly 50 species of mussels. More than 40 percent of North America's migratory waterfowl and shorebirds depend on the food resources and other life requisites (shelter, nesting habitats, etc.) that the UMRS provides. The importance of these resources was recognized by Congress in the Water Resources Development Act of 1986 by its declaration of the UMRS as a "nationally significant ecosystem," as noted in section 1, paragraph F. Institutional recognition of the significance of this resource was further recognized by Congress' initial and continued authorization of the Environmental Management Program (EMP) for the planning, construction, and evaluation of measures for rehabilitation and enhancement of fish and wildlife habitat in the UMRS.

The IWW historically functioned as a significant resting and foraging area for waterfowl during spring and fall migration. The shallow floodplain lakes provided abundant aquatic and emergent vegetation utilized as food and cover by diverse species of fish, water birds, and other animals. The wide floodplain also supported extensive bottomland forests with a substantial number of pin oaks, pecan, and hickories. This rich and diverse combination of food and cover supported large populations of waterfowl, fishes, and other wildlife. For these reasons, the IWW was once considered one of the most productive riverine systems for fish and wildlife in North America.

Over the past century, increased human activity within the IWW basin, floodplain, and channel has altered the hydrology, topography, and biotic communities originally present in the Project area. These alterations have reduced native plant and animal populations, degraded the quality of remaining natural resources and plant communities, impaired ecosystem functions, and threaten the future sustainability of the river-floodplain ecosystem.

The Rice Lake SFWA has been managed for migratory birds and other wetland dwelling species since the Illinois Department of Natural Resources (ILDNR) purchased tracts of land in the Project area during the 1940s, 1950s, 1980s, and 2000s. Site management by the state includes operation of pump stations and water control structures to provide reliable food production for migrating birds. The opportunity exists to increase overall preferred habitat quality and quantity by attenuating summer and fall flooding impacts, and by increasing native floodplain wet meadow and forest cover.

The goals of the proposed Project are to restore wetland, aquatic, and floodplain habitats. The following objectives have been identified to meet these goals:

- Increase the areal coverage as measured in acres of annual emergent and moist soil vegetation in Big Lake and Goose Lake during the summer growing season.
- Decrease summer water levels to below 440 in Big Lake, Goose Lake, and Rice Lake in order to promote vegetation growth during the summer growing season (Target is to achieve this condition 5 years of every 10);
- Increase connectivity between Big and Rice Lakes and the Illinois River during summer draw downs in order to reduce fish mortality and avian botulism;
- Increase year-round flowing side channel habitat areas within the Project area to provide habitat for fish and other aquatic species;

Four enhancement features and their associated construction options were considered to achieve the Project goals and objectives:

1. **Perimeter Water Control Spillway**
    - no action
    - construct a 24,050-foot perimeter spillway to a top elevation of 440 feet National Geodetic Vertical Datum (NGVD), a 2,500-foot armored spillway section, and install a gatewell structure

2. **Pump Station and Conveyance Channel**
    - no action
    - construct a pump station with a capacity of 50,000 gallons per minute (gpm) and a 4,000-foot discharge channel to manipulate Big Lake water levels
    - construct a pump station with a capacity of 133,200 gpm and a 7,000-foot discharge channel to optimize management and operational flexibility for the entire Project area

3. **Fish Egress Structures**
    - no action
    - install a fish egress structure between Rice Lake and the quarry on Duck Island to facilitate fish passage during drawdown conditions
    - install fish egress structures connecting Rice Lake to the quarry and Goose Lake to the IWW to facilitate fish passage during drawdown conditions

4. Mast-Tree and Native Wet Meadow/Grassland Plantings

- no action
- plant approximately 57 acres of mast-producing trees and 352 acres of native herbaceous plants on Duck Island's existing agricultural fields
- plant approximately 137 acres of mast-producing trees and 272 acres of native herbaceous plants on Duck Island's existing agricultural fields
- plant approximately 205 acres of mast-producing trees and 204 acres of native herbaceous plants on Duck Island's existing agricultural fields
- plant approximately 272 acres of mast-producing trees and 137 acres of native herbaceous plants on Duck Island's existing agricultural fields
- plant approximately 352 acres of mast-producing trees and 57 acres of native herbaceous plants on Duck Island's existing agricultural fields

Evaluation of the Project enhancement features and construction options was accomplished through application of the Wildlife Habitat Appraisal Guide (WHAG) and annualization of outputs and costs. The WHAG evaluation methodology quantifies habitat output in the form of habitat units that are used in conjunction with Project cost data and functional life expectancy to compare the construction options of the proposed enhancement features. This incremental analysis identifies which combination of enhancement features would be cost efficient and cost effective. The analysis also shows the changes in cost for increasing levels of environmental output.

The Recommended Plan (shown on figure ES-1) includes:

- constructing a perimeter water control spillway to elevation 440 feet NGVD and installing one gatewell structure (see paragraph A.2. on the previous page);
- providing water control capability by constructing a pump station with a capacity of 133,200 gpm and excavating a 7,000 foot discharge channel (see paragraph B.3. on the previous page);
- installing two reinforced concrete fish egress structures, one between Rice Lake and the quarry on Duck Island, and one between Goose Lake and the IWW (see paragraph C.3. on the previous page); and
- enhancing floodplain habitat by planting 352 acres of mast-producing native trees and 57 acres of native herbaceous plants on Duck Island (see paragraph D.6. on the previous page).

Construction of the perimeter water control spillway would protect interior areas from frequent IWW stage fluctuations during the critical growing season for moist-soil food plants. The armored spillway section would protect the perimeter water control spillway from erosion caused by overtopping and wind induced wave action. Constructing a pump station and discharge channel would allow water level manipulation (timely flooding) that is crucial to improving the success rate of submergent/emergent vegetation and their eventual use by migrating birds. The planting of native herbaceous vegetation- and mast-producing trees on Duck Island would restore historic floodplain cover type diversity and provide food and cover for resident and migratory birds and mammals. Installing a fish egress structure would create access to deep water refuge, therefore increasing the probability of survival for individual fish during the summer drawdown periods.

Implementation of the Recommended Plan would provide increased water management flexibility and the capability to optimize the quality and quantity of aquatic, wetland, and floodplain habitat at this location. The Project outputs meet ILDNR site management goals and objectives and support the overall goals and objectives of the UMRS-EMP; the North American Waterfowl Management Plan; and the Partners in Flight Program.

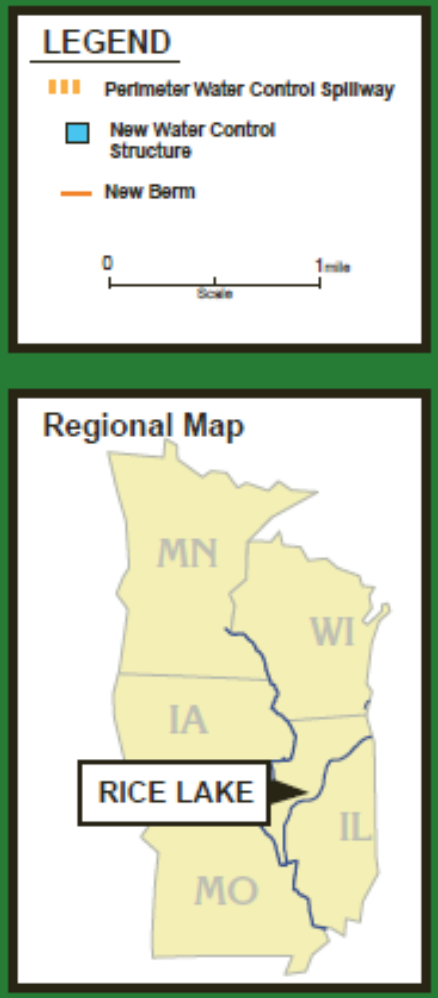
Per section 107(b) of the 1992 WRDA, the Project's Operation, Maintenance, Repair, Rehabilitation, and Replacement, at an estimated average annual cost of $39,400, would be accomplished by the ILDNR, the non-Federal Sponsor.

In accordance with the 1999 WRDA, a 35 percent non-Federal cost share will be required for general design and construction costs assessable to those Project features or portions thereof located on lands not "managed as a national wildlife refuge." All features identified for the Rice Lake HREP will require cost sharing. A Project Partnership Agreement will be executed consistent with this requirement.

The Corps, Rock Island District, District Engineer (DE), has reviewed the Project outputs, a gain of 12,499 average annual habitat units, and determined that the implementation of the selected plan is in the Federal interest. Therefore, the DE recommends construction approval for the Rice Lake HREP. The estimated total Project cost, including general design and construction management, is $18,469,000. The estimated total Federal cost is $12,005,000. The total non-Federal cost share is estimated at $6,464,000 and will be met by using land credits.

UMRS EMP

Figure ES-1
Rice Lake
Project Location Map



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1. INTRODUCTION

A. Location. The Rice Lake State Fish and Wildlife Area (SFWA) is a 6,800 acre wildlife management area located on the right descending bank of the Illinois Waterway's (IWW) LaGrange Pool, approximately 4 miles downstream of Banner, Illinois, between river miles (RM) 132.0 and 138.0. It is located in Fulton County, Illinois, approximately 24 miles southwest of Peoria, Illinois. The Rice Lake SFWA is managed by the Illinois Department of Natural Resources (ILDNR) to provide quality nesting and mid-migration habitat for migratory and resident waterfowl. The Project area is comprised of several backwater lakes, wet floodplain forests, and floodplain agricultural fields. The agricultural fields are located on a large tract of floodplain (Duck Island) that separates the two largest lakes, Rice Lake and Big Lake. Plate 1 provides vicinity and general location maps for the Rice Lake SFWA.

B. Purpose. The purpose of this report is to present a detailed proposal for the rehabilitation and enhancement of the Rice Lake SFWA Project area. This Definite Project Report (DPR) provides planning, engineering, and sufficient construction details of the Recommended Plan to allow final design and construction to proceed subsequent to approval of this document.

C. Resource Problems and Opportunities. The Rice Lake SFWA has historically been an excellent fisheries and mid-migration waterfowl habitat, but summer flood spikes and the loss of deep water habitat and mast trees has reduced the quality and quantity of habitat available to resident and migratory wildlife and fish species.

The summer flood spikes can kill the vegetation growth on low lying areas that then is unavailable to migratory waterfowl in the fall months. Sedimentation has resulted in the loss of deep water habitat used by fisheries for various life stage needs, including overwinter survival. Mast tree losses can be attributed to the magnitude and duration of the 1993 flood event, which has caused a change in species composition to less valuable species such as silver maple.

This report evaluates opportunities to restore habitat for resident and migratory birds, wildlife, and fish species in existing backwaters of the Rice Lake SFWA.

D. Project Selection. The ILDNR nominated the Rice Lake SFWA Habitat Rehabilitation and Enhancement Project (HREP) for inclusion in the Corps' Environmental Management Program (EMP).

The Fish and Wildlife Interagency Committee (FWIC) then ranked the Project habitat benefits based on critical habitat needs along the Mississippi River and the IWW. After considering resource needs and deficiencies pool by pool, the Rice Lake SFWA HREP was recommended and supported by the FWIC and the River Resources Coordinating Team as providing significant aquatic, wetland, and floodplain benefits with opportunities for habitat enhancement. Development of this report was actively coordinated with the ILDNR, the non-Federal Sponsor (NFS). Coordination occurred during on-site visits to the Project area, team meetings, and phone conversations (Appendix A, *Correspondence*).

E. Scope of Study. The scope of this study focuses on proposed Project features that would improve aquatic, wetland, and floodplain habitat and enhance overall resource values. The Project is consistent with agency management goals and was planned for the benefit of resident and migratory birds, fish, and other wildlife.

Field surveys, aerial photography, and habitat quantification procedures were completed to support the planning and assessment of proposed Project alternatives. Hydrographic soundings were performed in developing sedimentation rates and estimating excavation quantities. Soil borings were taken to determine sediment types and construction difficulty. Baseline water quality monitoring was performed to define present water quality conditions/problems.

The ILDNR has made wildlife and resident fish observations within the Project area. These observations, along with future studies and monitoring, will assist in evaluating Project performance.

F. Prior Reports and Existing Projects. The Corps and others have prepared numerous reports on the IWW and the Rice Lake area. The following reports contain the most relevant information for the current effort:

Illinois River Basin Restoration Comprehensive Plan with Integrated Environmental Assessment, March 2007. The draft Comprehensive Plan provides the overall plan for the restoration of the Illinois River Basin, including system needs and recommendations describing the restoration program, long term resource monitoring, computerized inventory and analysis system, and innovative dredging technologies and beneficial use of dredged material.

The fate of lakes in the Illinois River Valley. Illinois Natural History Survey. Biological Notes No. 119, 1983. This study examined historical accounts, old photographs, and maps prepared by J.W. Woermann between 1902 and 1904 for the Corps to develop a baseline condition of bottomland lakes and adjacent floodplain areas of the Illinois River Valley. The study compared this baseline to current conditions and developed projections for future conditions of Illinois River lakes and floodplains into the 21st century.

Big Lake Development Water Level Control Study, Rice Lake State Conservation Area. Report prepared for State of Illinois Capitol Development Board, Illinois Department of Conservation, 1991. This report, prepared for the ILDNR (then the Illinois Department of Conservation) by Crawford, Murphy & Tilly, Inc., Consulting Engineers, described and evaluated plans for water level control at the Rice Lake SFWA that featured development of water control capabilities for the (then) newly acquired Big Lake property as well as improvement of the reliability of water level control over the entire conservation area.

Upper Mississippi River System-Environmental Management Program, Banner Marsh State Fish and Wildlife Area, Habitat Rehabilitation and Enhancement Project. U.S. Army Corps of Engineers, Rock Island District, September 1995. This EMP HREP is located directly upstream of the Project area. The report recommended approval of the proposed project to include restoring the existing perimeter levee, constructing a pump station, grading littoral zone areas near existing water bodies, and planting warm season grasses.

Upper Mississippi River System-Environmental Management Program, Lake Chautauqua, Habitat Rehabilitation and Enhancement Project. U.S. Army Corps of Engineers, Rock Island District, June 1991. This EMP HREP is located 8 miles downstream of the Project area. The report recommended approval of the proposed project to include, restoring the existing perimeter levee, constructing a pump station and outlet structures, and excavating drainage channels and a side channel.

G. Authority. The UMRS - Environmental Management Program's (UMRS-EMP) original authorizing legislation was the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), Section 1103. The text of the authorization follows on page 4.

The EMP was originally comprised of five elements:

- Habitat Rehabilitation and Enhancement Projects (HREPs)
- Long-Term Resource Monitoring Program (LTRMP)
- Recreation Projects
- Economic Impacts of Recreation
- Navigation Monitoring

Currently, the EMP is comprised of two elements: 1) plan, construct, and evaluate measures for fish and wildlife habitat improvement through HREPs; and 2) monitor the natural resources of the river system through the LTRMP. The other EMP elements have either been successfully completed or are now carried out under other authorities.

The original authorizing legislation has been amended three times since its enactment. The 1990 WRDA, Section 405, extended the original EMP authorization an additional five years to fiscal year 2002, which allowed for ramping up of the program. The 1992 WRDA, Section 107, amended the original authorization by allowing limited flexibility in how funds are allocated between the habitat Projects program and the long-term resource monitoring program. The 1992 WRDA also assigned sole responsibility for Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R) of habitat projects to the agency that manages the lands on which the Project is located. The 1999 WRDA, Section 509, reauthorized the EMP as a continuing authority with reports to Congress every six years and changed the cost sharing percentage from 25 percent to 35 percent. The Rice Lake SFWA is located on state-owned land managed by the ILDNR and is subject to a 35 percent cost-sharing requirement.

Environmental Management Program Authorization

Section 1103 of the Water Resources Development Act of 1986 (P.L. 99-662) as amended by Section 405 of the Water Resources Development Act of 1990 (P.L. 101-640), Section 107 of the Water Resources Development Act of 1992 (P.L. 102-580), Section 509 of the Water Resources Development Act of 1999 (P.L. 106-53), and Section 2 of the Water Resources Development Technical Corrections of 1999 (P.L. 106-109).

WATER RESOURCES DEVELOPMENT ACT OF 1986
P.L. 99-662

SEC. 1103. UPPER MISSISSIPPI RIVER PLAN.

(a)(1) This section may be cited as the "Upper Mississippi River Management Act of 1986".

(2) To ensure the coordinated development and enhancement of the Upper Mississippi River system, it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system. Congress further recognizes that the system provides a diversity of opportunities and experiences. The system shall be administered and regulated in recognition of its several purposes.

(b) For purposes of this section --

(1) the terms "Upper Mississippi River system" and "system" mean those river reaches having commercial navigation channels on the Mississippi River main stem north of Cairo, Illinois; the Minnesota River, Minnesota; Black River, Wisconsin; Saint Croix River, Minnesota and Wisconsin; Illinois River and Waterway, Illinois; and Kaskaskia River, Illinois;

(2) the term "Master Plan" means the comprehensive master plan for the management of the Upper Mississippi River system, dated January 1, 1982, prepared by the Upper Mississippi River Basin Commission and submitted to Congress pursuant to Public Law 95-502;

(3) the term "GREAT I, GREAT II, and GRRM studies" means the studies entitled "GREAT Environmental Action Team--GREAT I--A Study of the Upper Mississippi River", dated September 1980, "GREAT River Environmental Action Team--GREAT II--A Study of the Upper Mississippi River", dated December 1980, and "GREAT River Resource Management Study", dated September 1982; and

(4) the term "Upper Mississippi River Basin Association" means an association of the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, formed for the purposes of cooperative effort and united assistance in the comprehensive planning for the use, protection, growth, and development of the Upper Mississippi River System.

(c)(1) Congress hereby approves the Master Plan as a guide for future water policy on the Upper Mississippi River system. Such approval shall not constitute authorization of any recommendation contained in the Master Plan.

(2) Section 101 of Public Law 95-502 is amended by striking out the last two sentences of subsection (b), striking out subsection (i), striking out the final sentence of subsection (j), and redesignating subsection "(j)" as subsection "(i)".

(d)(1) The consent of the Congress is hereby given to the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, or any two or more of such States, to enter into negotiations for agreements, not in conflict with any law of the United States, for cooperative effort and mutual assistance in the comprehensive planning for the use, protection, growth, and development of the Upper Mississippi River system, and to establish such agencies, joint or otherwise, or designate an existing multi-State entity, as they may deem desirable for making effective such agreements. To the extent required by Article I, section 10 of the Constitution, such agreements shall become final only after ratification by an Act of Congress.

(2) The Secretary is authorized to enter into cooperative agreements with the Upper Mississippi River Basin Association or any other agency established under paragraph (1) of this subsection to promote and facilitate active State government participation in the river system management, development, and protection.

(3) For the purpose of ensuring the coordinated planning and implementation of programs authorized in subsections (e) and (h)(2) of this section, the Secretary shall enter into an interagency agreement with the Secretary of the Interior to provide for the direct participation of, and transfer of funds to, the Fish and Wildlife Service and any other agency or bureau of the Department of the Interior for the planning, design, implementation, and evaluation of such programs.

(4) The Upper Mississippi River Basin Association or any other agency established under paragraph (1) of this subsection is hereby designated by Congress as the caretaker of the master plan. Any changes to the master plan recommended by the Secretary shall be submitted to such association or agency for review. Such association or agency may make such comments with respect to such recommendations and offer other recommended changes to the master plan as such association or agency deems appropriate and shall transmit such comments and other recommended changes to the Secretary. The Secretary shall transmit such recommendations along with the comments and other recommended changes of such association or agency to the Congress for approval within 90 days of the receipt of such comments or recommended changes.

(e) Program Authority

(1) Authority

(A) In general. The Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, may undertake, as identified in the master plan

(i) a program for the planning, construction, and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement; and

(ii) implementation of a long-term resource monitoring, computerized data inventory and analysis, and applied research program.

(B) Advisory committee. In carrying out subparagraph (A)(i), the Secretary shall establish an independent technical advisory committee to review projects, monitoring plans, and habitat and natural resource needs assessments.

(2) REPORTS. — Not later than December 31, 2004, and not later than December 31 of every sixth year thereafter, the Secretary, in consultation with the

Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, shall submit to Congress a report that —

(A) contains an evaluation of the programs described in paragraph (1);

(B) describes the accomplishments of each of the programs;

(C) provides updates of a systemic habitat needs assessment; and

(D) identifies any needed adjustments in the authorization of the programs.

(3) For purposes of carrying out paragraph (1)(A)(i) of this subsection, there is authorized to be appropriated to the Secretary $22,750,000 for fiscal year 1999 and each fiscal year thereafter.

(4) For purposes of carrying out paragraph (1)(A)(ii) of this subsection, there is authorized to be appropriated to the Secretary $10,420,000 for fiscal year 1999 and each fiscal year thereafter.

(5) Authorization of appropriations.—There is authorized to be appropriated to carry out paragraph (1)(B) $350,000 for each of fiscal years 1999 through 2009.

(6) Transfer of amounts.—For fiscal year 1999 and each fiscal year thereafter, the Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, may transfer not to exceed 20 percent of the amounts appropriated to carry out clause (i) or (ii) of paragraph (1)(A) to the amounts appropriated to carry out the other of those clauses.

(7)(A) Notwithstanding the provisions of subsection (a)(2) of this section, the costs of each project carried out pursuant to paragraph (1)(A)(i) of this subsection shall be allocated between the Secretary and the appropriate non-Federal sponsor in accordance with the provisions of section 906(e) of this Act; except that the costs of operation and maintenance of projects located on Federal lands or lands owned or operated by a State or local government shall be borne by the Federal, State, or local agency that is responsible for management activities for fish and wildlife on such lands and, in the case of any project requiring non-Federal cost sharing, the non-Federal share of the cost of the project shall be 35 percent.

(B) Notwithstanding the provisions of subsection (a)(2) of this section, the cost of implementing the activities authorized by paragraph (1)(A)(ii) of this subsection shall be allocated in accordance with the provisions of section 906 of this Act, as if such activity was required to mitigate losses to fish and wildlife.

(8) None of the funds appropriated pursuant to any authorization contained in this subsection shall be considered to be chargeable to navigation.

(f) (1) The Secretary, in consultation with any agency established under subsection (d)(1) of this section, is authorized to implement a program of recreational projects for the system substantially in accordance with the recommendations of the GREAT I, GREAT II, and GRRM studies and the master plan reports. In addition, the Secretary, in consultation with any such agency, shall, at Federal expense, conduct an assessment of the economic benefits generated by recreational activities in the system. The cost of each such project shall be allocated between the Secretary and the appropriate non-Federal sponsor in accordance with title I of this Act.

(2) For purposes of carrying out the program of recreational projects authorized in paragraph (1) of this subsection, there is authorized to be appropriated to the Secretary not to exceed $500,000 per fiscal year for each of the first 15 fiscal years beginning after the effective date of this section.

(g) The Secretary shall, in his budget request, identify those measures developed by the Secretary, in consultation with the Secretary of Transportation and any agency established under subsection (d)(1) of this section, to be undertaken to increase the capacity of specific locks throughout the system by employing nonstructural measures and making minor structural improvements.

(h)(1) The Secretary, in consultation with any agency established under subsection (d)(1) of this section, shall monitor traffic movements on the system for the purpose of verifying lock capacity, updating traffic projections, and refining the economic evaluation so as to verify the need for future capacity expansion of the system.

(2) Determination.

(A) In general. The Secretary in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, shall determine the need for river rehabilitation and environmental enhancement and protection based on the condition of the environment, project developments, and projected environmental impacts from implementing any proposals resulting from recommendations made under subsection (g) and paragraph (1) of this subsection.

(B) Requirements. The Secretary shall

(i) complete the ongoing habitat needs assessment conducted under this paragraph not later than September 30, 2000; and

(ii) include in each report under subsection (e)(2) the most recent habitat needs assessment conducted under this paragraph.

(3) There is authorized to be appropriated to the Secretary such sums as may be necessary to carry out this subsection.

(i) (1) The Secretary shall, as he determines feasible, dispose of dredged material from the system pursuant to the recommendations of the GREAT I, GREAT II, and GRRM studies.

(2) The Secretary shall establish and request appropriate Federal funding for a program to facilitate productive uses of dredged material. The Secretary shall work with the States which have, within their boundaries, any part of the system to identify potential users of dredged material.

(j) The Secretary is authorized to provide for the engineering, design, and construction of a second lock at locks and dam 26, Mississippi River, Alton, Illinois and Missouri, at a total cost of $220,000,000, with a first Federal cost of $220,000,000. Such second lock shall be constructed at or in the vicinity of the location of the replacement lock authorized by section 102 of Public Law 95-502. Section 102 of this Act shall apply to the project authorized by this subsection.

2. ASSESSMENT OF EXISTING RESOURCES

A. Resource History of Project Area. The IWW historically functioned as a significant resting and foraging area for waterfowl during spring and fall migration. The shallow floodplain lakes provided abundant aquatic and emergent vegetation utilized as food and cover by diverse species of fish, water birds, and other animals. The wide floodplain also supported extensive bottomland forests with a substantial number of pin oaks, pecan, and hickories. This rich and diverse combination of food and cover supported large populations of waterfowl, fishes, and other wildlife. For these reasons, the IWW was once considered one of the most productive riverine systems for fish and wildlife in North America.

B. Description of Project Area and Current Management. The Rice Lake SFWA is located in the LaGrange Pool of the IWW. The Project area is a complex of natural backwater lakes, sloughs, and floodplain lands located on the west side of the IWW between approximate RM 132.0 and 138.0, on the east side of U.S. Route 24 in Fulton County. Figure 1 shows the dominant land cover types in the LaGrange Pool and the Rice Lake SFWA. The Project area is located adjacent to and immediately downstream of the Banner Marsh SFWA, the location of another recently constructed HREP.

Rice Lake SFWA encompasses approximately 6,800 acres of the floodplain. Rice Lake, Big Lake, Beebe Lake, and Goose Lake are the principle water bodies. The Slim Lake Natural Area lies within the Project area and is listed on the Illinois Natural Areas Inventory because it provides habitat for a Federally threatened species, Decurrent false aster (*Boltonia decurrens*), and because of the presence of a bald eagle night roost. The Project area also includes several smaller, separate, wetland management units that are managed for native moist-soil vegetation and planted wildlife food crops. The remaining Project area is covered by agricultural fields, an active gravel quarry, or bottomland hardwood forest typical of the Illinois Waterway Valley. Currently, Big Lake, Goose Lake, Beebe Lake, and the quarry are open to the IWW and maintain approximately the same water elevation as the river (flat pool 428.4 at Havana gage). Rice Lake has the capability to be held higher (with pumping) because of the Narrows Dam (top elevation 439.0), which separates Rice Lake from Big Lake.

The Rice Lake SFWA began with an initial purchase of 2,370 acres of land in 1945, through Federal assistance under the Pittman-Robertson Act. The area was designated as a refuge for migratory waterfowl with a portion open to hunting. Additional parcels of land acquired during the 1950s through the early 1980s increased the total acreage to approximately 2,700 acres. The purchase of two major waterfowl clubs in 1986 (2,900 acres) expanded the Rice Lake SFWA to approximately 5,600 acres at the beginning of the HREP planning process.

Following initiation of HREP planning and design, the ILDNR acquired Duck Island, which was a 1,200 acre private inholding that was nearly surrounded by ILDNR owned Project lands. Duck Island is a natural floodplain ridge that separates Rice Lake to the west and Big and Goose Lakes on the east. Approximately 600 acres of this property had been leased for agricultural use and is currently planted in row crops (corn and soybeans) during the growing season. A tenant aggregate mining operation encompassing some 131 acres is also located on Duck Island.

Primary human uses of the Rice Lake SFWA to date have been wildlife observation, waterfowl hunting, sport fishing, camping, and commercial fishing. Constructed facilities for public use include

a camping area, a boat channel with floating docks and concrete launching ramp, parking areas, a public access road, administrative and maintenance buildings, and service roads. Most of these facilities are located on the west side of the Project area adjacent to U.S. Highway 24. Existing water control structures and other facilities currently operated for habitat management purposes include the Narrows Dam; a pump station used to move water from the IWW into Rice Lake; and a number of low water control levees, gated outlets, and drainage ditches associated with the smaller management units. The remnants of a water control berm (known locally as the Hate Levee) are located at the southern end of Goose Lake. This structure was largely eradicated by repeated flooding and has been nonfunctional since the ILDNR acquired the property it occupies.

Narrows Dam, located between Rice Lake and Big Lake, is operated by the ILDNR for the benefit of migratory waterfowl. When the stoplogs are removed, the Dam allows for summer drawdowns to promote vegetation growth and when the stoplogs are in, water levels can be maintained up to elevation 439.0. The existing 50,000 gpm pump station, located near Copperas Creek, is used to gradually fill Rice Lake over a 21-day period during the fall waterfowl migration. The pump station lies on the downstream end of a 3,900-foot access channel from the IWW. This access channel requires periodic dredging every three years to supply adequate water to the pump station. Acceptable placement of this dredged material is becoming an increasing problem as historic adjacent placement may no longer be feasible. The Voorhees Unit was a former leveed gun club that the ILDNR manages since purchasing this portion of the project in 1986. The Voorhees pump station has been used primarily for draining the unit as portable pumps are currently used for filling the unit.

C. Wetland Resources. The topography of the Rice Lake SFWA is primarily a low, relatively flat floodplain landscape that is characterized by a mosaic of backwater lakes, sloughs, floodplain forest, mud flats, and managed fields. Examination of National Wetland Inventory maps of the Project area indicates that most of the present acreage of the Rice Lake SFWA is classified as palustrine or lacustrine wetland. Big Lake, Rice Lake, and the smaller permanent water bodies comprise over half (>2000 acres) of the total wetland acreage. In addition, over 1,500 acres of nonforested wetland are subject to seasonal or temporary flooding on an annual basis. Annual grasses and forbs dominate the vegetative cover on the majority (>1200 acres) of these areas, with perennial emergents covering less than 10 percent of the non-forested wetland acreage (figure 1). Submerged aquatic vegetation (SAV) has drastically declined from historic levels both in the Rice Lake SFWA and the larger Illinois River ecosystem, and is present only as a minimal remnant within the Project area (see Appendix C). Several hundred acres of exposed mud flats are normally present during low river stages.

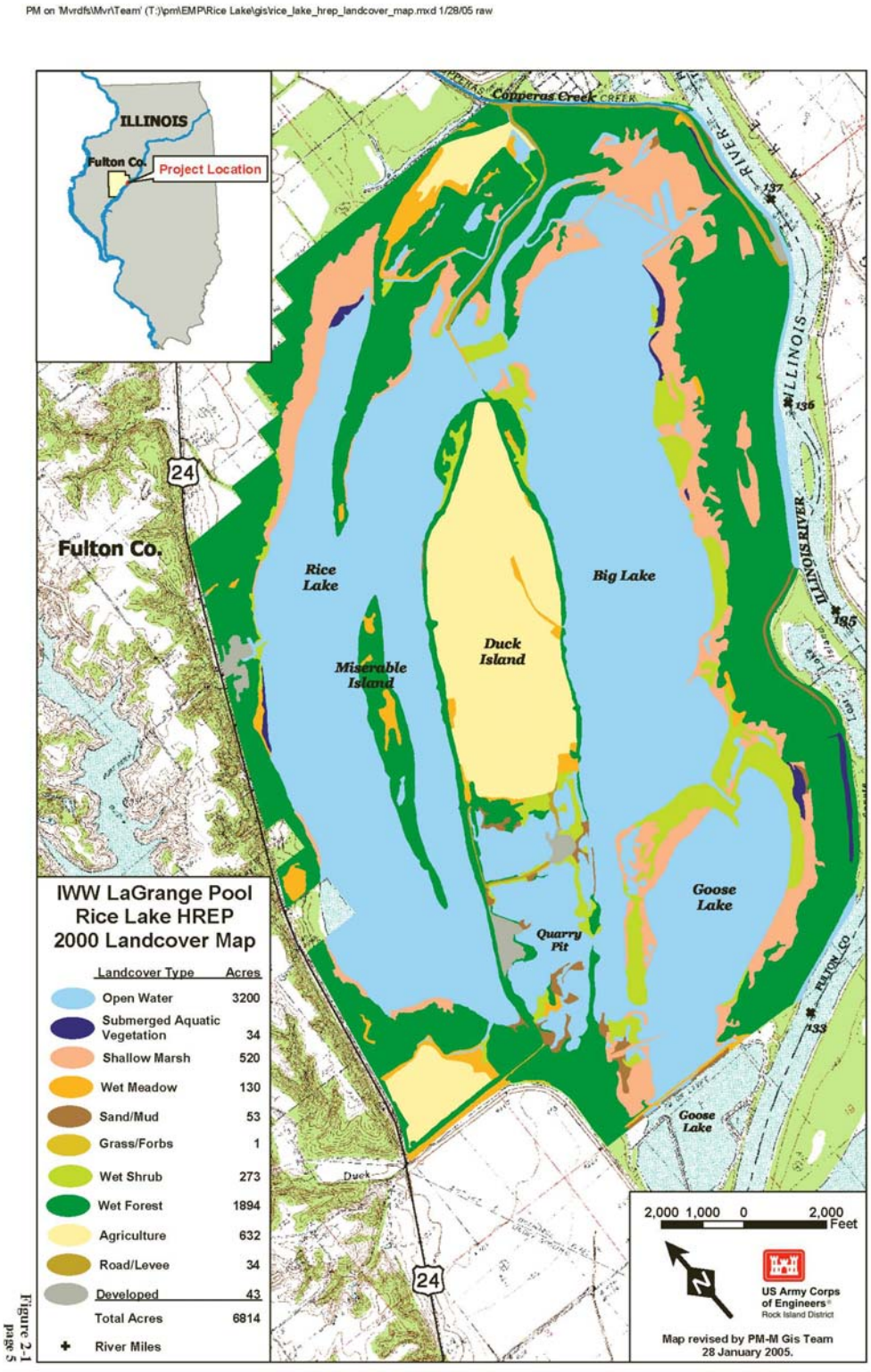

Figure 1. 2000 Illinois Waterway LaGrange Pool, Rice Lake HREP Land Cover Map

The Project area is a haven to numerous species of wildlife, and hosts thousands of migrating waterfowl, herons, and shorebirds. Strategically located within the Illinois Waterway Valley flight corridor of the Mississippi Flyway, this area and other sites in the immediate region are famous as historic resting areas for waterfowl and shorebirds on both their spring and fall migrations to and from their breeding grounds in Canada and their wintering grounds in the Mississippi delta, along coastal marshes, and Central and South America. Historically, the Illinois Waterway Valley has been one of the most important migration areas for mallards in the United States.

A large variety of birds utilize the Project area during some part of their annual life cycles. From 1987 to 1997, 238 species of birds were reported for the Rice Lake SFWA. Waterfowl species are perhaps the most easily recognized due to their high visibility and recreational and economic value. A mean annual total of 2,517,100 duck use-days were recorded for the Project area during the period 1975 to1987, as reported in annual aerial inventories conducted by the Illinois Natural History Survey.

In addition, the Project area provides extremely important foraging habitat for wading birds such as herons and egrets, and shorebirds such as sandpipers and yellowlegs. In 1997, the ILDNR nominated the Rice Lake SFWA for listing in the Important Bird Area program administered by the American Bird Conservancy in cooperation with BirdLife International, a partnership of non-governmental organizations with a shared interest in bird conservation.

Migration during fall and spring is an energy-demanding activity for birds. Migrants need access to nutritious foods and rest at stopover areas to replenish reserves and satisfy the energetic costs of migration. As a result, waterfowl rely on diverse habitats at mid-migration latitudes to satisfy nutritional needs of various events during their annual cycle. Consequently, wetland programs for waterfowl in Illinois generally are directed at providing mid-migration habitat (Havera 1996).

Bellrose et al. (1979) reported that in the late 1930s some duck clubs in the Illinois Waterway Valley began to use moist-soil management as a way to attract ducks to their property. Frederickson and Taylor (1982) defined moist-soil management as the manipulation of soil and water to produce food and cover in areas that experience seasonal flooding. The primary objective of moist-soil management is to mimic the natural (historic) water regime by lowering water levels during summer to expose mudflats for germination and growth of native annual plants typically found in seasonally flooded wetlands (generally referred to as “moist-soil” vegetation). Controlling the frequency, timing, length, and depth of water level manipulations can provide necessary habitat resources and conditions at times coincident with migration and other events in the annual life cycle of waterfowl. Moist-soil management continues to be one of the most effective techniques for managing migratory waterfowl habitat on public and private lands.

D. Floodplain Resources. Wet floodplain forest, represents the largest single land cover type in the Rice Lake SFWA (approximately 1,854 acres of the Project area). Dominant species include silver maple, cottonwood, green ash, and American elm. The majority of the forested area is composed of pole size to sawlog size (5 to 18-inch dbh) trees with limited reproduction. Willows and silver maples have invaded the shallow areas of Big Lake and Goose Lake due to the inability to control water levels in these areas. A small percentage of other desirable native species such as pin oak, basswood, river birch, box elder, mulberry, and pecan were reported as historically occurring on areas of higher elevation in the Project area.

The hydrologic regime of the Illinois River has probably been the single largest factor in determining the forest condition at Rice Lake SFWA, though historic logging, fire suppression, and other disturbance regimes also have influenced forest structure. Mast producing tree species were once an integral part of the forestry resources present in the Illinois River floodplain. However, recurrent major flooding within the past two decades (including record floods) has virtually eliminated mast producing trees from the floodplain forest in the project area.

The Project area also provides habitat for a number of mammal species. Game and furbearing mammals important to the Project area include fox squirrel, rabbit, woodchuck, white-tailed deer, muskrat, raccoon, opossum, skunk, mink, red fox, coyote, and beaver. Small mammal species collected during a 1987 survey of the Project area included short-tailed shrew, least shrew, thirteen-lined ground squirrel, western harvest mouse, deer mouse, white-footed mouse, meadow vole, prairie vole, house mouse, little brown bat, Keen's bat, big brown bat, and red bat.

E. Aquatic Resources. The principal water bodies within the Project area are Rice Lake, Big Lake, Goose Lake, Slim Lake, and Beebe Lake. These shallow backwater lakes are sustained primarily by groundwater seepage and overflow from the IWW. The only deepwater areas within the Project area boundary are located in the quarry at the downstream end of Duck Island. Because the Rice Lake SFWA is not separated from the IWW by a high levee, its fish populations fluctuate in composition, numbers, and condition as the area is alternately flooded and dewatered by river levels. The basin of Rice Lake is broad and dish-shaped, constraining the quality and quantity of year-round fish cover. Ongoing water level management activities involve midsummer drawdowns to promote moist-soil plant production. As a result, water levels in Rice Lake during July and August are typically no more than 12 to 16 inches, with water temperatures during drawdown approaching 90 degrees Fahrenheit. These conditions severely limit both the composition and survival of fish populations.

Most fish species found in the Project area are common to the LaGrange Pool of the IWW. Thirty-six fish species have been collected from the waters of the Rice Lake SFWA during recent years. A random sampling of Rice Lake conducted during 1991 and 1992, as part of the EMP's Long-Term Resource Monitoring Program (LTRMP), collected 15 species. The LTRMP sampling of Big Lake, Goose Lake, Beebe Lake, and the Duck Island quarry during 1994 and 1995 yielded 35 species and 1 hybrid. The ILDNR's district fisheries biologist reported that several paddlefish were documented as occurring in this area during 1995, and three radio-tagged largemouth bass were documented traveling between Havana and the Duck Island quarry.

F. Water Quality. Baseline water quality monitoring studies conducted at the Rice Lake SFWA from May 1987 through February 1994 have shown that, on occasion, pH values exceed 9.0 and dissolved oxygen concentrations fall below 5 mg/l. Periodic extreme plant photosynthesis/respiration would appear to be the primary factors contributing to these events. The shallow nature of the lakes coupled with the aquatic vegetation present most likely result in wide swings in pH values and dissolved oxygen concentrations during a typical summer day. A combination of resuspended bed material and algal biomass appears to be causing the lakes' relatively high suspended solids concentration. A more detailed analysis of baseline water quality monitoring results can be found in Appendix F, *Water Quality*.

G. Endangered Species. The USFWS database lists the following species as known to occur or potentially occur in Fulton County:

Eastern prairie fringed orchid. The eastern prairie fringed orchid (*Platanathera leucocephalus*) is a federally-threatened plant species that is found in wet grassland habitats in Illinois and other Midwestern states. Suitable habitat for this species does not currently exist within the HREP construction footprint, and the species has not previously been recorded within the Rice Lake SFWA. The planting feature proposed as part of this HREP would restore approximately 57 acres of wet meadow/grassland habitat in the Project area. However, the relatively small size of this restoration and the lack of a previously documented occurrence of the species in the vicinity suggest that the likelihood of HREP implementation facilitating future occurrence of eastern prairie fringed orchid in this area is slight.

Decurrent false aster. The decurrent false aster (*Boltonia decurrens*) is a federally-threatened plant species that historically is found in the Illinois River floodplain and in the Mississippi River floodplain below the confluence with the Illinois River. Populations of this species are known to exist in the Rice Lake SFWA. Coordination with the Illinois Department of Natural Resources, Natural Heritage Division indicated that the Natural Heritage database has records of *B. decurrens* occurring in the vicinity of the construction footprint of the proposed pump station and a segment of the perimeter spillway approximately one-half mile downstream (south) of the proposed pump location. Two populations recorded in the Natural Heritage database for the SFWA are not located in the vicinity of any proposed HREP features. Additional *B. decurrens* plants were identified within Pond Lily Lake during site investigations in 2003 mentioned earlier, but are not listed in Natural Heritage records.

Decurrent false aster is an early-successional floodplain species that requires full sunlight and is intolerant of shading or closed-canopy conditions. Periodic flooding is important for the continued growth of *B. decurrens* due to the deposition of seeds by receding floodwaters and by the floodwaters acting as a control for competing upland plants.

Indiana bat. The Indiana bat (*Myotis sodalis*) is a federally-endangered species that is listed as potentially occurring in Fulton County, though there are no records of the species occurrence within the county or the Rice Lake SFWA. However, the species may potentially roost and forage in floodplain forests during spring and summer months where suitable habitat exists within the Rice Lake SFWA. Suitable summer habitat in Illinois is considered to have the following characteristics within a ½ mile radius of a Project site: forest cover of 15 percent or greater; permanent water; and potential roost trees with 10 percent or more peeling or loose bark.

In addition to the species listed above, the sheepnose (*Plethobasus cyphyus*) is a mussel species that has been proposed as a candidate for listing as federally threatened or endangered. This species historically occurred in large rivers, including the Illinois River in Fulton County. The sheepnose mussel is primarily a larger-stream species occurring mainly in shallow shoal habitats with moderate to swift currents over coarse sand and gravel but includes mud, cobble, and boulders as well. This type of aquatic habitat is not present within the backwater lakes and sloughs of the Rice Lake SFWA. There are no recent records of the species occurring in the Illinois River adjacent to the Project area, and, with the exception of the pump station intake, no HREP construction activities within the river are proposed.

While no longer listed as endangered or threatened, the bald eagle (*Haliaeetus leucocephalus*) is a federally-protected species that utilizes large trees for roosting within the Rice Lake SFWA during the winter months, and has periodically been recorded as nesting in the area during spring and summer. In 1997 an active bald eagle nest was located within the SFWA, which produced two fledglings. A portion of the Rice Lake SFWA has been designated as a significant winter roost site, and the ILDNR's present management plan provides for a refuge area for the species. The ILDNR has previously identified an active bald eagle nest located approximately 250 from the construction footprint along Slim Lake; however, the nest has not been rebuilt in the last 2 years.

In addition to the decurrent false aster and Indiana bat, at least 11 state-listed endangered or threatened species have been recorded on the complex:

- osprey (*Pandion haliaetus*)
- American bittern (*Botaurus lentiginosus*)
- least bittern (*Ixobrychus* exilis)
- redspotted sunfish (*Lepomis miniatus*)
- buffalo clover (*Trifolium reflexum*)
- blazing star (*Liatris scariosa var. nieuwlandii*)
- black-crowned night heron (*Nycticorax nycticorax*)
- upland sandpiper (*Bartramia longicauda*)
- king rail (*Rallus elegans*)
- starhead topminnow (*Fundulus dispar*)
- Wolf's bluegrass (*Poa wolfii*)

H. Historic Properties. The Corps coordinated the Project features with the ILDNR and the Illinois Historic Preservation Agency (IHPA) requesting comments concerning the possible effects of the Project on historic properties. Correspondence from the IHPA, dated July 20, 1995 (Appendix A, IHPA LOG #950706004P-F), deferred comment to the ILDNR.

The ILDNR provided copies of cultural resource management reports documenting historic properties (Schroeder 1990, 1991, 1994). These reports document numerous archeological historic properties. These previously documented historic properties were avoided during the design of this HREP.

In July 1993, the IHPA and the Corps determined that portions of the IWW Navigation Channel, from RM 80.2 to 327.0, were determined eligible for listing on the National Register of Historic Places (NRHP). The Corps and the IHPA have undertaken investigations to determine significant elements and structures within the system. As a result, it is the preliminary opinion of the Corps that the Copperas Creek lock is eligible for the NRHP, as documented in Rathbun Associates (1996).

In order to meet the requirements for historic properties identification as set out in 36 CFR Part 800.4 of the Advisory Council on Historic Preservation rules implementing Section 106 of the National Historic Preservation Act (NHPA), the Corps contracted for the cultural resource survey report by Illinois State Museum (1996). This report investigated 177.87 hectares (439.5 acres) not covered by previous cultural resource studies conducted by the Illinois State Museum and others. The results of the Illinois State Museum (1996) investigation are discussed in section 9, paragraph D.

I. Sedimentation. Backwater lakes on the IWW from Peoria Pool to Alton Pool, including Rice Lake, have experienced varying levels of sedimentation since 1903, resulting in significant loss of water depth and capacity. Previous studies have attempted to estimate sedimentation rates in these lakes. Demissie et al. found that sedimentation rates varied based on "lake location with respect to the river, the significance of local sediment inputs, and lake geometry." These rates varied from pool to pool, as well as among lakes in the same pool. Lee and Stall examined four backwater lakes, two in greater detail, and found average sedimentation rates ranging from 0.18 in/year (Swan Lake) to 0.59 in/year (Lake DePue). Demissie et al. used Lee and Stall's findings to estimate an average rate of 0.32 in/year in Rice Lake. This rate is similar to other backwater lakes in LaGrange Pool, and is probably an accurate estimate of historical sedimentation.

J. Hazardous, Toxic, and Radioactive Waste. A hazardous, toxic, and radioactive waste (HTRW) site assessment was conducted. The Project is located in an area that primarily is and historically has been agricultural, quarry, and outdoor recreational land. There is little evidence that the land has been used for other purposes. There were no obvious indications of potential contamination sources or migration pathways from surrounding properties. It does not appear that there is a risk of hazardous, toxic, or radioactive waste contamination within the Project area.

K. Altered Hydrologic Regime. Basin changes and river management have altered the water level regime along the main stem Illinois River, stressing the natural plant and animal communities along the river and its floodplain. Land use changes, the construction of the locks and dams (which create relatively flat navigation pools), and isolation of the river main stem from its floodplain have all impacted the water level regime to varying extents. Two of the most critical results from the basin changes and river management, are the increased frequency and increased magnitude of water level fluctuations, especially during summer and fall low water periods. The lack of the ability to mimic natural hydrologic regimes in areas upstream of the navigation dams is also a problem. Increased flow variability has reduced ecological integrity in tributary areas as well.

The alteration of the hydrologic regime is considered to be the most significant change affecting aquatic biodiversity in the Illinois River Basin. In the developed watersheds of tributary streams feeding the river, stormwater inflows likely have higher peak flows than occurred under pre-development conditions, due to land-use changes and increased efficiency brought about by channelization. These storm flows result in rapidly rising and falling water levels and more uneven delivery of flows to the Illinois River. Land-use changes and drainage are believed to have increased the volume and the erosive force of water delivered to the river and may contribute to water level fluctuations in the main stem. A major impact of increased drainage is the decrease in base flows that impact aquatic communities in the tributaries during low water periods.

Land use changes in the basin and river management have altered the water level regime along the main stem Illinois River, stressing the natural plant and animal communities along the river and its floodplain. The increased number of water fluctuations, especially during summer and fall low water periods, and the constant inundation of the areas upstream of the navigation dams have altered the hydrologic regime of the river (figure 2), thereby contributing to the degradation of the river system. The biotic composition, structure, and function of aquatic, wetland, and riparian ecosystems depend largely on the hydrologic regime. The flow regime (magnitude, frequency, duration, timing, rate of

change) affects water quality, energy sources, physical habitat, and biotic interactions, which, in turn, affect ecological integrity (Poff et al. 1997). Past management efforts have focused on requirements of one or few species of fish. The range of flows needed to sustain aquatic and riparian ecosystems may be much greater. Elimination of the summer low water periods prohibits compaction of sediments. Therefore, suspended sediments settle only loosely to the lakebed, creating a soft bottom in which aquatic plants cannot take root.

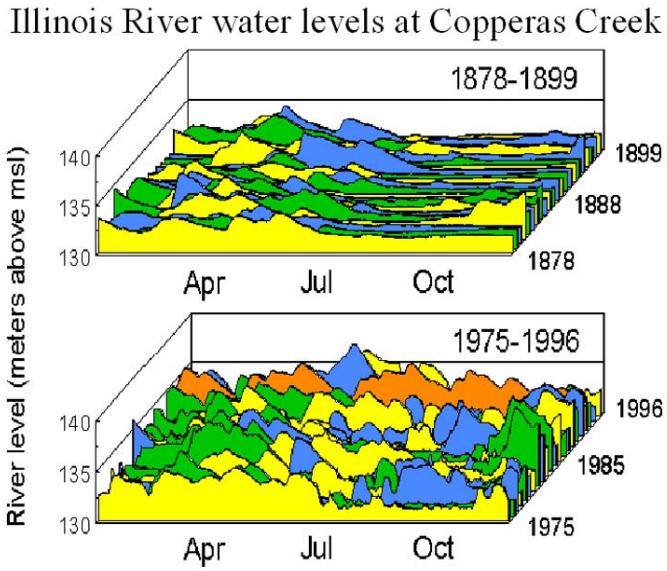

Figure 2. Change in Water Level Fluctuations at Copperas Creek Gage

Rapidly changing water levels of the Illinois River during the growing season (a.k.a. the summer "bumps") frequently flood young, moist soil plants on mud flats before they are developed enough to survive inundation. In predevelopment conditions, water levels receded during the summer and allowed moist soil plants to grow on exposed mud flats. The summer "bumps" are a critical factor, limiting these plants growing in areas within or connected to the river. Significant water level fluctuations occur during the growing season, severely limiting plant germination, growth or survival. Past efforts may have failed to consider the full range of hydrological variability and the influence of hydrologic process on geomorphic changes and ecosystem functions (Richter et al. 1996).

3. PROJECT OBJECTIVES

A. Problems and Opportunities. Over the past century, increased human activity within the IWW basin, floodplain, and channel has altered the hydrology, topography, and biotic communities originally present in the Project area. These alterations have reduced native plant and animal populations, degraded the quality of remaining natural resources and plant communities, impaired ecosystem functions, and threaten the future sustainability of the river-floodplain ecosystem.

1. Wetland Habitat Problem: Decreased Reliability of Seasonal Food and Cover for Migratory Birds. Alterations of the historic water level regime within the past 70 years have limited the ability of the Project area to produce and sustain the native plant community that historically dominated the region and provided habitat for the diverse native wildlife community. Recreating the natural river stage cycle through a combination of active and passive water level management measures is critical to the restoration of natural floodplain and aquatic habitats. Seasonal flooding and dewatering of the lake areas and management units of the Rice Lake SFWA are essential to provide the conditions necessary to promote growth of important native annual plants, which serve as a food resource and seasonal resting area for migratory waterfowl and shorebirds.

Existing facilities at the Rice Lake SFWA provide only very limited water level control capability on Rice Lake and some of the smaller moist-soil management units. Because no facilities for water level management currently exist on Big Lake and its associated management units, water levels in these portions of the Project area are entirely controlled by the stage of the IWW. Unseasonable midsummer fluctuations in river stage that result from the landscape modifications discussed above frequently prevent or reduce growth of annual native food plants in the area.

2. Aquatic Habitat Problem: Loss of Fish Access to Deep Aquatic Habitat during Low Water Periods. Historically, the frequency and duration of Illinois River flooding has increased over time as upstream development has intensified the rate of runoff. According to a 1979 study conducted by the Illinois Natural History Survey, increased siltation is reducing water depths in both Big Lake and Rice Lake. While fish isolated from the river in Big Lake during summer low-water periods have access to deepwater areas in the Duck Island quarry, Rice Lake has no interior deepwater areas and no access to the quarry or the river when water levels fall below 439.0 NGVD (the top elevation of the Narrows Dam). Currently, fish that move into Rice Lake during high water events and fail to move out during falling river stages have no avenue of escape from high temperatures or low DO levels, greatly increasing the potential for fish kills. Fish kills may also increase the potential for outbreaks of avian botulism, which can cause mortality in resident and migratory waterbird populations. Avian botulism outbreaks have occurred in the nearby Lake Chautauqua Refuge following fish kills caused by drawdowns for moist soil unit operation. No outbreaks have occurred at Rice Lake SFWA, but conditions similar to Lake Chautauqua could occur if fish have no escape route to deeper water areas.

Avian botulism is a paralytic disease of birds caused by ingestion of a toxin produced by the bacteria, *Clostridium botulinum*. This bacterium is widespread in soil and requires warm temperatures, a protein source, and an anaerobic (depleted oxygen) environment in order to become active and produce toxin. Birds either ingest the toxin directly or may eat invertebrates containing the toxin. A cycle develops in a botulism outbreak when maggots feed on animal carcasses and ingest toxin. Birds that consume toxin-laden maggots can then develop botulism. Birds with the disease are unable to use their wings and legs normally or control other muscles. Birds with paralyzed neck muscles cannot hold their heads up and often drown. Death can also result from water deprivation, electrolyte imbalance, respiratory failure, or predation.

These conditions reduce the ability of the Rice Lake SFWA aquatic areas to contribute to the long-term sustainability of the larger IWW aquatic ecosystem.

3. Floodplain Habitat Problem: Decreased Acreage and Diversity of Native Floodplain Vegetation as Habitat for Resident and Migratory Wildlife. Historic conversions of floodplain forest and wet prairie lands in the IWW floodplain to agricultural use reduced the quantity and quality of both mesic floodplain forest and wet meadow/grassland habitats. In addition, the pin oak population, a critical component of the historic floodplain forest community, historically present within the floodplain forests of the SFWA was largely eradicated by severe flooding during the past two decades. Lack of mast-tree regeneration, reduction of species diversity, and increased tree mortality can be directly attributed to the increase in flood frequency and duration over time. These losses in habitat value limit the present and future ability of the Project area to attract and sustain a diverse floodplain forest community, providing ecosystem services to resident and migratory wildlife.

The entire UMRS has undergone dramatic changes in the extent, composition, and structure of its floodplain forests over the last two centuries. The report *Ecological Status and Trends of the upper Mississippi River System,* found that what was once a diverse forest are composed of mixed silver maple, willow, cottonwood, oak-hickory, swamp cypress, shrub, and plantation communities is now nearly 80 percent mixed silver maple. The opportunity exists at Rice Lake SFWA for restoration of a large contiguous tract of floodplain forest at an elevation suitable to provide for a sustainable community featuring native mast producing trees such as pin oak, bur oak, swamp white oak, shagbark hickory, shellbark hickory, bitternut hickory, pecan and hackberry.

Opportunities exist to increase the reliability of seasonal food and cover for migratory birds by changing the hydrology of the site, to improve fish access to deep aquatic habitat during low water periods by restoring connectivity to the river, decrease the likelihood of an outbreak of avian botulism by providing fish egress, and increasing the acreage and diversity of native vegetation by changing the hydrology of the site and addressing the lack of natural regeneration.

B. Future Without-Project Condition. For planning purposes, future conditions without implementation of the Project were assumed to be similar to baseline conditions. Land cover in the future would be similar to current conditions. Habitat quality would be equal to or less than what currently exists in the Project area. Rice Lake would be actively managed by the ILDNR using its existing pump station for waterfowl food production and use, but Big Lake and associated shallow water areas would continue to be subject to Illinois River fluctuations during the growing season and interior water levels could not be managed in this portion of the SFWA. Rice Lake would continue to be isolated from deepwater areas when Illinois River levels drop below the top elevation of the Narrows Dam. The Duck Island fields would continue to be cultivated for agricultural production.

Future river stage seasonal patterns of fluctuation and recurrence of moderate to severe flooding were assumed to be similar to river stage fluctuations recorded over the past 50+ years. In most cases, future without-project conditions were assumed to be similar, though not identical, to baseline conditions (no significant future degradation or loss of habitat).

The potential for restoration of historically diverse native floodplain forest on Duck Island through passive means (cessation of cultivation followed by natural regeneration) was assumed to be severely limited to nonexistent due to altered hydrology of the Illinois River over the last 70+ years combined with depletion of natural seed banks.

C. Resource Significance. The UMRS represents the largest riverine ecosystem in North America and the third largest in the world. The UMR ecosystem encompasses over 2.6 million acres of aquatic, wetland, forest, grassland, and agricultural habitats, supporting more than 300 species of birds; 57 species of mammals; 45 species of amphibians and reptiles; 150 species of fish; and nearly 50 species of mussels. More than 40 percent of North America's migratory waterfowl and shorebirds depend on the food resources and other life requisites (shelter, nesting habitats, etc.) that the system provides. The importance of these resources was recognized by Congress in WRDA 1986 by their declaration of the UMRS as a "nationally significant ecosystem," as noted in section 1, paragraph F. Institutional recognition of the significance of this resource was further recognized by Congress' initial and continued authorization of the EMP for the planning, construction, and evaluation of measures for rehabilitation and enhancement of fish and wildlife habitat in the UMRS.

The National Research Council recognized the ecological significance of large floodplain rivers and identified the Mississippi River and the IWW as examples of two such rivers in the U.S. that could become healthy again with proper management and restoration. Floodplain forests are declining in the Mississippi River and the IWW floodplains due to agricultural and urban development, alteration of natural riverine flood pulses, rising water tables, and island loss due to wind and wave action. The remaining forests are changing in composition from high species diversity (including mast-producing trees) to a more monotypic forest dominated by silver maple and even aged stands with little to no understory or regeneration of seedlings. Native floodplain forest with a substantial hard mast-producing species composition is among the rarest ecotypes in the Illinois River floodplain. Remaining fragments are vulnerable to eradication from extreme high water events, and lack the size necessary to be self-sustaining or to support forest-dependent resident and migratory wildlife species that require hard mast food resources.

Floodplain grasslands are an important ecotype that was common and abundant in the UMRS ecosystem prior to the extensive agricultural development of the floodplain from the late 19th through the mid 20th centuries. Today, wet-mesic native floodplain grasslands are the rarest and most fragmented native ecotype in the UMR ecosystem.

Within LaGrange Pool, existing land cover is predominately agricultural (47 percent of total floodplain acreage) and likely to remain so for the foreseeable future. Opportunities for restoration of native floodplain ecotypes and habitats are limited by the small percentage of land in public ownership (16 percent of total floodplain acreage). For this reason, the restoration of land and water resources of the Rice Lake SFWA has an increased importance.

D. Systemic Habitat Goals (Habitat Needs Assessment). The Habitat Needs Assessment prepared for the EMP in October 2000 summarized habitat needs for the IWW Reach of the UMRS as follows:

- restore existing backwaters so that 25 percent of existing backwater lakes (19,000 acres) have an average depth of 6 feet
- increase depth diversity and connectivity throughout the river
- restore hydrologic variability needed to restore and maintain existing backwater habitats

E. General Fish and Wildlife Management Goals for Rice Lake SFWA. The primary long-range management goal of the ILDNR at the Rice Lake SFWA is to moderate the historic trend of habitat degradation within the confines of the Project area through implementation of a management, development, and acquisition program that will provide quality habitat, attractive to many species of wildlife, while at the same time providing the public with increased hunting, fishing, and other recreational opportunities (Illinois Department of Conservation, presently ILDNR, 1989). The objectives of the Rice Lake SFWA as stated in the ILDNR's Natural Resource Management Plan (1989) are as follows:

Primary Objective. The primary objective of Rice Lake SFWA is to conserve and enhance, where appropriate, essential quality nesting and mid-migration habitat, including refuge, for both migratory and resident waterfowl populations utilizing the Illinois Waterway Valley flight corridor of the Mississippi Flyway.

Secondary Objectives. The following secondary objectives have been developed to provide guidelines for acquisition, development and management, including public usage, of the site:

1. Conserve natural bottomland habitat of migratory and resident, game and non-game fauna inhabiting the site, including rare, threatened, and endangered species.
2. Conserve natural bottomland habitat of native flora inhabiting the site, including rare, threatened, and endangered species.
3. Provide an opportunity for quality public waterfowl hunting to the extent that the primary objective is not jeopardized.
4. Provide an opportunity for other compatible public recreational usage, including sport and commercial fishing, furbearer trapping, vehicular camping, pleasure boating, hiking, wildlife observation, and sightseeing to the extent feasible.

The emphasis on wetland and waterfowl management at the Rice Lake SFWA reflects not only the immediate goals of local resource managers, but also those of the FWIC for habitat enhancement in Pools 11 through 22 of the UMR and the IWW, Partners in Flight, and the North American Waterfowl Management Plan (NAWMP). The NAWMP aims to increase waterfowl populations and their habitats, particularly those at critically low-levels. It has been estimated that 20 percent of all ducks in North America utilize the UMRS for feeding and resting during migration (Upper Mississippi River Basin Commission, 1981). This statistic points to the need for optimum management of refuge areas such as the Big Lake portion of the Rice Lake SFWA. In fact, a recent study indicates that refuge areas may be necessary to prevent disturbance of waterfowl during spring and fall migrations (Havera *et al.,* 1992), particularly in areas where waterfowl numbers have declined.

In response to recommendations that the Rice Lake SFWA participate in the Western Hemisphere Shorebird Reserve Network, the ILDNR has recommended that the Project area be managed to complement shorebird use, within the context of the primary site objective.

Successful management of the lake areas and management units of the Rice Lake SFWA is dependent on the ability to control water levels in the Project area. The success of water level control efforts on Rice Lake is dependent on whether water levels on the IWW remain below elevation 439.0 NGVD

(the spillway crest elevation of the Narrows Dam) during the critical drawdown period. The water level management plan at Rice Lake, when IWW elevations allow, is to hold the lake at a spring pool elevation of 437.0 NGVD, creating an approximately 1,400 surface-acre lake with an average depth of 2.4 feet and a shoreline at the timber's edge. During the third week of June, Rice Lake is drawn down over a 21-day period to elevation 435.0, exposing approximately 500 acres of mudflats. This exposure facilitates firming of the highly flocculent lake-bottom material. This, in turn, encourages production of native moist-soil vegetation and also allows aerial seeding of fast-growing crops when unseasonable river stage fluctuations reduce native food plant production. Both the native moist-soil plants and the non-native crop species provide a high quality food base for resident and migratory wildlife. In mid-September (or earlier during drought conditions), the lake is recharged by pumping to return to elevation 437.0 by the beginning of November.

The preferred management plan for Big Lake would be to hold the lake at a spring pool elevation of 436.0, with drawdown over a 21-day period to elevation 434.0 beginning June 15. Under current conditions, this management plan cannot be reliably implemented due to midsummer fluctuations in IWW water levels and the inability to control water levels in the lake independent of river stage.

During Project planning, the ILDNR's management goals for Duck Island also included restoring a portion of the agricultural fields to native vegetative cover types historically present in the floodplain. Acquisition of the Duck Island property created an opportunity for large-scale restoration of native plant communities, specifically wet meadow and floodplain forest dominated by mast-producing (e.g. oaks and hickories) tree species.

F. Project Goals, Objectives, and Potential Enhancement Features. Based on the identified problems, systemic goals of the cooperating agencies, and the overall fish and wildlife management goals of the Project Sponsor, the following specific goals, objectives, and potential Project features have been developed for this HREP (table 1). Potential Project features and design alternatives are described in detail in sections 4 and 5.

G. Planning Constraints. The following constraints were considered in plan formulation:

- **Environmental Laws and Regulations.** Construct features consistent with Federal, state, and local laws.
- **Flood Heights.** Restoration features should not increase flood heights or adversely affect private property or infrastructure.
- **Cultural Resources and Historic Properties Laws and Regulations.** Ensure Project features are in compliance with applicable laws and regulations.
- **Real Estate.** The ILDNR must provide the appropriate interest in all lands required for the construction, operation, and maintenance of the Project.
- **Aesthetics.** Features should be designed to minimize negative impacts to aesthetics.

H. Criteria for Potential Enhancement Features. Table 2 presents general and specific criteria developed to assess potential Project features.

Table 1. Project Goals, Objectives, and Potential Enhancement Features

Goal	Objective	Potential Features
Restore Wetland Habitat	Increase the areal coverage as measured in acres of annual emergent and moist soil vegetation in Big Lake and Goose Lake during the summer growing season. Decrease summer water levels to below 440 in Big Lake, Goose Lake, and Rice Lake in order to promote vegetation growth during the summer growing season (Target is to achieve this condition 5 years of every 10)	Construct pump station with conveyance ditches Construct low perimeter spillway around Big Lake and Goose Lake
Restore Aquatic Habitat	Increase connectivity between Big and Rice Lakes and the Illinois River during summer draw downs in order to reduce fish mortality and avian botulism. Increase year-round flowing side channel habitat areas within the project area to provide habitat for fish and other aquatic species.	Provide access from Rice Lake to deepwater areas in the quarry Provide access from Goose Lake to the Illinois River Dredge Senate Island. side channel
Restore Floodplain Habitat	Increase areal coverage in acres of year-round floodplain forest and wetland vegetation on Duck Island agricultural fields to provide scarce habitat for wildlife.	Establish mast tree and native herbaceous plantings on Duck Island

Table 2. Development Criteria for Potential Enhancement Features

ITEM	PURPOSE OF CRITERIA
A. General Criteria	
Locate and construct features consistent with EMP directives (completeness)	
Construct features consistent with Federal, state, and local laws (acceptability)	Comply with program authorities
Develop features that can be monitored (effectiveness)	Comply with environmental laws
Design features to facilitate OMRR&R (efficiency)	Provide baseline for Project effects(e.g., sedimentation, stability, water quality)
Locate and construct features consistent with best planning and engineering practice (efficiency)	Minimize OMRR&R costs
B. Restore Wetland Habitat	
Provide reliable source of water adequate to manage water levels over entire Project area	Provide water level control over the rapid rise and fall of water levels consistent with management goals
Eliminate or reduce rapid water level fluctuations during the growing season	Increase water level control capability beyond simple gravity flow dependent on river stage
Increase flexibility of water level management capability within Project area	Increase success rate of management plan implementation
C. Restore Aquatic Habitat	
Provide fish egress from Rice Lake to deep ($\geq$ 6' year-round) aquatic areas	Increase fish survival during drawdown periods and reduce potential for avian botulism outbreak
Design water control infrastructure to preserve and if practicable, enhance seasonal fish access between Big Lake and IWW	Maintain connectivity between main channel of IWW and floodplain aquatic habitats
D. Restore Floodplain Habitat	
Locate plantings in existing agricultural areas on Duck Island; plant multiple species of native woody and herbaceous vegetation	Increase quantity and quality of native bottomland hardwood and native wet meadow habitat within Project area
Locate plantings on higher elevations within floodplain	Maximize survival rate and facilitate growth of plantings
Configure plantings in large single cover tracts	Reduce future habitat fragmentation

4. POTENTIAL PROJECT FEATURES

This section discusses potential features that will meet the goals of restoring wetland, aquatic, and floodplain habitat. Potential features were evaluated based on their ultimate contribution to the Project goals and objectives, engineering considerations, and local restrictions or constraints. Features that were determined not feasible or did not meet the criteria of table 2 were not subject to further evaluation and can be found on plate 5. Once the initial screening was completed, the remaining potential enhancement features were incrementalized and combined, where feasible, to formulate alternatives that fully or partially satisfy the Project goals and objectives (plate 4). For planning purposes, the period of analysis was 50 years.

While this report does not include detailed evaluation of a non-structural alternative, consideration was given to changing the current management plan of the unit early in the process. The PDT determined there was no potential to realize more benefits in Rice Lake by changing the existing management plan. Additionally, there is no existing capability to manage the water levels in Big Lake and Goose Lake due to an open connection to the river. It is estimated that natural conditions are right for vegetation growth in these areas not more than 1 in 10 years. The current management of the site is constrained by the lack of protection from summer high water pulses that kill off vegetation in the lakes.

A. Potential Features to Restore Wetland Habitat. The following features were considered for inclusion in this HREP to contribute to the goal of restoring wetland habitat: construction of a perimeter water control spillway around Big Lake; and construction of a new pump station for interior water level management. Details of these features are:

1. Improved Water Level Control (Perimeter Spillway). This feature would involve construction of a low-level perimeter spillway around Big Lake and Goose Lake to protect this area from midsummer river stage fluctuations that currently prevent reliable implementation of the ILDNR's management plan and limit the quality and availability of habitat for migratory waterbirds. The spillway would be aligned to take full advantage of natural ground elevations on the east side of the lake and existing remnants of the Hate Levee (plate 3) to the south to minimize ground disturbance and reduce construction costs. The top elevation of the spillway would be optimized to allow control of interior water levels to meet management goals while maintaining connectivity between the Project area and the IWW. The spillway design would include an armored section where it crosses Goose Lake, to protect against overtopping flood damages and wind induced wave action. To allow maximum flexibility and to keep the O&M cost of the Project down, the design will include a gravity flow (gatewell) structure installed through the spillway at the southwest corner of Goose Lake (plate 6).

2. Improved Water Management Capability (Pump Station). A new pump station is proposed as shown on plate 6. This feature would allow reflooding of the area in the fall, providing access to important food resources and feeding areas for migrating waterfowl. Construction of interior ditches also would be required to convey the water between the pump station and interior areas.

Three potential sources of water were initially considered in developing the pump station feature: the Duck Island quarry, Duck Creek, and the IWW. Geotechnical investigations (borings) resulted in the determination that the quarry would not be a feasible source of water due to the degree of hydraulic

connection between the lakes (plates 31 through 34). Diversion of water from Duck Creek was also investigated because of its potential low cost for construction and maintenance. However, the flow in the creek is largely controlled by outflows from a cooling reservoir for a nearby power plant. This source was not evaluated further because adequate water supply was uncertain and agreements with private entities were logistically impractical. Consequently, the IWW was evaluated as the only feasible source of water in formulating and analyzing alternative designs of the pump station.

The location of the new pump station would be chosen to allow accessible water conveyance with minimal maintenance dredging problems. Several thousand feet of discharge channel are required to convey the water to and from the lakes. The discharge channel would be constructed by a combination of mechanical excavation and embankment placement. Water control structures would be constructed at the upstream end of the Project along the new discharge channel. These structures would provide water to the Voorhees Unit, Big Lake, and Rice Lake. Water control structures would also be installed to maintain connectivity between Upper Slim Lake and Lower Slim Lake. Two options were considered to optimize the pump station feature.

> **Option 1.** The existing 50,000-gpm pump station would remain to supply Rice Lake, and a new 50,000-gpm pump station would be constructed upstream from the old Copperas Creek Lock to supply Big Lake. This alternative meets the objective of providing control over the water levels on both lakes. However, the inlet channel to the existing pump station is a 3,900-foot channel from the IWW that requires maintenance dredging approximately once every three years. Adjacent dredged material placement has become an increasing problem. The total excavation for the discharge channel would be reduced, but the sedimentation problem in the existing channel supplying Rice Lake would not be eliminated.
>
> **Option 2.** The existing 50,000 gpm pump station would be abandoned. A new pump station would be constructed upstream from the old Copperas Creek Lock. The new pump station would have a capacity of 133,200 gpm to fill both Rice Lake and Big Lake. This alternative meets the objective of providing control over the water levels on both lakes. The station would also be located close to the Illinois River to avoid maintenance costs associated with an inlet feeder channel.

B. Potential Features to Restore Aquatic Habitat (Fish Access). The following features intended to restore aquatic habitat were considered for inclusion in this Project.

1. Rice Lake to Quarry Access. This feature would involve construction of a fish passage structure between Rice Lake and the quarry at the downstream end of the Duck Island peninsula. The structure would be designed to operate during periods when water levels on Rice Lake are being lowered, to allow fish in Rice Lake to move into the deeper water of the quarry and escape the potentially lethal aquatic conditions that may occur in Rice Lake during the summer drawdown period. Access between Big Lake and the quarry already exists, so no similar structure was considered necessary for fish passage between the quarry and Big Lake.

2. Rice Lake to Quarry and Goose Lake to Illinois Waterway Access. This feature would involve construction of a fish passage structure between Goose Lake and the IWW and would be in addition to Option 1. The structure would be designed to facilitate movement of fish between Goose Lake and the IWW when water levels on Big Lake are being lowered to drawdown elevation.

3. Senate Island Side Channel Restoration. This feature would involve excavation of the IWW side channel between Senate Island and the Rice Lake SFWA. This side channel has silted in over time and provides only limited aquatic habitat value at present. The relatively high value of side channel aquatic habitat for fish and the current scarcity of such habitat on the IWW suggests that such a feature could potentially provide substantial fisheries benefits. In addition, material excavated from the channel could potentially be used as borrow material for construction of the perimeter spillway. However, the material filling the channel consists of silt along with a large amount of timber and other debris. The quantity of suitable borrow material potentially available from the side channel was estimated to be less than half the quantity required for construction of the perimeter spillway. The Senate Island side channel is also outside the Project area, partially privately owned, and restoration would require the cooperation of a willing seller and necessary real estate interest. For these reasons, this feature was determined not feasible at this time and therefore was not evaluated in detail for this Project, although it could be considered as a future habitat restoration proposal for construction either under EMP or other ecosystem restoration authorities.

4. Island Building. Although not tied directly to the fish access objective, the construction of four islands, two in Rice Lake and two in Big Lake, to reduce the resuspension of sediments from wave action was considered. This feature was not evaluated in detail due to cost of construction, the limited habitat benefits it would provide, and no direct tie to a Project objective.

C. Potential Features to Restore Floodplain Habitat. Reestablishment of native plant species on the agricultural field located on the recently acquired Duck Island property was considered for inclusion in this Project. The Rice Lake SFWA is currently dominated by two cover types - open water and wet floodplain forest. This feature would provide additional floodplain habitat diversity and would aid the ILDNR in meeting their secondary management objectives listed in section 3, paragraph D.

1. Partial Conversion of Duck Island Agricultural Fields to Native Cover Types/Conversion to Single Native Cover Type. Initial planning of this feature evaluated the feasibility of converting only half of the agricultural field acreage and continuing row crop cultivation on the remaining half, or converting the entire acreage to a single cover type (forest or native wet meadow). Following acquisition of the Duck Island property by the ILDNR, coordination within the interagency team revealed that conversion of only half of the agricultural field, or conversion of the entire agricultural field to native wet meadow habitat, would not be compatible with the restoration objectives for the site. Additionally, conversion of the entire agricultural field to forest cover would not be compatible with the need to protect several historic properties identified during cultural resources surveys of the site (see section 2.H.). For these reasons, the alternatives described in this paragraph were subsequently determined not to be feasible and therefore were not included in the incremental analysis of planting alternatives.

2. Conversion of All Duck Island Agricultural Fields to Native Cover (Mast Trees and Wet Meadow). The entire agricultural field acreage of Duck Island would be converted to a combination of forest and wet meadow cover types featuring plant species historically native to the Project area. Restoration of grassland habitat within the Rice Lake SFWA would involve planting a mixture of native wet-mesic herbaceous species on a portion of Duck Island's agricultural field to protect historic properties identified during cultural resources surveys. Restoration of floodplain forest habitat with a substantial component of mast-producing tree species would involve planting a mixture of native tree species (primarily hard mast species such as oaks and pecan) on the remaining agricultural field acreage

5. EVALUATION OF FEASIBLE PROJECT FEATURES AND FORMULATION OF ALTERNATIVES

This section describes features that met the goals and objective of this Project. Each feature was evaluated to determine its potential for environmental restoration and enhancement. Cost estimates were also derived for each of the feasible alternatives.

A. Environmental Output Evaluation. A habitat analysis was conducted to assess environmental outputs (benefits) of the proposed Project. This analysis employed a multi-agency team approach with participation by resource managers and biologists representing the Corps, the USFWS, and the ILDNR. This multi-agency team assessed existing Project area conditions, projected future without-project conditions, and expected impacts of proposed Project features and alternatives. The team utilized the Wildlife Habitat Appraisal Guide (WHAG), a numerical habitat appraisal system based on USFWS Habitat Evaluation Procedures (HEP) (1980) developed by the Missouri Department of Conservation and the Soil Conservation Service.

The WHAG procedures evaluate the quality and quantity of particular habitats for animal species selected by the WHAG team members. The qualitative component of the analysis is known as the Habitat Suitability Index (HSI) and is rated on a 0.1 to 1.0 scale. The quantitative component of the WHAG analysis is the measure of acres of habitat that are available for the selected evaluation species. From the qualitative and quantitative determinations, the standard unit of measure, the Habitat Unit (HU) is calculated using the formula (HSI x Acres = HUs). Changes in HUs will occur as a habitat matures naturally or is influenced by development. These changes influence the cumulative HUs derived over the life of the Project. Cumulative HUs are annualized and averaged to determine Average Annual Habitat Units (AAHUs). Average Annual Habitat Units are used as the output measurement to compare all the features and alternatives for the proposed Project.

The WHAG analysis evaluated the effects of proposed Project features on habitat availability and quality for 23 wildlife and fish species. Seven species (mallard, Canada goose, least bittern, king rail, lesser yellowlegs, green-backed heron, and muskrat) were used to assess the effects of the spillway and pump station features. Seven fish species (channel catfish, crappie, largemouth bass, bluegill, gizzard shad, carp, and black bullhead) were used to evaluate the fish access structures. Nine wildlife species (white-tailed deer, wild turkey, bobwhite, eastern cottontail, fox squirrel, eastern bluebird, wood thrush, Kentucky warbler, and indigo bunting) were used to evaluate native forest and wet meadow/grassland restoration. A detailed description of the habitat analysis is provided in Appendix D, *Habitat Evaluation and Quantification*.

B. Feasible Project Features. Plate 4, *Project Features Evaluated,* shows the locations of all feasible Project features described in section 4. Project feature alternatives were identified and evaluated by the interagency team to aid in development of a recommended plan. These alternatives are described as follows:

1. Perimeter Water Control Spillway (L) A low-level perimeter spillway around Big Lake and Goose Lake would protect the area from midsummer river stage fluctuations that currently prevent reliable implementation of the ILDNR's management plan and limit the quality and availability of habitat for migratory waterbirds. This feature is combinable with feature P.

a. No Action (L0). No action would result in no additional water control efforts. No AAHU gain or loss would be realized other than what may occur naturally. If no action is taken, it is anticipated that uncontrolled water level fluctuations will continue to substantially limit the habitat value of wetlands in the Project area, particularly in Big Lake.

b. Spillway at Elevation 440.0 (L1). This alternative would involve constructing a perimeter water control spillway with a top elevation of 440.0 and a gatewell structure. Gravity drawdown of the Project area could occur and be maintained while river stage is below elevation 440.0. This alternative would provide protection to Big Lake and a slight increase in operating flexibility for the Rice Lake portion of the Project (Narrows Dam between the lakes has a top elevation of 439.0). This feature yields a net benefit of 2,293 AAHUs with no additional pumping capacity (P0), 4,012 AAHUs with additional pumping capacity for Big Lake only (P1), and 6,369 AAHUs with additional pumping capacity for Big Lake and Rice Lake (P2)

2. Pump Station and Conveyance Facilities (P). This feature would allow reflooding of the area in the fall, providing access to important food resources and feeding areas for migrating waterfowl. Construction of interior ditches also would be required to convey the water between the pump station and interior areas. Feature P is dependent on feature L discussed previously.

a. No Action (P0). No action would result in no additional water level management capability. No AAHU gain or loss would be realized other than what may occur naturally. If no action would be taken, it is anticipated that uncontrolled water level fluctuations will continue to substantially limit the habitat value of wetlands in the Project area, particularly in Big Lake.

b. Pumping Facility for Big Lake (P1). This alternative would involve construction of a 50,000 gpm pump station, a 4,200-foot discharge channel, and water control structures to fill Big Lake. The existing pump station would remain to supply Rice Lake. This alternative would provide the capability to manipulate water levels on Big Lake, while separately maintaining existing water level management capabilities on Rice Lake.

c. Pumping Facility for Big Lake and Rice Lake (P2). This alternative would involve abandoning the existing Rice Lake pump station, and constructing a 133,200 gpm pump station, a 7,000-foot discharge channel, and water control structures to fill Big Lake, Rice Lake, and the Voorhees Unit. The existing pump station would be abandoned and its function transferred to the new pumping station. This alternative would also provide the capability to manipulate water levels on Big Lake, while maintaining existing water level management capabilities on Rice Lake.

3. Fish Access (F) This feature is designed to operate during periods when water levels are being lowered (summer drawdown) to allow fish to move into deeper water areas and escape potential lethal aquatic conditions.

a. No Action (F0). No action would result in no increase in fish access between Rice Lake and the deepwater areas of the Duck Island quarry, and no increase in fish access between Big Lake and the IWW. No AAHU gain or loss would be realized other than what might occur naturally.

b. Rice Lake to Quarry Access (F1). This alternative would involve constructing a single 9-foot by 7-foot reinforced concrete box culvert with a stoplog structure to allow fish access between Rice Lake

and the Duck Island quarry. Because a connection between Big Lake and the quarry already exists, this alternative would affect only Rice Lake. Access between the entire SFWA and the IWW would be unaffected. This feature yields a net benefit of 2,329 AAHUs.

c. Rice Lake to Quarry and Goose Lake to IWW Access (F2). This alternative would involve constructing the Rice Lake-quarry access described above and also constructing a second 9' by 7' reinforced concrete box culvert with a stoplog structure between Goose Lake and the IWW that would function both as a gravity drain and fish access for the entire SFWA during the summer drawdown. This feature yields a net benefit of 5,501 AAHUs.

4. Duck Island Native Vegetation Plantings (T) Reestablishment of native plant species on the agricultural field on Duck Island would provide floodplain habitat diversity, improve the quality and quantity of forest habitat, and reduce forest fragmentation.

a. No Action (T0). No action would result in no change in existing land cover or land use practices on Duck Island. Assuming continuation of Duck Island's current agricultural use, no AAHU gain or loss would be realized for the 548-acre site.

b. Conversion of Agricultural Fields to Forest and Native Wet Meadow/Grassland Cover (T1-T5). These alternatives involve conversion of Duck Island agricultural fields to native forest and grassland cover through active planting of native vegetation, in varying proportions described as follows:

(T1) 352 acres wet meadow/grassland, 57 acres forest, 594 AAHUs
(T2) 272 acres wet meadow/grassland, 137 acres forest, 604 AAHUs
(T3) 204 acres wet meadow/grassland, 205 acres forest, 611 AAHUs
(T4) 137 acres wet meadow/grassland, 272 acres forest, 619 AAHUs
(T5) 57 acres wet meadow/grassland, 352 acres forest, 629 AAHUs

C. Cost Estimates for Habitat Improvement Measures. Table 3 shows the estimated outputs and annualized costs for each feature alternative. The annualized costs are based on estimates for construction, real estate, monitoring, and OMRR&R. A detailed breakdown of costs for the Recommended Plan is outlined in section 8, *Cost Estimates*.

Table 3. Environmental Output and Costs of Each Feature

Feature	Symbol	Output [1]	Annualized Cost in $ [2]
Perimeter Spillway			
No action	L0	0	0
Spillway 440, no pump	L1+P0	2293	124,000
Spillway 440, Big Lake pump only	L1+P1	4012	369,000[3]
Spillway 440, Big/Rice Lake pump	L1+P2	6369	425,000
Fish Access Structures			
No Action	F0	0	0
Passage from Rice Lake to Duck Island quarry pit	F1	2329	14,500
Passage from Rice Lake to Duck Island quarry pit and from Big Lake to IL River	F2	5501	24,000
Duck Island Native Vegetation Planting			
No action	T0	0	0
352 acres wet meadow/grassland, 57 acres forest	T1	594	47,000
272 acres wet meadow/grassland, 137 acres forest	T2	604	51,000
204 acres wet meadow/grassland, 205 acres forest	T3	611	54,000
137 acres wet meadow/grassland, 272 acres forest	T4	619	56,000
57 acres wet meadow/grassland, 352 acres forest	T5	629	60,000

[1] Outputs are calculated as Average Annual Habitat Units (AAHUs).
[2] Annualized cost includes initial construction, real estate, monitoring, and OMRR&R costs based on a 50-year Project life, 4⅜ % interest rate.
[3] For this feature (L1+P1), annualized costs are not included for OMRR&R of the existing pump station as they are a part of the ILDNR's existing responsibilities.

D. Incremental Analysis of Project Alternatives. Cost effectiveness and incremental cost analysis (CE/ICA) was used to assist the process of determining what Project features and design alternatives should be built based on comparison of quantified habitat benefits (outputs) and estimated costs of alternative feature designs. This process identifies alternative features or combinations of features that partially or fully meet the goals and objectives of the Project and at the same time are the most cost effective. A cost effectiveness analysis is conducted to ensure that least cost alternatives are identified for various levels of output. After the cost effectiveness of the alternatives has been established, subsequent incremental cost analysis is conducted to reveal and evaluate changes in cost for increasing levels of environmental output.

CE/ICA is basically a three-step procedure: (1) calculate the environmental outputs of each feature; (2) determine a cost estimate for each feature; and (3) combine the features to evaluate the best overall Project alternative based on habitat benefits and cost. A detailed description of habitat evaluation and benefit quantification is provided in Appendix D, *Habitat Evaluation and Quantification*. Costs were annualized by applying a 4⅜ percent interest rate to the construction cost over the period of analysis, of 50 years for planning purposes. The incremental analysis of alternatives was accomplished following guidance prepared by the Corps' Institute for Water Resources and using the methodology described in Robinson, *et al*. (1995).

Primary assumptions and constraints used in conducting CE/ICA for this HREP are as follows:

1. AAHUs for all analyzed fish and wildlife species were assumed to have equal value in comparing alternative plans.

2. Alternatives analysis was limited to combinations that at least partially met all three Project objectives listed in table 1.

3. Feature P (pump station) was assumed to be dependent on Feature L (perimeter spillway). Because both the perimeter spillway and pump station address the Project goal of restoring wetland habitat, alternatives that included P0 were included in the CE/ICA analysis provided they also met the conditions of assumption number 2 above.

A total of 61 plans were evaluated (out of a total of 162 possible combinations). Of these, 26 plans (including the No-Action alternative L0+P0+F0+T0) were identified as being cost-effective using CE/ICA analysis. These plans are listed in table 4 and displayed in figure 3.

Incremental cost analysis identified six of the above plans as "Best Buy" plans, defined as those cost-effective plans which provide the greatest incremental increase in output (benefits) for the lowest incremental increase in cost. These "Best Buy" plans are listed in table 5 and displayed in figure 4.

Table 4. Cost-Effective Alternative Combinations

Plan Alternative	Annualized Cost ($)	Outputs (AAHU)	Average Cost ($/AAHU)
L0P0F1T0	14000	2329	$6.01
L0P0F2T0	24000	5501	$4.36
L0P0F2T1	71000	6095	$11.65
L0P0F2T2	75000	6105	$12.29
L0P0F2T3	78000	6112	$12.76
L0P0F2T4	80000	6120	$13.07
L0P0F2T5	84000	6130	$13.70
L1P0F2T0	148000	7794	$18.99
L1P0F2T1	195000	8388	$23.25
L1P0F2T2	199000	8398	$23.70
L1P0F2T3	202000	8405	$24.03
L1P0F2T4	204000	8413	$24.25
L1P0F2T5	208000	8423	$24.69
L1P1F2T0	393000	9513	$41.31
L1P1F2T1	440000	10107	$43.53
L1P1F2T2	444000	10117	$43.89
L1P1F2T3	447000	10124	$44.15
L1P2F2T0	449000	11870	$37.83
L1P2F2T1	496000	12464	$39.79
L1P2F2T2	500000	12474	$40.08
L1P2F2T3	503000	12481	$40.30
L1P2F2T4	505000	12489	$40.44
L1P2F2T5	509000	12499	$40.72
No Action Plan	0	0	0

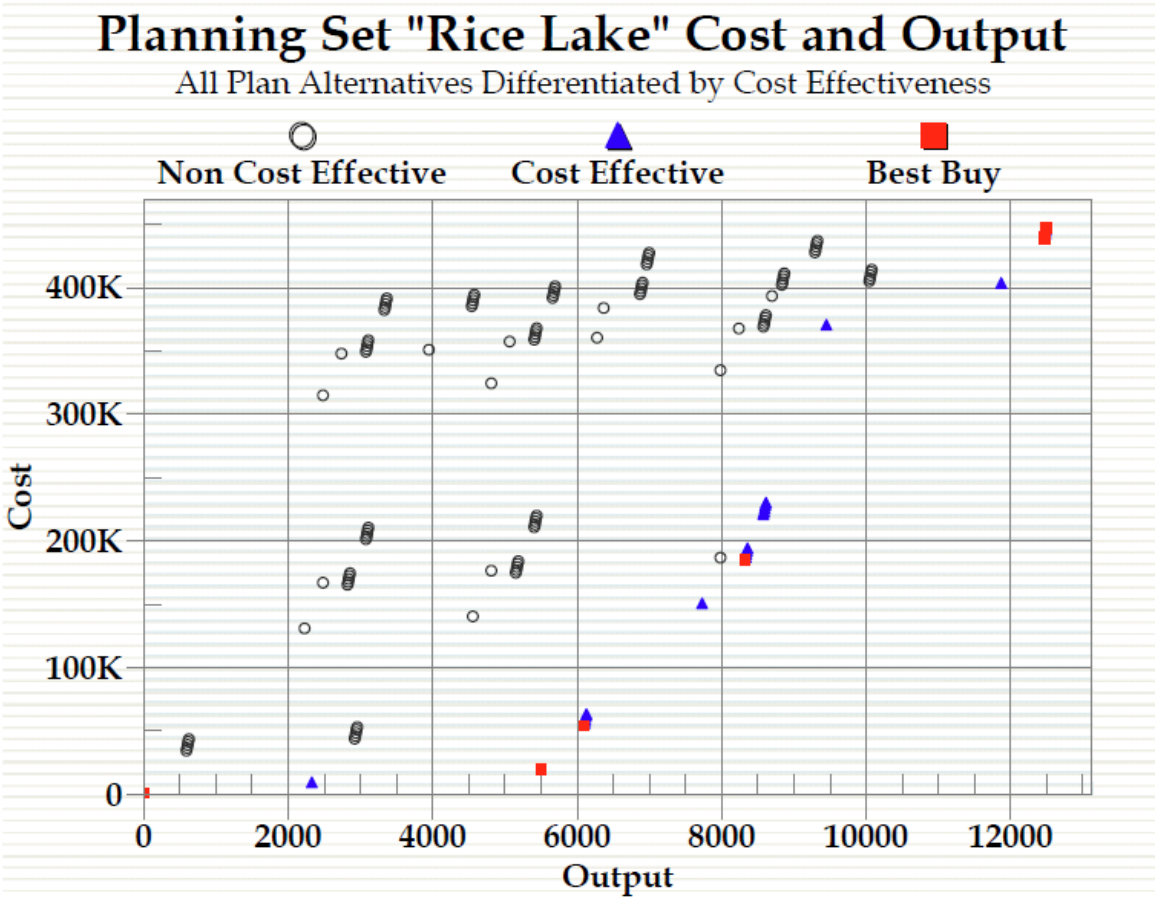

Figure 3. Cost Effectiveness of Alternatives

Table 5. "Best Buys" of Cost-Effective Alternative Combinations

Plan	Annualized Cost ($)	Outputs (AAHU)	Average Cost ($/AAHU)	Incremental Output (AAHU)	Incremental Cost ($)	Incremental Cost/Output ($/AAHU)
No Action Plan	0	0	$0	0	$0	$0.00
L0P0F2T0	24000	5501	$4.36	5501	$24,000	$4.36
L1P0F2T0	148000	7794	$18.99	2293	$124,000	$54.08
L1P2F2T0	449000	11870	$37.83	4076	$301,000	$73.85
L1P2F2T1	496000	12464	$39.79	594	$47,000	$79.92
L1P2F2T4	505000	12489	$40.44	25	$9,000	$360.00
L1P2F2T5	509000	12499	$40.72	10	$4,000	$400.00

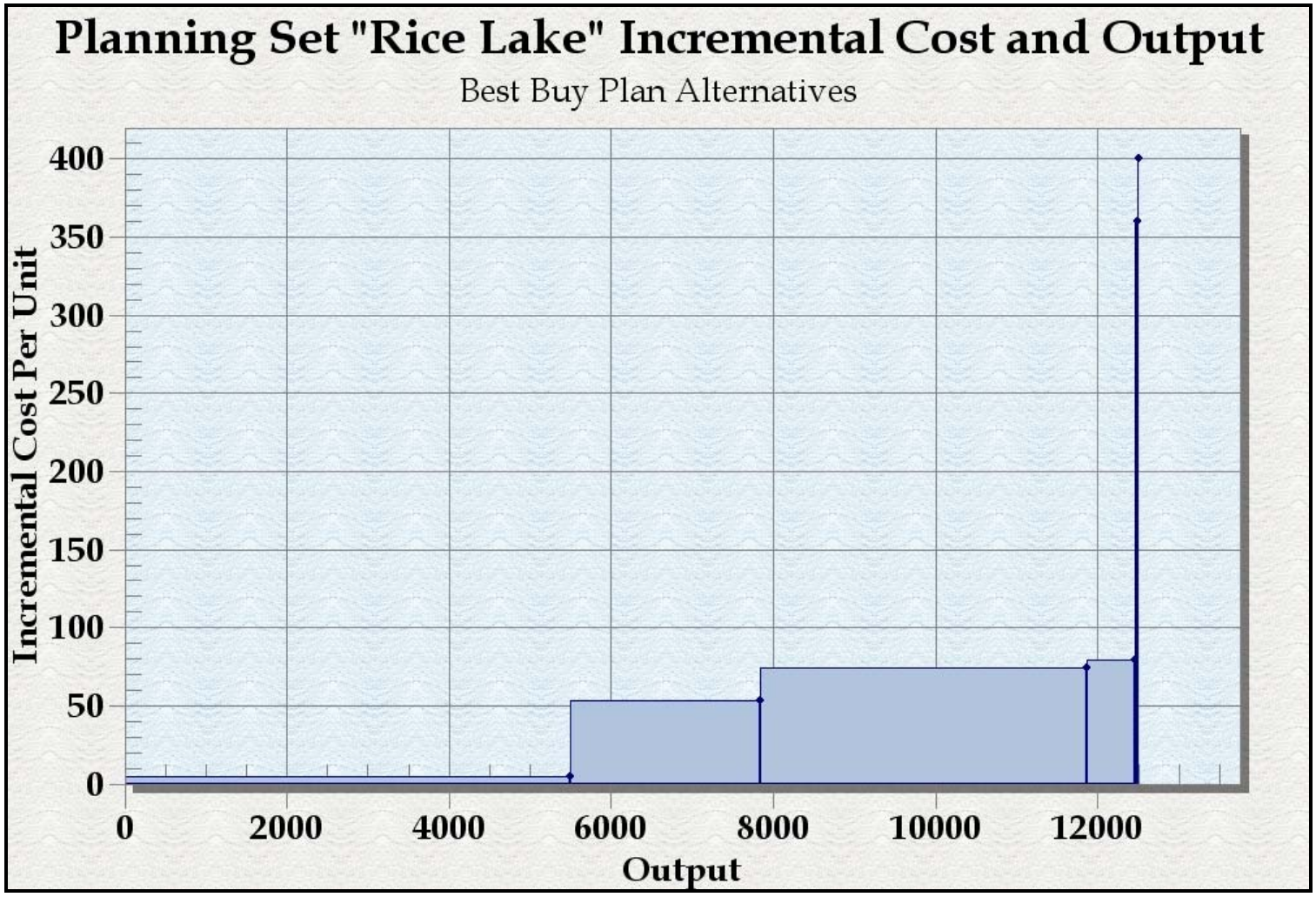

Figure 4. Rice Lake "Best Buy" Plans

E. Plan Selection. Federal planning for water resources development is conducted in accordance with the requirements of the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*. As part of identifying the Recommended Plan, a number of alternative plans were developed and compared with the "No Action" alternative, allowing for the ultimate identification of the National Ecosystem Restoration (NER) Plan. The NER Plan reasonably maximizes ecosystem restoration benefits compared to costs, considering the cost effectiveness and incremental cost of implementing other restoration options. In addition to considering the system benefits and costs, it also considers information that cannot be quantified such as environmental significance and scarcity, socioeconomic impacts, and historic properties information.

The information developed by CE/ICA will assist in making informed decisions and, once a decision is made, will help in better understanding its consequences in relation to other choices. However, this procedure should not be the sole source of information on which to base a decision. Other factors considered in this analysis were landscape of the site (including physical dynamics associated with the large river-floodplain ecosystem), management objectives of the resource agencies, critical needs of the region, and ecosystem needs of the UMRS.

The question posed to the interagency team involved in this analysis was, "Is the cost of the added increment in output worth the added costs?" The Rice Lake HREP team concluded that the alternative plan that best meets the goals and objectives of each agency and the EMP program is L1P2F2T5 (perimeter spillway at elevation 440.0, new pumping capacity for Big Lake and Rice Lake, fish access to Duck Island quarry and the IWW, and conversion of Duck Island agricultural fields to 352 acres native forest and 57 acres native wet meadow/grassland). This alternative is cost-effective and justified as a "Best Buy" plan. While the other cost-effective alternatives evaluated for this Project would partially address the goals and objectives of the Project, the consensus of the interagency team was that this alternative would reasonably maximize ecosystem restoration benefits for the greatest diversity of resident and migratory species, and that other cost-effective alternatives would be less effective in meeting project objectives.

In addition, this alternative would maximize the rare opportunity to restore a critical functional component of the floodplain ecosystem (mast-producing trees) on public lands by re-establishing a large (352 acres), self-sustaining contiguous tract of this cover type within the Rice Lake SFWA. Establishment of such a large tract of mast-producing trees would also enhance the overall quality of existing floodplain forest throughout the SFWA and the surrounding vicinity, and the ecosystem services provided by this alternative would be expected to extend beyond the 50-year planning life. For these reasons, L1P2F2T5 is identified as both the NER Plan as well as the NFS's preferred plan.

The tentatively selected plan addresses all three of the identified key problems: decreased reliability of seasonal food and cover for migratory birds, loss of fish access to deep aquatic habitat during low water periods, and decreased acreage and diversity of native floodplain vegetation as habitat for resident and migratory wildlife. The perimeter spillway Project feature increases native floodplain vegetation acreage by allowing water level management on approximately 700 acres that were previously uncontrolled and unprotected. The perimeter spillway, in conjunction with the pump station Project feature, will improve the success rate of seasonal food and cover plants from 1 in 10 years to 4 in 10 years by allowing timely filling, draining, and water elevation control. The perimeter

spillway will also stop summer water elevation spikes (up to elevation 440.0) from flooding the area and killing the young plants. The mast tree and native herbaceous planting features will restore and diversify the native floodplain vegetation by converting 409 acres of row crops on Duck Island to native mast tree-dominant forest and wet meadow cover types. The two fish egress structures will restore access to deeper aquatic habitat during low water periods by allowing fish to move from Rice Lake into the Quarry and then to the IWW via Big and Goose Lakes. The fish in Big and Goose lakes could move directly to the IWW.

6. TENTATIVELY SELECTED PLAN: DESCRIPTION WITH DESIGN, CONSTRUCTION, OPERATION, AND MAINTENANCE CONSIDERATIONS

The tentatively selected plan for habitat rehabilitation and enhancement of the Rice Lake SFWA includes a Perimeter Water Control Spillway (L1); Pump Station and Conveyance Facilities (P2); Fish Access (F2), and Duck Island Native Vegetation Plantings (T5). The details of this plan are described below and illustrated on plate 6.

A. Perimeter Water Control Spillway (L1). This feature consists of a spillway, approximately 24,050 feet long, and a 60-inch gatewell structure. These structures would be designed to provide protection from low level summer flooding 4 out of 10 years, which would allow for moist soil plant production to benefit resident and migratory waterfowl.

The proposed perimeter water control spillway would be aligned to take full advantage of natural ground elevations on the east side of Big and Goose lakes and existing remnants of the Hate Levee to the south, which would minimize ground disturbance and reduce construction costs (see plates 7 through 17). The spillway would be constructed to elevation 440 feet NGVD, which corresponds to approximately a five-year level of protection, using adjacent clay material or clay material dredged from Goose Pond (22,000 cubic yards). The spillway slopes would be a minimum 3 horizontal feet (run) on 1 vertical foot (rise) (3:1). The spillway would be armored near the downstream end using riprap (25,000 tons) placed on both side slopes and the crown.

A new 60-inch gatewell structure would be installed adjacent to the two existing gatewell structures. The new gatewell would consist of reinforced concrete piping and an interior sluice gate (plate 18).

B. Pump Station and Conveyance Facilities (P2). A new 133,200 gpm pump station and conveyance system would be constructed to allow for water management of Rice Lake, Big Lake, Goose Lake, and the Voorhees Unit.

Four 33,300 gpm pumps would be installed, as shown on plates 28, 29, and 30. Four smaller pumps were selected over larger pumps because of their reduced power requirements, greater management flexibility, and reduced operating expenses. The pump station building would be a weather-tight, vandal-resistant concrete structure. The intakes to the pump station would have steel trash racks and bulkheads to protect the pump from debris and sedimentation.

Seven thousand feet of clearing, grubbing, and channel excavation would be completed to convey the water between the pump station and the Project's lakes (plates 21 and 22). The channel would be between an existing road embankment (on the southern side) and a newly constructed berm on the opposite side. The berm would be constructed from the channel excavation material with a top elevation of 440 feet NGVD, side slopes of 3:1, and a top width of 10 feet (minimum). The channel would have a bottom elevation of 430 feet NGVD and side slopes of 3:1. There would be a 10-foot buffer between the top bank of the channel and the toe of both the existing berm and the new berm.

Water control structures would be constructed along the new discharge channel (plates 23 to 27). Two 24-inch CMP stoplog structures and three 48-inch CMP stoplog structures would be installed to provide water to the Voorhees Unit and Big Lake, respectively. Three additional 48-inch CMP structures would be installed to connect the new discharge channel to the existing channel that leads to Rice Lake. In order to maintain connectivity between the upper and lower portions of Slim Lake, two water control structures (one going from the new discharge channel into upper Slim Lake and the other to the lower portion of Slim Lake) will be installed. These two structures will be prefabricated Agridrain ® or similar type structures.

C. Fish Access (F2). Two reinforced concrete fish egress structures will be constructed as shown on plates 19 and 20. These structures will be designed to provide passage of fish from Rice Lake and Goose Lake to the quarry and the IWW, respectively, during drawdown periods.

These fish egress structures will be 9 feet wide inside reinforced concrete structures able to support vehicular traffic. A stoplog structure will be included on the Rice Lake side and the IWW side of the two structures. Both stoplog structures will have two bays to minimize length of stoplogs thus minimizing efforts for installation and removal of stoplogs. The invert elevations of both structures will be 430-foot NGVD. Structures will be constructed and designed such that the substrate of the fish egress is consistent with the surrounding substrate.

D. Duck Island Native Vegetation Plantings (T5). Approximately 409 acres will be planted in mast-producing trees and native herbaceous species. The site of the planting will be the agricultural areas on Duck Island. Mast-producing tree plantings will occur on approximately 352 acres of the site. Pin oak, swamp white oak, bur oak, northern pecan, hackberry, black cherry, shingle oak, Kentucky coffee tree, persimmon, red oak, shellbark hickory, and black walnut will be planted in approximate 100 acre increments over a 4-year period. Species will be intermixed to avoid solid blocks of individual species (monoculture).

Bare root seedlings approximately 12 to 24 inches in height will be planted. Trees will be planted on a 10-foot x 10-foot maximum spacing (=435 trees/acre). Species will be planted according to suitable site location on Duck Island (based on soils maps) and well mixed within planting rows. Following a three-year establishment period, the surrounding ground in all mast-tree planting areas will be allowed to assume natural growth.

Establishing the approximately 57 acres of wet meadow on Duck Island will require tilling and seeding the area with a native herbaceous mixture. Native herbaceous species will be selected based on their historical range, their affinity for open, somewhat sandy conditions, and their ability to

withstand some flooding. Candidate species may include, but will not be limited to, big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), side oats grama (*Bouteloua curtipendula*), and Virginia wild rye (*Elymus virginica*). Some areas will require clearing of recent growth. Weed control will be required until the preferred vegetation becomes well established. This can be accomplished through a combination of herbicides, mowing, and seasonal burning as appropriate.

Seeding will begin in the spring no earlier than March 15 and will be completed no later than May 5. If planted in the fall, starting and ending dates will be October 1 and November 15, respectively. Species will be intermixed to avoid solid blocks of individual species (monoculture).

E. Project Summary. Table 6 summarizes Project data.

Table 6. Rice Lake HREP Feature Summary

Feature	Measurement	Unit of Measure
Perimeter Water Control Spillway		
Length	24,050	ft
Top Elevation	440	ft NGVD
Crown Width	10	ft
Side Slopes	3:1	H:V
Embankment	22,000	cy
Armored Spillway Section		
Length	2,500	ft
Top Elevation	440	ft NGVD
Riprap	25,000	tons
Side Slopes: Interior	3:1	H:V
Gatewell Structure		
Number	1	ea
Diameter	60	In
Length	100	ft
Invert Elevation	430	ft NGVD
Slide Gates	1	ea
Pump Station		
Pumps		
Number	4	ea
Flow	33,300	gpm
Riverside Sill Elevation	419	ft NGVD
Landside Sill Elevation	430	ft NGVD
Trash Rack	1	ea
Slide Gate	4	ea
Discharge Pipe		
Number	4	ea
Diameter	42	in
Length	400	ft

Feature	Measurement	Unit of Measure
Discharge Channel		
Length	7,000	ft
Berm Top Elevation	440	ft NGVD
Channel Bottom Elevation	430	ft NGVD
Channel Bottom Width	30	ft
Side Slopes	3:1	H:V
Clearing/Grubbing	25	ac
Excavation	100,000	cy
Water Control Structures		
Voorhees Unit (CMP)	2	ea
Diameter	24	in
Riprap	14	ton
Slim Lake (Agridrain ®)	2	ea
Diameter	24	in
Riprap	14	ton
Rice Lake (CMP)	3	ea
Diameter	48	in
Riprap	22	ton
Big Lake (CMP)	3	ea
Diameter	48	in
Riprap	22	ton
Invert Elevation (all structures)	430	ft NGVD
Average Length (all structures)	80	ft
Fish Egress Structures		
Number	2	ea
Opening Width	9	ft
Opening Height	7	ft
Approx. Length to IWW	50	ft
Approx. Length to Quarry	70	ft
Invert Elevation	430	ft NGVD
Stoplog structure	2	ea
Duck Island–Mast Tree Plantings		
Black Cherry	12,760	trees
Black Walnut	12,760	trees
Bur Oak	12,760	trees
Hackberry	12,760	trees
Kentucky Coffee Tree	12,760	trees
Northern Pecan	12,760	trees
Persimmon	12,760	trees
Pin Oak	12,760	trees
Red Oak	12,760	trees
Shellbark Hickory	12,760	trees
Shingle Oak	12,760	trees
Swamp White Oak	12,760	trees
Total Trees	**153,120**	**trees**
Annual Grains + Red Top Grass (ground cover)	352	ac
Duck Island - Native Herbaceous Plantings		
Surface Area	57	ac

F. Design Considerations

1. Existing Site Elevations. The entire Rice Lake HREP is located within the floodplain of the IWW. Flat pool elevation is 429 feet NGVD. The land surface elevation in the Rice Lake SFWA ranges from 429 to 438 feet NGVD. Big Lake, Goose Lake, Beebe Lake, and the Quarry are open to the IWW, which causes their water elevations to vary with the river stage. The Rice Lake elevation can be managed by the Narrows Dam stoplog structures, which allows for a water elevation up to 439 feet NGVD. It is anticipated that shallow borrow and subsequent embankment construction can be accomplished using traditional earth-moving equipment. Dewatering likely will be required for foundation work associated with the pump station, gatewell structure, fish egress structures, and water control structures.

2. Permits. A public notice, as required by Section 404 of the Clean Water Act, was made prior to submission of this report for final approval. A Section 401 water quality certificate will be received from the State of Illinois during the plans and specifications phase. A Section 404(b)(l) Evaluation is included in the final submission of this report (Appendix B, *Clean Water Act, Section 404(b)(1) Evaluation*). A National Pollutant Discharge Elimination System (NPDES) permit for storm water control will be required for a disturbance of an area of the size proposed for construction. This permit will be obtained by the Contractor during construction. The Clean Water Act Amendments of 1987 established the NPDES storm water program. The act called for implementation in two phases; Phase I addressed the most significant sources of pollution in storm water runoff, while Phase II addresses other sources to protect water quality. The Phase II regulations were published in the December 8, 1999, Federal Register. Beginning on March 10, 2003, construction sites that disturb one acre or more are required to have coverage under the NPDES general permit for storm water discharges from construction site activities.

3. Construction Materials. Suitable clay borrow material will be obtained from adjacent areas or from within Goose Lake. This will enhance benefits of wetland habitat obtained by construction of the perimeter water control spillway and resulting water management. Borrow for topsoil shall be obtained from strip material that is free of objectionable material or shall be trucked in.

Only common construction materials are required for this Project. Crushed stone and ready mix materials are available locally and can be trucked to the site. Riprap can be barged or trucked to the site. Construction areas are easily accessible, and construction materials can be transported on site by conventional equipment.

4. Storm Water Pollution/Erosion Control. The potential for storm water pollution during construction is minimal for this Project. Stormwater runoff from the majority of the disturbed areas will be contained within the Rice Lake SFWA. Temporary stabilization measures will be employed on disturbed areas of the perimeter water control spillway until final seeding and stabilization occurs. Stabilization practices may include mulching, temporary seeding, and/or the erection of silt fencing. Overall, the long-term storm water runoff characteristics of the site are not expected to change; all disturbed areas will be reseeded with similar vegetation types as before Project conditions.

5. Construction Sequence. The probable construction sequence is summarized in table 7. The contractor will be required to start pump station and discharge channel construction prior to initiating any of the other Project features. All construction should be accomplished within two construction seasons and adhere to any endangered or threatened species restrictions in the area. Mast tree plantings should be accomplished within four construction seasons with weed control continuing an additional three years for the last plantings.

G. Operational Considerations. Operation of water supply and water control features restores habitat for fall waterfowl migration. To that effect, the wetlands may be drained in the spring to allow establishment of vegetation, and flooded in the fall to provide resting habitat for migrating waterfowl. Controlled water level fluctuations provide a wider variety and dependable supply of food for migrating waterfowl and resident species

H. Maintenance. The proposed features have been designed to ensure low annual maintenance requirements. Routine maintenance would include periodic inspection and lubrication of the pumps and water control structures. Pumps should be exercised periodically to ensure operational readiness. The discharge channel and perimeter spillway should be routinely inspected for evidence of erosion. Debris removal along the perimeter spillway will be required. Debris and sediment removal within the discharge channel and pump station forebay will also be required every one or two years. Weed control will be required around the trees three years following the plantings. Weed control may involve mowing and/or herbicides application. Additional maintenance may be required after flood events. The estimated annual maintenance costs are presented in section 8, *Cost Estimates*. Maintenance requirements will be further detailed in the Project's Operations and Maintenance (O&M) manual published after construction is finished.

I. Value Engineering. A Value Engineering (VE) study was completed in May 2005 for this Project in accordance with ER 11-1-321, Army Programs, Value Engineering, dated 28 February 2005. The VE study recommendations have been reviewed for technical acceptance and coordinated with the Sponsor. The adopted recommendation of using adjacent borrow for the spillway section across Goose Lake has been incorporated into this DPR. A VE study was also completed in October 1998, which recommended a reduced length for the spillway and a shorter fish passage structure. These recommendations from the 1998 study have also been incorporated into this DPR. Additional opportunities to provide added value to the Project will be pursued during the development of the plans and specifications and construction phases of the Project.

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Table 7. Rice Lake HREP Probable Construction Sequence

Sequence	Construction Work Item	Instructions	Purpose
1	Install/Construct new pump station facility	Area of construction is restricted to the 100-ft wide area identified on plate 28	Construction during low water levels will minimize dewatering operations.
2	Excavate discharge channel and construct berm	Use excavated material for berm.	Maximize use of on-site materials to minimize costs.
3	Construct perimeter spillway	Clay material will be obtained from adjacent areas or from within Goose Lake.	Maximize use of on-site materials to minimize costs.
4	Armor spillway section	Use riprap to protect the portion of the spillway that crosses Goose Lake.	Provides protection from overtopping damage and wind induced wave action.
5	Install/Construct water control structures	Construct in a manner that minimizes damage to existing berms and maintains access into refuge.	This will allow habitat management and public use to continue during Project construction.
6	Plant mast trees	Trees will be planted in 100 acre increments.	Spreading plantings over four years will reduce losses from a major flood.
7	Plant native herbaceous species	Plant during dormant season (Nov 5 - Feb 5).	Sowing seeds during dormant season allows incorporation of the seed into the soil through frost heaving.

7. SCHEDULE FOR DESIGN AND CONSTRUCTION

Table 8 presents the schedule of Project completion steps.

Table 8. Project Implementation Schedule

Event	Scheduled Date
Distribute Draft DPR for Agency Review	Sep 1997
Distribute Public and Agency Review Draft DPR	Jan 2010
Submit Final DPR to Mississippi Valley Division	Jan 2011
Construction Approval by Mississippi Valley Division	Apr 2011
Approve Plans and Specifications	Jun 2011
Execute the Project Partnership Agreement	Jun 2011
Advertise Contract	Jul 2011
Award Contract	Aug 2011
Complete Construction	Dec 2014

8. COST ESTIMATES

Table 9 compares costs for the fully funded estimate (FFE) and the current work estimate (CWE) (Appendix J, *Cost Estimate*.) The FFE was calculated based on the proposed construction schedule, expected escalation costs, and a contingency factor, and represents the money expected to be spent at the end of Project construction. The CWE is shown in a detailed estimate of Project design and construction costs as presented in table 10. Quantities and costs may vary during final design. All cost estimates are calculated using present worth (October 2010).

Table 9. Project Design and Construction Cost Estimates

Account	Feature	Fully Funded Estimate[1] (FFE) ($)	Current Working Estimate (CWE) ($)
01	Lands and Damages	$7,573,000	$7,465,000
02	Relocations	0	0
06	Fish and Wildlife Facilities	$1,435,000	$1,392,000
09	Fish and Wildlife Facilities	$1,668,000	$1,618,000
13	Fish and Wildlife Facilities	$3,684,000	$3,572,000
15	Fish and Wildlife Facilities	$2,850,000	$2,763,000
30	Planning, Engineering and Design	$2,846,000	$999,000
31	Construction Management	$707,000	$660,000
Project Costs Subject to Cost Sharing		**$20,763,000**	**$18,469,000**
Non-Federal Cost [2]		**$7,267,000**	**$6,464,000**
	Estimated non-Federal Lands and Damages	$7,573,000	$7,465,000
	Required non-Federal Cash Contribution	0	0
	Excess non-Federal Lands and Damages	$306,000	$1,001,000
Federal Cost [3]		**$13,496,000**	**$12,005,000**
	Ecosystem Restoration Report	$(1,819,000)	$(1,819,000)
Remaining Federal Costs		**$11,677,000**	**$10,186,000**

1. Fully funded estimate is marked up to midpoint of construction
2. All Project features are subject to 65 percent Federal and 35 percent non-Federal cost share.
3. The Federal cost is 65% of the Project Costs Subject to Cost Sharing line less the Excess non-Federal Lands and Damages line.

Table 10. Detailed Project Cost Summary, October 2010 Price Level

Acct Code	Item	Quantity	Unit	Unit Price	Cost	Contingency	Cont. %
01	**Lands and Damages**						
	Real Estate	1	LS	$6,493,000	$6,493,000	$972,000	15%
	TOTAL Lands and Damages				**$6,493,000**	**$972,000**	
02	**Relocations**	-	-	-	-	-	-
06	**Fish and Wildlife Facilities**						
	Mob & Demob	1	LS	$12,278	$12,278	$3,524	29%
	TOTAL Mob & Demob				**$12,278**	**$3,524**	
06.10	**Fish Egress Structures**						
	Rice Lake Structure	1	LS	$157,541	$157.541	$45,214	29%
	Big Lake Structure	1	LS	$155,241	$155,241	$44,554	29%
	TOTAL Fish Egress Structures				**$312,782**	**$89,768**	
06.20	**Vegetation Plantings**						
	Mast Tree Plantings	352	AC	$1,948.42	$685,842	$196,837	29%
	Herbaceous Plantings	57	AC	$1,235.61	$70,430	$20,213	29%
	TOTAL Vegetation Plantings				**$756,272**	**$217,050**	
	TOTAL 06 Fish and Wildlife Facilities				**$1,081,332**	**$310,342**	
09	**Fish and Wildlife Facilities**						
	Mob & Demob	1	LS	$39,400	$39,400	$11,308	29%
	TOTAL Mob & Demob				**$39,400**	**$11,308**	
09.10	**Discharge Channel**						
	Surveying	18	Days	$2,306.72	$41,521	$11,917	
	Clearing, Grubbing, Stripping	25	AC	$8,105.44	$202,636	$58,157	29%
	Channel Excavation	59,167	CY	$2.42	$142,872	$41,004	29%
	Construct Channel Berms	68,782	CY	$5.24	$360,074	$103,341	
	Dewatering at Slim Lake	1	LS	$1,533	$1,533	440	29%
	Seeding	25	AC	$3,347.12	$83,678	$24,016	29%
	Riprap Erosion Protection	1	LS	$338.288	$338,288	$97,089	29%
	Articulated Concrete Block Mat	3000	SF	$15.36	$46,801	$13,432	29%
	TOTAL Discharge Channel				**$1,217,403**	**$349,396**	
	TOTAL 09 Fish and Wildlife Facilities				**$1,256,803**	**$360,704**	
13	**Fish and Wildlife Facilities**						
	Mob & Demob	1	LS	$51,698	$51,698	$14,837	29%
	TOTAL Mob & Demob				**$51.698**	**$14,837**	

Upper Mississippi River System
EMP-DPR With Integrated EA
Rice Lake State Fish and Wildlife Area HREP
LaGrange Pool, IWW, RM 132.0 - 138.0
Fulton County, Illinois

Acct Code	Item	Quantity	Unit	Unit Price	Cost	Contingency	Cont. %
13.10	**Pump Station**						
	Clearing, Grubbing, Stripping	1	AC	$11,758.00	$11,758	$3,375	29%
	Access Road	1	LS	$23,518	$23,518	$6,750	29%
	Coffer Dam	1	LS	$186,412	$186,412	$53,500	29%
	Pump Station Structure	1	LS	$594,652	$594,652	$170,665	29%
	Pumps	3	EA	$261,556	$784,667	$225,199	29%
	Control Building	1	LS	$297,012	$297,012	$85,242	29%
	Discharge Pipe and Structures	1	LS	$748,931	$748,751	$214,892	29%
	Reconstruct Road	1	LS	$5,505	$5,505	$1,580	29%
	Seeding	1	LS	$1,221	$1,221	$350	29%
	TOTAL Pump Station				**$2,653,496**	**$761,553**	
13.20	**Existing Voorhees Pump Station**						
	New 36" Gates	2	EA	$7,181	$14,362	$4,122	29%
	Pump Removal	1	LS	$4,081	$2,669	$766	29%
	Riprap Protection	1	LS	$18,792	$3,113	$893	29%
	Reconstruct Road	57	SY	$50.25	$2,864	$822	29%
	Install New 36" Pipe	100	LF	$153.59	$15,359	$4,408	29%
	TOTAL Voorhees Pump Station				**$38,367**	**$11,011**	
13.30	**Existing Rice Lake Pump Station Removal**						
	Building Removal	1	LS	$2,440	$2,440	$700	29%
	Electrical Removal	1	LS	$8,861	$8,861	$2,543	29%
	Pump Removal	1	LS	$5,077	$5,077	$1,457	29%
	Cap 36" Pipes	1	LS	$3,083	$3,083	$885	29%
	Fill and Cap Pump Station	1	LS	$12,538	$12,538	$3,598	29%
	TOTAL Existing Pump Station Removal				**$31,999**	**$9,183**	
	TOTAL 13 Fish and Wildlife Facilities				**$2,775,560**	**$796,584**	
15	**Fish and Wildlife Facilities**						
	Mob & Demob	1	LS	$20,755	$20,755	$5,957	29%
	TOTAL Mob & Demob				**$20.755**	**$5,957**	
15.10	**Perimeter Water Control Spillway**						
	Access Road Improvement	1	LS	$122,682	$122,682	$35,210	29%
	Spillway, Construct in Dry	6000	CY	$33.34	$200,047	$57,414	29%
	Spillway, Construct in Wet	16,000	CY	$25.19	$403,022	$115,667	29%
	Riprap	1	LS	$992,700	$992,700	$284,905	29%
	TOTAL Perimeter Spillway				**$1,718,451**	**$493,196**	

Upper Mississippi River System
EMP-DPR With Integrated EA
Rice Lake State Fish and Wildlife Area HREP
LaGrange Pool, IWW, RM 132.0 - 138.0
Fulton County, Illinois

Acct Code	Item	Quantity	Unit	Unit Price	Cost	Contingency	Cont. %
15.20	**Gravity Outlet (Gatewell) Structure**						
	Excavation	436	CY	$13.14	$5,731	$1,645	29%
	Slide gate Structure	1	LS	$71,947	$71,947	$20,649	29%
	60" Reinforced Concrete Piping	1	LS	$46,111	$46,111	$13,234	29%
	Backfill & Compaction	1	LS	$5,786	$5,786	$1,661	29%
	TOTAL Gatewell Structure				**$129,575**	**$37,189**	
15.30	**Water Control Structures**						
	2 - 24" Control Voorhees	2	EA	$22,917.50	$45,835	$13,155	29%
	2 - 24" Agri-drain Slim Lake	2	EA	$16,095.00	$32,190	$9,239	29%
	3 - 48" Control Rice Lake	3	EA	$52,106.00	$104,212	$29,909	29%
	3 - 48" Control Big Lake	3	EA	$47,996.50	$95,993	$27,550	29%
	TOTAL Control Structures				**$278,230**	**$79,853**	
	TOTAL 15 Fish and Wildlife Facilities				**$2,147,011**	**$616,195**	
	SUBTOTAL Fish and Wildlife Facilities Cost (06,09,13, and 15)				**$7,260,706**		
	SUBTOTAL Fish and Wildlife Facilities Contingencies					**$2,083,825**	
	TOTAL Fish and Wildlife Facilities Cost (06, 09, 13, and 15)				**$9,344,531**		
30	**Planning, Engineering and Design**						
	Plans and Specifications				$700,000	$77,000	11%
	Engineering During Construction				$200,000	$22,000	11%
	SUBTOTAL				**$900,000**	**$99,000**	
	TOTAL Planning, Engineering, and Design				**$999,000**		
31	**Construction Management**						
	Contract Administration				$600,000	$60,000	10%
	Shop Drawing Review						
	Inspection and Quality Assurance						
	SUBTOTAL				**$600,000**	**$60,000**	
	TOTAL Construction Management				**$660,000**		
				TOTAL PROJECT COST	**$18,468,531**		

A. Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R) Considerations. The proposed Project features have been designed to ensure low annual operation and maintenance requirements (table 11). The OMRR&R costs may include performing inspections, debris removal, sediment removal, additional riprap, and operating and performing routine maintenance on the pumps and pump station. The estimated total annual OMRR&R cost is $39,400. These quantities and costs may change during final design. A complete list of OMRR&R needs will be provided in an OMRR&R manual following construction.

Table 11. Estimated Annual OMRR&R Costs (October 2010 Price Level**)**

	Quantity	Unit	Unit Price ($)	Total Cost ($)
Operation				
Pump Operation [1]	336	hours	$40	$13,440
Site Inspection [2]	40	hours	50	2,000
Maintenance				
Mowing	32	acres	12	384
Mowing, Mast Tree Plantings	352	acres	17	5,984
Mowing/burning Wet Meadow [3]	57	acres	18	1,026
Road Gravel	200	cy	25	5,000
Debris Removal (channel/forebay /water controls)	100	hours	50	5,000
Subtotal				32,834
Rehabilitation [4]				
Contingencies (20%)				6,566
Total				39,400

[1] Pump operation costs include utility and upkeep costs for all pumps.
[2] Yearly cost to inspect all items.
[3] Represents an average cost over the first 5 years. Includes mowing 4 times the first year, 2 times the second year, and burning 1 time per year for years 3 through 5. After year 5, field will be burned off every 3 years at $12 per acre.
[4] Rehabilitation cannot be accurately measured. Rehabilitation is the reconstructive work that significantly exceeds the

B. Repair, Rehabilitation, and Replacement Considerations. For analysis purposes, the costs presented for OMRR&R used the 50-year period of analysis. However, the ILDNR is expected to operate and maintain the Project until it is no longer authorized. As such, the ILDNR should expect to incur costs associated with this responsibility outside of the 50-year period of analysis. Table 12 lists the major Project components and their associated frequencies of repair, rehabilitation, and replacement. Estimates of these costs will be included in the operation and maintenance manual.

Table 12. Repair, Rehabilitation, and Replacement Considerations

Component	Frequency
Rehab Electrical	Every 60 years
Repair Electrical	Every 20 years following an electrical rehab
Replace Gates, Trash Racks, Stoplogs	Every 80 years
Replace Pumps	Every 60 years
Repair Pumps	Every 20 years following a pump replacement
Repair Concrete Structures	As needed
Replace Concrete Structures	Every 75 years
Rehab Discharge Channel	Every 60 years

C. Monitoring Considerations. Costs for monitoring and collecting data are summarized in table 13. These costs include preparation of an annual evaluation report that summarizes the Project's progress towards meeting the stated goals and objectives.

Table 13. Estimated Post-Construction Annual Monitoring Costs ($) (October 2010 Price Level)

Item	Annual Cost ($)
Engineering Data [1]	$6,000
Natural Resource Data [1]	4,000
Subtotal	**10,000**
Contingencies (20 percent)	2,000
Subtotal	**12,000**
Planning, Engineering, Design [2]	3,000
Total	**$15,000**

[1] Reference tables 16 and 17
[2] Includes cost of annual evaluation report

9. ENVIRONMENTAL EFFECTS

A. Summary of Effects. The Rice Lake SFWA is a large and complex site with a variety of resources that vary greatly in quantity and quality. The goals for the Project are to restore wetland, aquatic, and floodplain habitat. For proposed wetland and aquatic habitat rehabilitation/enhancement (perimeter spillway, pump station, and fish access structures), no alteration of vegetative cover type is anticipated, with the exception of the immediate construction footprint. The proposed measures are expected to have a net positive effect on the quality of existing habitat in the Project area. For proposed floodplain habitat restoration, one cover type (agricultural field on Duck Island) would be converted to two other cover types (native wet meadow and mast-dominant floodplain forest). The expected increases in habitat quality and quantity would help to fulfill management objectives to meet the State's goals for the site, as outlined in section 3, paragraph D.

Operation of the Project to meet the management objectives of the Rice Lake SFWA is expected to have a positive effect on natural floodplain values. Because the perimeter spillway would provide only a low level of protection from seasonal river stage fluctuations, no measurable change in floodplain storage is anticipated and no change in flood heights is expected to result from this action. The Project is expected to have a net positive effect on wetland wildlife habitat. Despite the footprint impacts associated with construction of the discharge channel and perimeter spillway, the overall wetland function within the complex will remain.

B. Economic and Social Impacts

1. Community and Regional Growth. No short-term or long-term impacts to the growth of the neighboring community or region would be realized as a result of the Project. The Project would improve recreation opportunities at the Rice Lake SFWA, increasing the attractiveness of the area for wildlife observation, waterfowl hunting, sport fishing, camping, canoeing, photography, and commercial fishing.

2. Community Cohesion. The proposed Project has positive impacts on community cohesion as the wildlife area attracts many visitors and recreationists from other communities. Overall, the Project would have no adverse impacts to the quality of the human environment.

3. Displacement of People. There are no residential properties in the Project area that would be displaced by the proposed Project.

4. Property Values and Tax Revenues. Approximately 507 acres on Duck Island are currently leased for crop production. The Project proposes to convert 409 acres of agricultural field to a combination of forest and wet meadow cover types, thus removing the acreage from production.

5. Public Facilities and Services. The Rice Lake SFWA attracts over 150,000 visitors each year. The proposed habitat restoration Project would positively impact public facilities and services by enhancing outdoor recreational opportunities.

6. Life, Health, and Safety. The Project poses no threats to the life, health, or safety of recreationists in the area. An HTRW assessment was conducted and no obvious indications of potential contamination sources or migration pathways from surrounding properties were noted.

7. Business and Industrial Activity. No significant changes in business and industrial activities would occur during Project construction. Long-term impacts to business and industrial development would be related to tourism and recreational activities. Duck Island is the site of a small sand and gravel operation that is permitted through 2011 with an option for renewal.

8. Employment and Labor Force. Short-term employment opportunities in the area may increase slightly during Project construction. The Project would not directly affect employment of the labor force in Fulton County, Illinois.

9. Farm Displacement. No farms would be displaced as a result of the proposed Project. Conversion of Duck Island agricultural fields would remove 409 acres from crop production. This is leased land, and is not a main source of income for the tenant.

10. Aesthetic Values. The enhancement of the SFWA would ensure continued waterfowl use of the complex and surrounding areas, and make the complex more aesthetically pleasing to visitors.

11. Noise Levels. Heavy machinery would generate a temporary increase in noise levels during Project construction, disturbing wildlife and recreationists in the area. The Project area is basically rural in nature, and no significant, long-term impacts would result.

C. Natural Resources Impacts. Effects of the Project on the quality and quantity of fish and wildlife habitat were evaluated using WHAG (Urich, *et al.*, 1984) methodologies, as described in section 5 and Appendix D, *Habitat Evaluation and Quantification*. These habitat evaluation methods were used during Project planning to evaluate features in terms of increased benefits to wildlife resources. Optimization of AAHUs in relation to Project costs for evaluated species is considered the goal of feature selection. Results of the habitat evaluations are summarized in table 3, with a more detailed analysis in Appendix D, *Habitat Evaluation and Quantification*. Assessment of Project impacts also was based on experience from past and current management practices.

Construction of the perimeter spillway will require clearing approximately 4.8 acres of bottomland hardwood vegetation, primarily second growth silver maple with occasional large cottonwoods. The spillway will be constructed using adjacent material or material mechanically dredged from Goose Lake. The spillway will be reseeded with flood-tolerant grass species to control erosion and protect the integrity of the structure. Construction of pumping and drainage facilities will occur primarily in areas that have been previously disturbed; however, approximately 20 acres of forested and nonforested wetland will be impacted by construction activity. Clearing in all areas will be limited to the minimum necessary for construction. Operation of the Project will not create conditions new to the plant species bordering the water level management structures.

1. Aquatic Resources. Additional discussion of aquatic and water quality impacts is contained in Appendix B, *Clean Water Act, Section 404(b)(1) Evaluation*. A slight increase in turbidity in Goose Lake may occur from mechanical dredging and stockpiling of borrow material. The increased turbidity is expected to have negligible impact considering existing turbidity levels in the IWW and the backwaters of the Rice Lake SFWA. As indicated in the WHAG analysis, the fish passage structure should benefit fisheries by providing access to deepwater habitat during drawdown periods. Implementation of the proposed Project is not expected to either facilitate or restrict the potential occurrence of aquatic invasive species (e.g. Asian carp) in the Project area and vicinity. At the same time, the ongoing presence of aquatic invasives in the Illinois River ecosystem is not expected to affect the success of the proposed action in meeting Project objectives.

2. Wetland and Floodplain Resources. The proposed plan would benefit more than 3,054 acres of nonforested wetland/shallow aquatic habitat through water level control capability. The primary benefits would be increased reliability of moist-soil food production and access to feeding areas during fall and spring migration. Migratory waterfowl, shorebirds, and wading birds would benefit from more reliable feeding and resting areas. Muskrat populations should not be negatively affected, and would be expected to benefit from an increase in emergent and moist-soil vegetation, as indicated by the WHAG analysis. Wetland and floodplain resources would benefit from the increased habitat diversity provided by the proposed native mast tree and herbaceous plantings on approximately 409 acres of existing agricultural field on the Duck Island peninsula. While some loss of habitat to mallard and goose is expected to result from the agricultural field conversion, no overall loss of habitat value to these or any of the other evaluated species is expected if the Recommended Plan is implemented.

3. Endangered Species. As noted in section 2, paragraph G, suitable habitat for the sheepnose mussel and the eastern prairie fringed orchid is not present within the construction footprint, and Project implementation is not expected to impact existing habitat for either species. For these reasons, the proposed Project will not affect the sheepnose mussel or prairie fringed orchid.

Construction of the perimeter spillway is not expected to directly impact any trees regularly used by bald eagles during nesting or foraging activities. If necessary, construction activities will be scheduled for periods when few, if any, eagles are present (usually April 1 to October 30). The USFWS, in their 1997 Coordination Act Report (Appendix A), stated that the proposed Project would not affect bald eagles or their habitats. The ILDNR has identified at least one bald eagle nest within approximately 250 yards from the construction footprint, which has not been active for the past 2 years. The Corps will continue to coordinate with ILDNR Natural heritage staff to monitor this nest to determine if any changes occur that could require modification of construction activities or schedules. For these

reasons, the proposed Project is not expected to impact bald eagles or their habitat.

Incidental impacts to individual specimens of decurrent false aster may occur during construction of the perimeter spillway or conveyance channels. These effects would be minor and short-term. Clearing for construction of the perimeter spillway could have a slight positive effect on decurrent false aster in the long term by expanding openings in the existing tree canopy and exposing previously shaded areas to full sun. Decurrent false aster populations in the Rice Lake SFWA are not expected to be adversely affected by operation of the proposed Project. Impacts to the documented population located along the northern portion of the water control spillway will be avoided by installing a temporary protective fence, if necessary, during construction work in the area. Additional measures to offset any construction-related impacts to individuals of the species would include the continued management of a nearby wet swale (Pond Lily Lake) to promote and sustain growth of decurrent false aster by periodic disturbance and control of woody vegetation if needed.

The federally-endangered Indiana bat (*Myotis sodalis*) may roost and forage for insects along the IWW floodplain during spring and summer months. The USFWS lists the bat as potentially occurring statewide in Illinois, and suitable habitat for the species exists in the floodplain forests of the Project area. Where suitable habitat, described in section 2, paragraph G, occurs in the construction zone, to avoid the potential for direct impact to Indiana bats, no trees over 9 inches dbh will be cut between April 1 and September 30.

No adverse impacts to state-listed threatened or endangered species are expected to result from Project construction or subsequent operation and management. Least bittern and king rail were among the species evaluated as part of the WHAG analysis, and these are expected to benefit from Project implementation. Ospreys are nesting at adjacent Banner Marsh SFWA and in 2007 there was a report of an unsuccessful osprey nesting attempt at Rice Lake SFWA within the northern HREP Project area. There are no current osprey nests known in the Project areas. However, if an osprey nest is built within 0.25 mile of any of the construction areas, ILDNR Natural Heritage staff will be contacted for distance and timing recommendations.

D. Historic Properties. Illinois State Museum (1996:25) documents 27 archeological sites within the 177.87 hectares (439.5 acres) investigated, including seven prehistoric isolated finds, 14 prehistoric sites, one historic site, and five mixed component historic and prehistoric sites. The Illinois State Museum recommended four of these sites as potentially eligible for listing to the NRHP: 11F2745, 11F2746, 11F2895, and 11F2886. Based on these NRHP-eligibility recommendations, the Corps has designed this Project with a 30-meter (m) easement along the perimeter of these four sites, so that no trees are planted within this buffer. This avoids disturbance by both the tree planting process and by any future disturbance by mature tree roots.

In addition, the Corps has determined that the Copperas Creek Lock (11F2723) is individually eligible for listing to the NRHP under Criteria A and C. This lock was constructed by the Corps and the State of Illinois between 1873 and 1877 as part of the IWW navigation improvement and is presently owned by the city of Canton, Illinois. The history and significance of this lock and the NRHP eligible Multiple Property Chicago to Grafton, Illinois, Navigable Water Link, 1836-1945, is extensively documented by American Resources Group Ltd. (1996).

The proposed pump station location is adjacent to the Copperas Creek Lock and is buffered by mature trees and undergrowth. Therefore, those significant characteristics of the Copperas Creek Lock under Criteria A and C [as documented by American Resources Group Ltd. (1996)] will remain. The primary visual boundaries of the lock are between the ground surface and waterline, while the proposed Pump Station will be visually hidden from Copperas Creek Lock by vegetation, and have a low profile well below extant tree height. By applying the Criteria of Effect under 36 CFR Part 800.9(a): "Protection of Historic Properties," the Corps determined that No Effect to the NRHP eligible Copperas Creek Lock would occur from the construction of the Rice Lake HREP and associated pump station feature.

Because of the potential for effects to the archaeological component of site 11F2723, the Corps provided Phase II testing at this location. In the report of this work, Illinois State Museum (2002:4) stated that 11F2723 did not meet the requirements for listing on the NRHP and recommended Project clearance.

The IHPA, Springfield, Illinois, concurred with the recommendations of the draft archeology reports prepared by Illinois State Museum, and with the Corps findings, recommendations, and determination of effect by letter dated December 6, 1996 (Appendix A, IHPA LOG# 961205001P-F), and letter, dated June 18, 2003 (IHPA LOG#010051503). A final copy of the archeology report: *Phase I Intensive Archaeological Survey for Historic Properties Within the Upper Mississippi River System-Environmental Management Program (UMRS-EMP) for the Rice Lake State Conservation Area, Fulton County, West-Central, Illinois,* dated January 1997, and a final copy of the ASSR: *Subsurface Testing of Portions of 11F2723 for the Rice Lake Habitat Rehabilitation and Enhancement Project,* dated March 4, 2002, were provided to the IHPA and the ILDNR, as evidence of the Corps' compliance pursuant to Section 106 of the NHPA, and determination of No Effect pursuant to 36 CFR Part 800.5(b). All consulting parties must be aware that the specific locations of historic and archaeological properties are subject to protection through nondisclosure under Section 304 of the NHPA. This information is not to be released in order to protect the resources at the sites and any request for site reports and site location information shall include comment from the IHPA, Springfield, Illinois.

In a letter to the IHPA dated November 29, 1996 (Appendix A, *Correspondence*; an identical Corps letter was provided to the ILDNR), the Corps proposed avoidance of sites 11F2745, 11F2746, 11F2895, and 11F2886 by use of a 30-meter buffer around each site and determined that this Project would have "no effect" on the Copperas Creek Lock. In a reply dated December 6, 1996 (Appendix A), the IHPA concurred with the Corps, stating "the Project, as proposed, will have no effect on sites or structures eligible or potentially eligible for listing on the National Register of Historic Places."

If human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered or collected, the Corps will comply with all provisions outlined in the appropriate state acts, statutes, guidance, provisions, etc., and any decisions regarding the treatment of human remains will be made recognizing the rights of lineal descendants, Tribes, and other Native American Indians and under consultation with the SHPO/THPO(s) and the other consulting parties, designated Tribal Coordinator, and/or other appropriate legal authority for future and expedient disposition or curation. When finds of human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered or

collected from Federal lands or federally recognized tribal lands, the Corps will coordinate with the appropriate federally recognized Native American Tribes, pursuant to the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001 *et seq*.) and its implementing regulations (43 CFR Part 10).

The Corps has met its legal and regulatory requirements for compliance with historic properties laws and regulations. If any historic properties are encountered, uncovered, or discovered, indirectly or directly associated with the Rice Lake HREP construction, all disturbance activities will halt which could potentially affect the historic properties. The Corps will notify the IHPA to coordinate measures to determine the significance of, and to avoid and minimize any potential effects to, historic properties.

E. Mineral Resources. No significant impacts to mineral resources are expected to occur as a result of this Project. The remaining supply of aggregate material is variously estimated from approximately 6,400 tons per acre to 9,000 tons per acre with approximately 375 acres estimated suitable for potential mining. The mining activity on Duck Island has been seasonal and is subject to closure during high water. The minerals extracted are of average quality and when processed correctly meet the Illinois Department of Transportation standards. The mine operator's lease was extended through 2011 with an option for renewal. The native mast tree and herbaceous planting feature could potentially affect future mining activity at the Duck Island quarry if the ILDNR does not continue the commercial lease beyond 2011.

F. Farmland Protection. There are approximately 507 acres of existing cropland on the Duck Island peninsula. The proposed planting features would convert 409 acres of this cropland through planting of native mast-producing trees and herbaceous species. Examination of the Fulton County Soil Survey indicates that most of the agricultural field soils are classified as prime farmland soils. An updated U.S. Department of Agriculture Form AD-1006 will be submitted to the Natural Resources Conservation Service for review. Full compliance under Farmland Protection Policy Act will be completed prior to implementation of the planting features.

G. Cumulative Impacts. Although minor short-term impacts are likely to occur to local animals and plants within the construction footprint, no significant cumulative adverse impacts are expected. The habitat restoration measures proposed as part of this HREP should have long-term benefits to the fish and wildlife populations utilizing the site. This Project, cumulatively with other HREPs and other ecosystem restoration efforts on the IWW, should help to counter other past and ongoing adverse impacts to the river ecosystem such as sedimentation, pollution, and general decline in riverine and floodplain habitat.

H. Adverse Impacts Which Cannot Be Avoided. The most notable unavoidable adverse impact would be the clearing of vegetation for construction of Project features. The perimeter spillway was designed to follow the alignment of the existing access road and the natural levee along the IWW. Construction of the spillway will involve placement of fill material in areas that currently are lower than the design crest elevation of 440.0. Approximately 4.8 acres of woody vegetation are expected to be cleared as a result of construction. Most of this clearing would occur along the downstream portion of the perimeter spillway alignment, where more extensive filling would be required to meet the 440.0 crest elevation. Another 20 acres of forested and nonforested wetland are expected to be cleared for

construction of pumping and drainage facilities. Clearing of existing vegetation, particularly mature woody vegetation, would be kept to the minimum required for construction activities and post-construction maintenance, and will adhere to seasonal restrictions recommended by the USFWS and the ILDNR for protection of threatened and endangered species.

I. Short-Term Versus Long-Term Productivity. Construction activities would temporarily disrupt wildlife and human use of the Project area. Long-term productivity for natural resource management would benefit considerably by the construction of this Project. Long-term productivity would be enhanced through increased reliability of seasonal water levels, promoting the success of emergent and moist-soil vegetation and providing more dependable feeding and resting areas for migratory and resident wildlife. Overall habitat diversity would be increased, and both game and nongame wildlife species would benefit from the proposed Project. In turn, both consumptive and nonconsumptive users would realize heightened opportunities for recreational use of the Rice Lake SFWA.

J. Irreversible or Irretrievable Resource Commitments. The purchase of materials and the commitment of man-hours, fuel, and machinery to perform the Project are irretrievable. Other than the aforementioned, none of the proposed actions are considered irreversible.

K. Relationship of the Proposed Project to Land-Use Plans. The proposed Project is in compliance with the Rice Lake SFWA Natural Resource Management Plan (ILDNR, 1989). The proposed Project is not in conflict with any land-use plans currently being used for the site.

L. Compliance with Environmental Statutes. Compliance with applicable statutes is summarized in table 14.

Table 14. Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements

Federal Environmental Protection Statutes and Requirements	Applicability/ Compliance
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum, 11 Aug 80)	Full compliance
Archaeological and Historic Preservation Act, 16 U.S.C. 469, et seq.	Full compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full compliance
Clean Water Act, Sections 404 and 401	Full compliance
Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq.	Full compliance
Farmland Protection Policy Act. 7 U.S.C. 4201, et seq.	Full compliance
Federal Water Protection Recreation Act, 16 U.S.C. 460-(12), et seq.	Full compliance
Flood Plain Management (Executive Order 11988)	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Full compliance
Protection of Wetlands (Executive Order 11990)	Full compliance
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Not applicable
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Not applicable

Full compliant: no requirements for the statute required.

10. PROJECT PERFORMANCE ASSESSMENT MONITORING

This section summarizes the monitoring and data collection aspects of the Project. The primary Project objectives have been summarized elsewhere in this document, and the performance assessment is designed to gauge progress toward meeting these objectives.

Section 2039 of WRDA 2007 states that when conducting a feasibility study for a project or component of a project for ecosystem restoration, the recommended Project includes a plan for monitoring the success of the ecosystem restoration. The implementation guidance for Section 2039, in the form of a CECW-PB Memo dated 31 August 2009, also requires that an adaptive management plan be developed for all ecosystem restoration projects. At the programmatic level, knowledge gained from monitoring one project can be applied to other projects. Opportunities for this type of adaptive management are common within the UMRS-EMP, which also builds upon lessons learned in other related efforts, such as the Illinois Ecosystem Restoration program.

The primary incentive for implementing an adaptive management program is to increase the likelihood of achieving desired project outcomes given the identified uncertainties, which can include incomplete description and understanding of relevant ecosystem structure and function; imprecise relationships among project management actions and corresponding outcomes; engineering challenges in implementing project alternatives; and ambiguous management and decision-making processes.

The restoration features in the Recommended Plan have been operating successfully for nearly 20 years at several locations within the UMRS. Further, 15 miles upstream of the Project area, a similar project of smaller scale has been approved for construction. Using an adaptive management approach during project planning enabled better selection of appropriate design and operating scenarios to meet the project objectives. Lessons learned in designing, constructing and operating similar restoration projects within the UMRS have been incorporated into the planning and design of this HREP to ensure that the Recommended Plan represents the most effective design and operation to achieve project goals and objectives. As with other HREPs implemented through the UMRS-EMP, a monitoring and performance assessment plan has been developed, and the results of the plan will be used to measure success of the Project and determine whether adjustments in operation may be made to promote its success.

Table 15 presents overall types, purposes, and responsibilities of monitoring and data collection. Table 16 presents actual monitoring and data parameters grouped by Project phase, as well as data collection intervals. Table 17 presents the post-construction evaluation plan, which displays the specific parameters and the levels of enhancement that the Project hopes to achieve.

Baseline biological monitoring data for Rice Lake was collected by the USFWS, the ILDNR, and Non-Governmental Organizations and is compiled and analyzed in Appendix C. This data is meant to be used as a representative pre-construction baseline for waterfowl, submerged aquatic vegetation and fisheries in the Project area. Monitoring data collected before and after completion of this Project will be used to determine the success of Project features. Collection and analysis of data on native species observed and recorded during annual migratory waterfowl surveys, aquatic vegetation sampling, and fisheries monitoring will provide information to support determination of success or failure of Project features, and will be used to assess whether and what adaptive management measures may be implemented to ensure Project success.

Table 15. Monitoring and Performance Evaluation Matrix

Project Phase	Type of Activity	Purpose	Responsible Agency	Implementing Agency	Funding Source	Implementation Instructions
Pre-Project	Pre-Project Monitoring Baseline Monitoring	Identify and define problems at HREP site. Establish need of proposed Project features. Establish baselines for performance evaluation.	NFS Corps	NFS Field Station or NFS through Cooperative Agreements or Corps	NFS HREP/-NFS	See table 16
Design	Data Collection for Design	Include quantification of Project objectives, design of Project, and development of performance evaluation plan.	Corps	Corps	HREP	See table 16
Construction	Construction Monitoring	Assess construction impacts; assures permit conditions are met.	Corps	Corps	HREP	See State Section 401 Stipulations
Post-Construction	Performance Evaluation Monitoring Biological Response Monitoring	Determine success of Project as related to objectives. Evaluate predictions and assumptions of HU analysis. Study beyond scope of performance evaluation.	Corps (quantitative) NFS (field observations) Corps	Field Station or NFS through Cooperative Agreement, NFS thru OMRR&R, or Corps Corps	HREP/-NFS HREP	See table 17

Table 16. Resource Monitoring and Data Collection Summary [1]

	WATER QUALITY DATA						ENGINEERING DATA			NATURAL RESOURCE DATA				
	Pre-Project Phase		Design Phase		Post-Construction Phase		Pre-Project Phase	Design Phase	Post-Const. Phase	Pre-Project Phase	Design Phase	Post-Const. Phase		
Type Measurement	**Apr-Sep**	**Oct-Mar**	**Apr-Sep**	**Oct-Mar**	**Apr-Sep**	**Oct-Mar**							**Sampling Agency**	**Remarks**
Point Measurements														
Water Quality Stations [2]													Corps	
Turbidity														
Secchi Disk Transparency														
Suspended Solids														
Dissolved Oxygen														
Specific Conductance														
Water Temperature														
PH														
Total Alkalinity														
Chlorophyll														
Velocity														
Water Depth														
Water Elevation														
Percent Ice Cover														
Ice Depth														
Percent Snow Cover														
Snow Depth														
Wind Direction														
Wind Velocity														
Wave Height														
Air Temperature														
Percent Cloud Cover														

Table 16. Resource Monitoring and Data Collection Summary [1]

	WATER QUALITY DATA						ENGINEERING DATA			NATURAL RESOURCE DATA				
	Pre-Project Phase		Design Phase		Post-Construction Phase		Pre-Project Phase	Design Phase	Post-Const. Phase	Pre-Project Phase	Design Phase	Post-Const. Phase		
Type Measurement	**Apr-Sep**	**Oct-Mar**	**Apr-Sep**	**Oct-Mar**	**Apr-Sep**	**Oct-Mar**							**Sampling Agency**	**Remarks**
Elutriate Test Stations														
Column Settling Stations														
Column Settling Analysis								1					Corps	
Boring Stations [3]														
Geotechnical Borings								1					Corps	
Fish Stations														
Electrofishing/Seining										1		1Y 1-2	ILDNR	
Transect Measurements														
Vegetation Transects														
Mast Tree Survey												5Y	Corps	
Area Measurements														
Mapping														
Vegetation Mapping										1		1Y 1-5	Corps	
Wet Meadow Plant Survey												5Y 6-50	Corps	
Aerial Photography/ Remote														

Legend

W = Weekly — nW = n-Week Interval
M = Monthly — nY = n-Year Interval
Y = Yearly — 1,2,3 = Number of times data is collected within designated Project phase

[1] See plate 35 for active monitoring sites.
[2] Water Quality Station (W-I135.4B)
[3] Corps of Engineers Geotechnical Borings - See plates 31 through 34 for locations and boring dates

Table 17. Post-Construction Evaluation Plan – Enhancement Potential

Goal	Objective	Enhancement Features	Unit	Year 0 w/out Alt.	Year 1 w/Alt	Year 25 [1] w/ Alt	Year 50 Target w/Alt.	Feature Measurement - See Table 15	Annual Field Observations by Site Manager
Restore Wetland Habitat	Increase the areal coverage as measured in acres of annual emergent and moist soil vegetation in Big Lake and Goose Lake during the summer growing season. Decrease summer water levels to below 440 in Big Lake, Goose Lake, and Rice Lake in order to promote vegetation growth during the summer growing season (Target is to achieve this condition 5 years of every 10)	Construct low perimeter spillway around Big Lake and Goose Lake Construct pump station with conveyance ditches	probability of successful operation (%)	10	40	40	40	Seasonal inundation and vegetation measurements by aerial survey/GIS and ground observations	record observations for both drawdown and flooding; inspect and record discharge channel and water control structures condition
Restore Aquatic Habitat	Increase connectivity between Big and Rice Lakes during summer draw downs in order to reduce fish mortality and avian botulism. Increase year-round flowing side channel habitat areas within the project area to provide habitat for fish and other aquatic species.	Provide access from Rice Lake to deepwater areas in quarry Provide access from Goose Lake to Illinois River Dredge Senate Island side channel	fish movement from Rice Lake to quarry and from Goose Lake to IWW	0	structures accessible to fish during lowering of interior water levels	structures accessible to fish during lowering of interior water levels	structures accessible to fish during lowering of interior water levels	outlet side fish egress structure net sampling	record observations on fish kills, avian botulism cases
Restore Floodplain Habitat	Increase areal coverage in acres of year-round floodplain forest and wetland vegetation on Duck Island agricultural fields to provide scarce habitat for wildlife.	Establish native mast tree and herbaceous plantings on Duck Island	survival (%) acre	0 0	100 57	50 57	25 57	tree count/random sampling vegetation survey by aerial photography/GIS analysis	estimate effective acreage and record observed wildlife use estimate area of established/ regenerated

[1] The year of monitoring varies with purpose and nature of goal and feature.

11. REAL ESTATE REQUIREMENTS

The Project will be cost-shared by the ILDNR, as the NFS. All of the lands currently required for the Project are owned in Fee Simple Title by the ILDNR. A portion of the Rice Lake SFWA was purchased using Federal funds through the Federal Aid in Wildlife Restoration Program. This portion of the Rice Lake SFWA does not fall within the proposed Project boundary. The lands proposed for the Rice Lake HREP currently do not entail previous Federal involvement. The real estate interests required for the Project consist of approximately 3,593 acres in Fee Simple Title, as well as 8.02 acres for Temporary Easement. Upon execution of a Project Partnership Agreement, lands acquired for Project purposes may be eligible for credit against the NFS's 35 percent requirement. Lands already owned as part of a previous Federal Project cannot be considered for credit. Detailed information relating to the real estate aspects of the Project can be found in Appendix L, *Real Estate Plan*.

12. IMPLEMENTATION RESPONSIBILITIES AND VIEWS

A. U.S. Army Corps of Engineers, Rock Island District. The Corps is responsible for Project management and coordination with the ILDNR, the USFWS, and other affected agencies. The Corps will submit the subject DPR and program funds; finalize plans and specifications; complete all NEPA requirements; advertise and award a construction contract; and perform construction contract supervision and administration. Section 906(e) of WRDA 1986 states that first cost funding for enhancement features will be cost shared with the State of Illinois because the Project features will be located on state owned land. Section 509 of WRDA 1999 indicates that the non-Federal share of the costs shall be 35 percent. The Corps has agreed to support this HREP's monitoring and data collection needs as outlined in tables 15 and 16.

B. U.S. Fish and Wildlife Service. The USFWS has provided final comments for this Project pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act of 1973, as amended (Appendix A). The USFWS has agreed to support this HREP's monitoring and data collection needs as outlined in tables 15 and 16.

C. Illinois Department of Natural Resources. As the NFS, the ILDNR will be required to provide all lands, easements, rights-of-way, relocations, and borrow and disposal sites. In addition, a cash contribution is needed if the creditable cost of the aforementioned real estate actions is less than 35 percent of total Project costs. The OMRR&R of the Project is the responsibility of the ILDNR in accordance with Section 107(b) of WRDA 1992, Public Law 102-580. These functions will be further specified in the Project O&M Manual to be provided by the Corps prior to final acceptance of the Project by the Sponsor. The ILDNR has agreed to support this HREP's monitoring and data collection needs as outlined in tables 15 and 16.

The DPR and plans and specifications costs shall be included as part of the total Project costs to be shared 65 percent Federal and 35 percent non-Federal. The NFS shall:

- Provide all lands, easements, rights-of-way, relocations, and excavated or dredged material disposal areas (LERRD), and provide or pay the Federal government the cost of

providing all retaining dikes, wasteweirs, bulkheads, and embankments at any dredged or excavated material disposal areas determined by the Federal government to be necessary for construction, operation, and maintenance of the Project.

- Provide, during construction, any additional costs as necessary to make the total non-Federal contributions equal to 35 percent of the total Project costs. No work-in-kind is anticipated. The non-Federal share is estimated at $7,267,000 (FFE). The value of the LERRDs needed for the Project will be deducted from this amount

- Not use Federal funds to meet the NFS's share of total Project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

- Prevent obstructions of, or encroachments on, the Project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the aquatic ecosystem restoration, hinder its OMRR&R, or interfere with the proper function such as any new development on Project lands or the addition of facilities that would degrade the benefits of the Project.

- Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way required for construction and OMRR&R of the Project, including those required for relocations, the borrowing of material, or disposal of dredged or excavated material, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

- Operate, maintain, repair, replace, and rehabilitate the completed Project or functional portion of the completed Project as described in Section 6. at no cost to the Federal government, in accordance with the applicable Federal and State laws and any specific directions prescribed by the Federal government for so long as the Project is authorized. The annual OMRR&R costs are estimated at $39,400.

- Grant the Federal government a right to enter, at reasonable times and in a reasonable manner, upon land which the NFS owns or controls for access to the Project for the purpose of inspection, and, if necessary, for the purposes of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project.

- Hold and save the Federal government harmless from damages due to the construction and OMRR&R of the Project, except where such damages are due to the fault or negligence of the Federal government or its contractors.

- Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the Project to the extent and in such detail as will properly reflect total Project costs for a minimum of three years after completion of the Project construction for which such books, records, documents, and other evidence are required.

- Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements, including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq*.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq*.) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c).

- Perform, or cause to be performed, any investigations for hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way necessary for construction, operation, and maintenance of the Project; except that the NFS shall not perform such investigations on lands, easements, or rights-of-way that the Federal government determines to be subject to the navigation servitude without prior specific written direction by the Federal government.

- Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA-regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal government determines are necessary for construction, operation, and maintenance of the Project.

- Agree that, as between the Federal government and the NFS, the NFS shall be the operator of the Project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the Project in a manner that will not cause liability to arise under CERCLA.

- Provide the non-Federal share of that portion of the costs of data recovery activities associated with historic preservation that are in excess of 1 percent of the total amount authorized to be appropriated for the Project.

The State of Illinois, through the ILDNR, provided a letter of support for the project on April 9, 2010 (Appendix A). The ILDNR letter states their support for the project features as recommended, shows their understanding of the project's costs and cost sharing requirements, and offers their assistance in obtaining all permits and certifications.

13. COORDINATION, PUBLIC VIEWS, AND COMMENTS

Throughout a feasibility study, the Corps strives to inform, educate, and involve the many groups who may have an interest in the project. This coordination is paramount to assuring that all interested parties have the opportunity to be part of the planning process. One process used for coordination is the public involvement process. Public involvement is the exchange of information with various segments of the public. It attempts to reduce unnecessary conflict and achieve consensus. The goal of

public involvement and coordination is to open and maintain channels of communication with the public in order to give full consideration to public views and information in the planning process (ER 1105-2-100, Appendix B - Public Involvement, Collaboration and Coordination).

An effective public involvement program must identify and respond to as many affected publics as possible and consider their input in the project's decision-making process. Content analysis is the method employed to identify public opinion, concerns, and potential controversy. It ensures that the public involvement plan is responsive to the level of interest and concern expressed by the public, and it assesses the effectiveness of the public involvement techniques.

The main forum for receiving feedback during the Rice Lake SFWA HREP was through the project's open house. The open house attendees were offered comment sheets to express their concerns and provide comments. During the planning process, the Corps coordinated not only with its cost-sharing partner, the ILDNR, but also with numerous groups including elected congressional representatives; Federal, State, county, and city agencies; environmental groups/organizations; businesses; media; and the unaffiliated general public.

In January 2010, a press release was issued providing the project's background and purpose, a project update; and announced a January 27, 2010, open house. The release also listed points of contact for comments/questions. The January 27, 2010 open house was held in Banner, Illinois. The purpose of the open house was to provide information on the project status and on the alternatives being considered for restoring the environment within the Illinois River watershed at the Rice Lake SFWA and to gather comments on the alternatives. Corps and ILDNR representatives were present to discuss the project with the public on a one-to-one basis and to receive the public's comments.

A total of 73 people attended the open house. Of those, 29 percent (21) returned comment sheets. Overall, comments were very favorable regarding the open house format, displays, and the goals of the project. A strong majority of attendees agreed that the open house provided an opportunity to gain information and a better understanding of the project, that the materials and displays were informative, and that they had a chance to talk to a planning team member and offer comments about the project.

The majority of questions asked during the question and answer sessions were directed at how the project would affect fishing, hunting, bald eagles and management of the Rice Lake SFWA. The Sierra Club, Eagle Nature Foundation, and three private citizens provided formal written comments questioning the project's need, threatened and endangered species coordination, and the ILDNR's site management and capability of performing OMRR&R. The ILDNR answered these concerns in a letter to Illinois State Senator David Koehler dated August 4, 2010 (Appendix A, page A-126).

In summary, various publics were identified as target audiences for public involvement and coordination, including elected congressional representatives; Federal, State, county, and city agencies; environmental groups/organizations; farm bureaus; businesses; media; and the unaffiliated general public.

The goals of the coordination process are to inform, educate, and involve the public and solicit feedback through open communication and to include in the plan formulation process all publics

interested in and affected by the project recommendation(s). The public open house provided the public with an opportunity to become informed and educated about the project and involved in the project by providing feedback to the planning team. The feedback was gathered, analyzed and used by the planning team to shape the plan formulation process and to develop the recommended plan. The plans that are included in this report have been influenced by the public involvement process.

A. Coordination Meetings. Ongoing coordination among the Corps, the USFWS, the ILDNR, and the general public was demonstrated by the following meetings:

- November 30, 1987. Plan formulation meeting with the District, the ILDNR, and the USFWS
- June 19, 1995. District in-house meeting; general Project discussion
- June 22, 1995. General Project discussion with the District and the ILDNR
- January 23, 1996. General coordination meeting with the District and the ILDNR
- February 5, 1996. General Project discussion with the District and the ILDNR
- January 23, 2003. General Project discussion with the District and the ILDNR
- March 27, 2003. General Project discussion with the District and the ILDNR
- June 2, 2004. General Project discussion with the District and the ILDNR
- September 2, 2006. General Project discussion with the District and the ILDNR
- October 7, 2007. Meeting with members of the general public to discuss Project features and receive comments.
- October 1, 2009. General Project discussion with the District and the ILDNR
- January 27, 2010. Open House held at the Banner Township Hall, Banner, Illinois, to discuss Project features and receive comments from the general public and other interested parties
- March 2, 2010. General Project discussion with the District, the ILDNR, and the general public regarding comments on the public review draft report
- March 8, 2010. Real estate needs discussion with the District and the ILDNR.

B. Coordination by Correspondence. The following letters are contained in Appendix A, *Correspondence*:

- Letter dated January 30, 1987, from the Illinois Department of Conservation to the District DE
- District letter, dated June 29, 1995, to the IHPA
- District letter, dated June 29, 1995, to the Illinois Department of Conservation
- Letter dated July 20, 1995, from the IHPA deferring comment to the ILDNR
- District Memorandum for Record, dated June 6, 1996
- District Memorandum for Record, dated June 8, 1996

- Letter dated September 9, 1996, from the District to Project proponents and other reviewing agencies requesting preliminary comments concerning the proposed Project
- Letter dated September 10, 1996, from the District to the ILDNR providing Scope of Work for Phase I Intensive Archeological Survey for Historic Properties
- Letter dated September 10, 1996, from the District to the IHPA providing a Scope of Work for Phase I Intensive Archeological Survey for Historic Properties
- Letter dated October 11, 1996, from the District to the Natural Resources Conservation Service requesting determination of whether the proposed Project site contains farmland subject to the provisions of the Farmland Protection Policy Act of 1981
- Farmland Conversion Impact Rating, dated November 5, 1996, prepared by the Natural Resources Conservation Service for the proposed Project site
- Letter dated November 29, 1996, from the District to ILDNR forwarding results of the Project's archeological investigation
- Letter dated November 29, 1996, from the District to the IHPA forwarding results of the Project's archeological investigation
- Letter dated December 6, 1996, from the IHPA stating compliance of the proposed Project with Section 106 of the NHPA of 1966
- Draft Fish and Wildlife Coordination Act Report, dated February 24, 1997, from the USFWS, Rock Island Field Office
- District Memorandum for Record, dated March 9, 1998
- District Letter, dated December 17, 2002, to the IHPA forwarding results of the Project's Phase II archeological investigations on a new pump station location
- Letter dated February 7, 2003, from the IHPA stating compliance of the new pump station location with Section 106 of the NHPA of 1966
- District Memorandum for Record, dated February 19, 2003
- District letter, dated March 28, 2003, to the IHPA forwarding the final report on the new pump station location
- Letter dated December 21, 2005, from Winnebago Tribe of Nebraska to the District DE
- Letter dated January 4, 20006, from USFWS, Rock Island Field Office, to District DE
- Letter dated January 6, 2006, from Sac and Fox Nation of Missouri in Kansas and Nebraska to the District DE
- Letter dated November 1, 2006, from the ILDNR regarding Project compliance with the State's floodway construction, dam safety, and public water rules
- Electronic message, dated October 29, 2009, from the ILDNR describing endangered and threatened species concerns

- Letter dated February 22, 2010, from the Eagle Nature Foundation providing comments on the Project's Public Review Draft DPR
- Letter dated February 25, 2010, from the Sierra Club, Heart of Illinois Group, providing comments on the Project's Public Review Draft DPR
- Letter dated March 2, 2010, from Mr. and Mrs. John Grigsby Sr. providing comments on the Project's Public Review Draft DPR
- Electronic message, dated March 5, 2010, from Ms. Jane Ward providing comments on the Project's Public Review Draft DPR
- Letter dated March 5, 2010, from Mr. Tom L. Edwards providing comments on the Project's Public Review Draft DPR
- District After Action Report, dated April 7, 2010, summarizing the Project's Public Open House held in Banner, Illinois, on January 27, 2010
- Letter dated April 9, 2010, from the ILDNR stating the Agency's support for the Project
- Electronic message, dated April 16, 2010, from the ILDNR detailing its Comprehensive Environmental Review Process approval of the Project
- Letter dated April 30, 2010, from the USFWS providing the Project's Final Fish and Wildlife Coordination Act report and Biological Opinion

14. CONCLUSIONS

The habitat value of the Rice Lake SFWA is not being fully realized due to frequent summer/fall flooding events that reduce food production and subsequent use by migrating birds. Critical ecosystem functions and services provided by wetland and floodplain habitats of the UMR-IWW ecosystem have been impaired or lost from the Project area in recent decades.

The recommended Project features (perimeter water control spillway, pump station and discharge channel, fish egress structures, and native mast-tree and herbaceous plantings) are designed to meet the Project's goal of restoring wetland, aquatic, and floodplain habitat by increasing the success ratio of moist-soil/emergent vegetation, improving fish egress from Rice Lake during drawdown conditions, and increasing food, shelter, and cover for migrating birds, resident birds, mammals, and other wildlife.

Assessment of the future with-project scenario shows definite increases in total habitat units over the 50-year project life for all evaluated species, as well as a majority of other wetland-dwelling species considered. These increases represent quantification of the projected outputs - improved habitat quality and increased preferred habitat quantity.

This Project is consistent with and fully supports the overall goal and objectives of the UMRS-EMP, the North American Waterfowl Management Plan, and the Partners in Flight program.

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

RECOMMENDATIONS

I have weighed the outputs to be obtained from the full implementation of *Rice Lake Habitat Rehabilitation and Enhancement Project* against its estimated cost and have considered the various alternatives proposed, impacts identified, and overall scope. In my judgment, this Project, as proposed, justifies expenditure of Federal funds. I recommend that the Mississippi Valley Division Engineer approve the proposed Project to include constructing a perimeter water control spillway and gatewell structure, constructing a 133,200 gpm pump station and discharge channel, installing water control structures, planting 57 acres of native herbaceous plants and 352 acres of mast trees, and installing two fish egress structures.

This Project will be constructed on state-owned lands and will require cost-sharing with the ILDNR as the NFS. Implementation will be cost shared 65 percent by the Federal government and 35 percent by the NFS. Total Project costs subject to cost sharing are $18,469,000. This total includes construction of the Project features, planning, engineering and design, construction management, and real estate. The NFS's 35 percent cost share is $6,464,000, which will be met using land credits totaling $7,465,000. The total Federal cost (65 percent) is $12,005,000. The OMRR&R of the Project is the responsibility of the NFS and is estimated to cost approximately $39,400 annually.

The recommendations contained herein reflect the information available at this time and current Department policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for implementation funding.

25 MAR 2011
(Date)

Shawn P. McGinley
Colonel, U.S. Army
Commander & District Engineer

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the information provided by this Environmental Assessment, along with data obtained from Federal and state agencies having jurisdiction by law or special expertise, and from the interested public. I find that the proposed habitat enhancement Project at the Rice Lake State Fish and Wildlife Area would not significantly affect the quality of the human environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination may be reevaluated if warranted by further developments.

An array of potential features and alternatives were considered for habitat enhancement. Features evaluated in detail were:

- No Federal Action
- Perimeter Levee
- New Pump Station and conveyance channel
- Native Mast Tree and Herbaceous Planting
- Fish Egress Structures

The preferred alternative consists of: constructing a perimeter levee with a top elevation of 442.0 and a spillway at elevation 440.0; constructing a new pump station and associated channels and structures to manage water levels on Big Lake and Rice Lake; converting cropland on Duck Island to native wet meadow and forest habitat by planting 57 acres to native herbaceous plant species and 352 acres to native mast-producing tree species; and constructing fish egress structures between Rice Lake and the Duck Island quarry, and between Goose Lake and the IWW.

Factors considered in making a determination that an Environmental Impact Statement was not required were as follows:

A. The Project is anticipated to produce a net increase in the value of the Rice Lake area for migratory and resident birds, fish, and wildlife species.

B. Aside from temporary disturbance during construction periods, no long-term significant adverse effects to natural or cultural resources are anticipated. No state or Federal endangered or threatened species would be adversely affected by the proposed action.

C. The Project is in compliance with Sections 401 and 404 of the Clean Water Act.

D. No significant economic or social impacts are expected to occur in the Project area.

5 May 2010
(Date)

Gary R Medin
for Shawn P. McGinley
Colonel, U.S. Army
District Engineer

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX A
CORRESPONDENCE

Contents **Page**

Illinois Department of Conservation
life and land together

LINCOLN TOWER PLAZA • 524 SOUTH SECOND STREET • SPRINGFIELD 62701-1787
CHICAGO OFFICE • ROOM 4-300 • 100 WEST RANDOLPH 60601
Michael B. Witte, Director • James C. Helfrich, Assistant Director

January 30, 1987

District Engineer
U.S. Army Engineer District, Rock Island
Attn: Planning Division, PD-R
Clock Tower Building
PO Box 2004
Rock Island, Illinois 61204-2004

Dear Sirs:

Enclosed is the appendix for the engineering and design of the proposed project at the Rice Lake Complex to be included in the Second Annual Addendum of the Environmental Management Program.

We are currently working on several other project scopes and should have them submitted to both your district and St. Louis by February 10, 1987. Should you have any questions, do not hesitate to call me.

Sincerely,

William R. Donels

William R. Donels
Landscape Architect
Division of Planning

cc: Gary McCandless
Bob Thornberry

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
GENERAL PLAN APPENDIX
FOR ENGINEERING AND DESIGN

RICE LAKE COMPLEX
LAGRANGE POOL, ILLINOIS RIVER
FULTON COUNTY, ILLINOIS

INTRODUCTION

Project Authority

The 1985 Supplemental Appropriation Act (Public Law 99-83) provides authorization and appropriations for an environmental management program for the Upper Mississippi River system that includes fish and wildlife habitat rehabilitation and enhancement. The proposed project would be funded under this authorization.

Project Location

The Rice Lake Complex is a series of natural backwater lakes geographically situated between river miles 132 and 138 of the LaGrange Pool of the Illinois River, 25 miles south of Peoria along U.S. Route 24 in Fulton County, IL.

Originally, the area consisted of 2639 acres of water and bottomland forest. Recently an additional 3053 acres were acquired to bring the total complex area to 5592 acres and managed by the State of Illinois, Department of Conservation.

Land and Water Acreage Composition:

3242	acres water
350	acres cultivated fields
2000	acres bottomland forest
5592	acres total

See Attachment 1

Resource Problems and Opportunities

Presently the increased flood and sedimentation levels within the Illinois River Valley and specifically Rice Lake Complex have resulted in the degradation of this historic mid-migration waterfowl and aquatic habitat as documented by the Illinois Natural History Survey's bulletin Vol. 32 Article 1, August 1979 entitled Waterfowl Populations and the Changing Environment of the Illinois River Valley.

This condition has necessitated the use of moist soil plant communities requiring water level manipulation by water control structures and low level levees. Up to recent years this practice has been successful, however current conditions will not guarantee annual food production whereas upon completion of this proposed project, food production will be guaranteed seven out of ten years for

the 2.7 million average annual waterfowl use days.

Additionally these properties provide a wide variety of habitat opportunities for numerous other migratory and resident species while water level manipulation associated with other moist soil management provides the habitat required for foraging by herrons egrets, and a mirade of shore birds.

The construction of islands will provide additional habitat diversity, improve water quality, and reduce resuspension of sediment caused by wind generated waves.

Proposed Solution

The proposed project would re-establish the Hate Levee to function as the major water impoundment structure and adjustable water control facility for the entire complex; construct a pumping facility on the Illinois River adjacent to old Lock #1, create discharge channels to supply water to the management areas, upgrade the riverside access road/levee for flood and sedimentation control during the 90 day moist soil management period, upgrade and establish interior levees to optimum moist soil management capabilities, and construct habitat islands for food production, additional mud flat area for shore and wading birds, waterfowl loafing, and reduce wind generated wave action causing resuspension of sediment adversely effecting water quality and acquatic environments.

The benefits of this project will insure quality habitat for not only migrating and resident waterfowl but for eagles, cormorant, and other endangered species which utilize the area.

See Attachment 2

PROJECT REQUIREMENTS

Estimated Engineering and Design Cost

The estimated costs for the engineering and design project are:

Hydraulic Analysis	$100,000.00
Surveying	50,000.00
Engineering and Design	250,000.00
Coordination/Project Preparation	40,000.00
TOTAL	$440,000.00

The planning, engineering, and design costs would be 100 percent Federal because the project's primary purpose is habitat improvement for migratory waterfowl. The Illinois Department of Conservation spent $1.3 million to acquire 3053 acres of additional habitat at the complex in FY'86 and FY'87.

The Illinois Department of Conservation has estimated project implementation costs to be $3,400,000.00. This cost estimate would be refined during the engineering and design phase.

Compliance with the Natural Environmental Policy Act of 1969 and other environmental laws and regulations would be documented during the engineering and design phase.

Project Participation

The primary project participants would be the Illinois Department of Conservation, U.S. Fish and Wildlife Service, and the Corps of Engineers.

Project Schedule

It is estimated that the engineering and design phase of their project could be completed within 8 months following receipt of funds.

RECOMMENDATION

I recommend that the Secretary of the Army provide $440,000.00 for the engineering and design for the Rice Lake Complex project under the Upper Mississippi River System Environmental Management Program.

William C. Burns
Colonel, Corps of Engineers
District Engineer


PEORIA
COUNTY
CANTON
HAWALTS
MONTEREY
BANNER
TAZEWELL
COUNTY
RICE LAKE
COMPLEX
LEWISTOWN
MAPLES MILL
BRYANT
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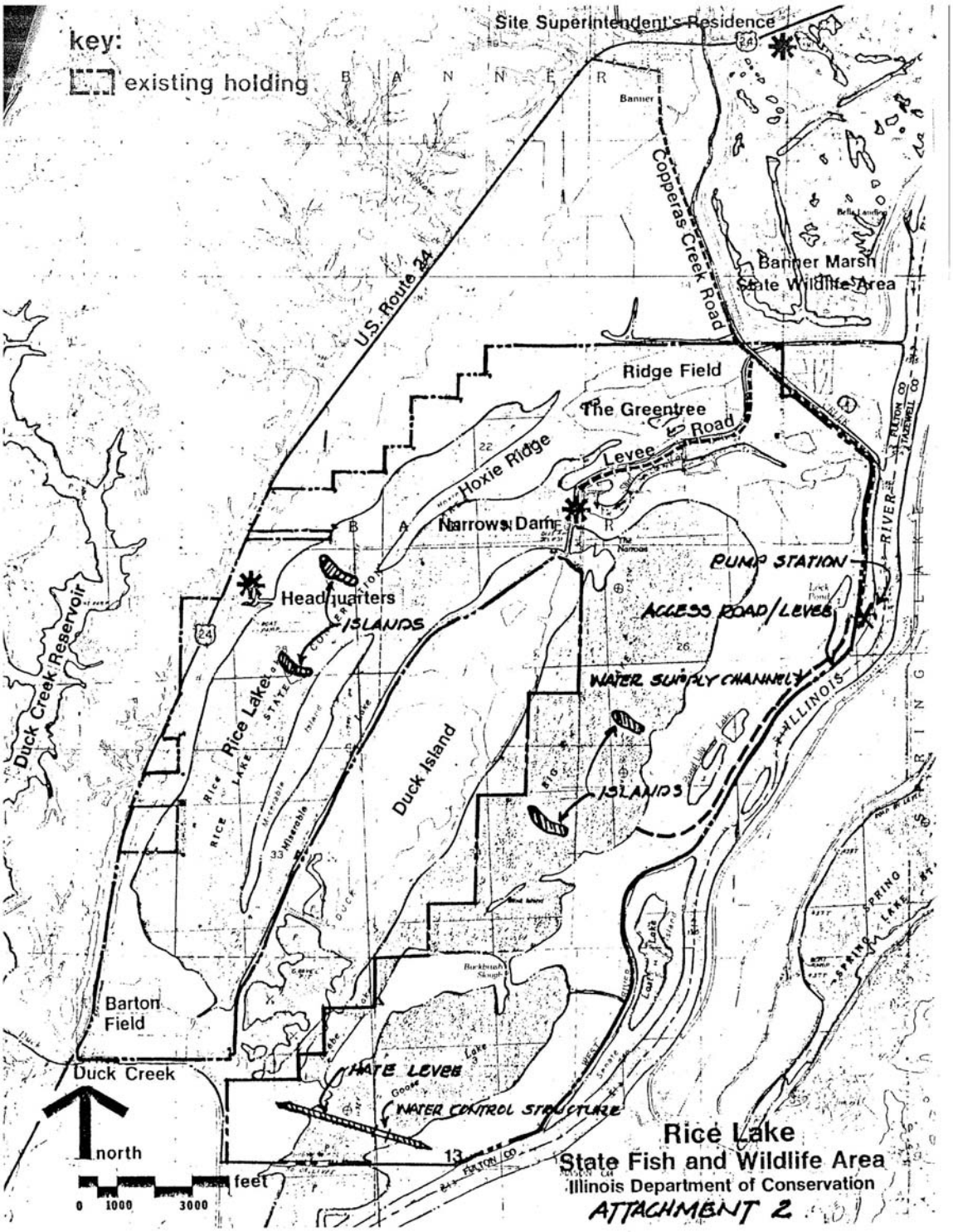
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existing holding
Site Superintendent's Residence
Banner
Copperas Creek Road
U.S. Route 24
Banner Marsh
State Wildlife Area
Ridge Field
The Greentree
Road
Levee
Hoxie Ridge
Narrows Dam
RIVER
PUMP STATION
Headquarters
ISLANDS
ACCESS ROAD/LEVEE
WATER SUPPLY CHANNEL
Duck Creek Reservoir
Rice Lake
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Duck Island
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ISLANDS
Barton
Field
Duck Creek
STATE LEVEE
WATER CONTROL STRUCTURE
north
feet
0 1000 3000
Rice Lake
State Fish and Wildlife Area
Illinois Department of Conservation
ATTACHMENT 2

DEISS/dmd/5185

June 29, 1995

Planning Division (1165-2-26a)

Ms. Anne Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has enclosed locational data for the Rice Lake Complex Habitat Rehabilitation and Enhancement Project (HREP), a part of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

The enclosed United States Geological Survey 1982 Duck Island Quadrangle Illinois 7.5 Minute Series (Topographic) map provides the proposed boundaries for the HREP. The HREP is authorized under Public Laws 99-88 and 99-662.

The Rice Lake Complex is a 5,592-acre series of natural backwater lakes situated between Illinois Waterway River Miles 132 and 138, approximately 25 miles south of Peoria, Illinois, in Fulton County. The historically excellent mid-migration waterfowl and aquatic habitat has degraded as a result of sedimentation. The proposed rehabilitation and enhancement would include private land purchases, levee repair, improvement of pumping facilities, island construction, and channel dredging.

We request the location of historic properties which may be affected by the proposed undertaking and a bibliography of pertinent archeological survey reports. The locational and bibliographical information will be used to (1) determine the effects to sites eligible to or listed on the National Register of Historic Places, (2) evaluate the area for its archeological potential, and (3) produce a physiographical data base for historic property resource assessments, management, and avoidance.

We request information and comments on this project within 30 days. If you should have questions concerning the Rice Lake Complex HREP, please call Mr. Ron Deiss of our Environmental Analysis Branch, telephone 309/795-5185, or write to our address above, ATTN: Planning Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY
PATRICK T. BURKE, P.E.

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure

Copies Furnished:

Mr. Harold Hassen
Illinois Department of Conservation
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787 (wo/enclosure)

Mr. Michael Wiant
Illinois State Museum
Research and Collections Lab
1920 South 10 1/2 Street
Springfield, Illinois 62703 (w/enclosure)

(all wo/encls):
Dist File (PD) (w/encl):
PD (Herrmann)
PD-E (Deiss) (w/encl)
PD-E (Carmack)
PD-E Jordan)
PD-W (Niles)
ED
ED-DN (Kimler)
ED-DN (Hoffman)
PP-M (Kowalczyk)

DEISS/dmd/5185

June 29, 1995

Planning Division (1165-2-26a)

Mr. Harold Hassen
Illinois Department
of Conservation
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787

Dear Mr. Hassen:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has enclosed a copy of locational data for the Rice Lake Complex Habitat Rehabilitation and Enhancement Project (HREP), a part of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

The enclosed United States Geological Survey 1982 Duck Island Quadrangle Illinois 7.5 Minute Series (Topographic) map provides the proposed boundaries for the HREP. The HREP is authorized under Public Laws 99-88 and 99-662.

The Rice Lake Complex is a 5,592-acre series of natural backwater lakes situated between Illinois Waterway River Miles 132 and 138, approximately 25 miles south of Peoria, Illinois, in Fulton County. The historically excellent mid-migration waterfowl and aquatic habitat has degraded as a result of sedimentation. The proposed rehabilitation and enhancement would include private land purchases, levee repair, improvement of pumping facilities, island construction, and channel dredging.

We request the location of historic properties which may be affected by the proposed undertaking and a bibliography of pertinent archeological survey reports. The locational and bibliographical information will be used to (1) determine the effects to sites eligible to or listed on the National Register of Historic Places, (2) evaluate the area for its archeological potential, and (3) produce a physiographical data base for historic property resource assessments, management, and avoidance.

We request information and comments on this project within 30 days. If you should have questions concerning the Rice Lake Complex HREP, please call Mr. Ron Deiss of our Environmental Analysis Branch, telephone 309/795-5185, or write to our address above, ATTN: Planning Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY
PATRICK T. BURKE, P.E.

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure

Copies Furnished:

Ms. Anne Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704 (wo/enclosure)

Mr. Michael Wiant
Illinois State Museum
Research and Collections Lab
1920 South 10 1/2 Street
Springfield, Illinois 62703 (wo/enclosure)

Dist File (PD) (all wo/encls):
PD (Herrmann)
PD-E (Deiss)
PD-E (Carmack)
PD-E Jordan)
PD-W (Niles)
ED
ED-DN (Kimler)
ED-DN (Hoffman)
PP-M (Kowalczyk)

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701–1507 • (217) 782–4836 • TTY (217) 524–7128

217/785-4997

FULTON COUNTY
Rice Lake Complex Habitat
Rehabilitation and Enchancement Project

PLEASE REFER TO:
IHPA LOG #950706004P-F

July 20, 1995

Mr. Dudley M. Hanson, P.E.
Dept of the Army/Rock Island Dist/CoE
Chief, Planning Division
Clock Tower Building/Post Office Box2004
Rock Island, Illinois 61204-2004

Gentlemen:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

It is our understanding that Dr. Harold Hassen will be providing the requested information for the above referenced project. We do not wish to duplicate his effort. However, should you require additional information please contact us and we will try to provide what assistance we can.

If you need additional information, please contact Joseph S. Phillippe, Staff Archaeologist, Illinois Historic Preservation Agency, Old State Capitol, Springfield, Illinois 62701, 217/785-1279.

Sincerely,

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:JSP

PD-E

CENCR-PD-W(1165-2-26a) 6 June 1996

MEMORANDUM FOR RECORD

SUBJECT: Upper Mississippi River System-Environmental Management Program (UMRS-EMP) Rice Lake, Illinois, Habitat Rehabilitation and Enhancement Project (HREP) General Coordination Meeting

1. The subject meeting was held on 5 February 1996 at the Illinois Department of Natural Resources' (ILDNR) Rice Lake Complex Offices. The following representatives from the Rock Island District (CENCR) and the ILDNR were in attendance:

Darron Niles	CENCR-PD-W	John Ball	ILDNR
Dan Johnson	CENCR-ED-DN	Dave Earleywine	ILDNR
Bob Hoffman	CENCR-ED-DN	Norman Emerick	ILDNR
Charlene Carmack	CENCR-PD-E	Rob Hilsabeck	ILDNR
Bob Lazenby	CENCR-RE-A	Mike Cochran	ILDNR
Bill Douglass	ILDNR	Carla Murray	ILDNR
Marvin Hubbell	ILDNR(by phone)		

2. The purpose of the meeting was to refine the proposed project features for ILDNR use in deciding whether to pursue purchasing Duck Island or recommending an alternate plan.

3. The following potential project features were discussed (see attached map):

a. Repairing the existing Hate Levee and constructing a low level berm at approximately a 442.0 elevation between the Hate Levee and an existing road bed upstream would provide water control and flood protection for the project area. Late season flood protection (June-September) is critical for growing migratory waterfowl food plants, which under current conditions is successful approximately 3 out of 10 years. The Hate levee would also include a rock overflow section at elevation 440.0. The low level berm would be a non-continuous structure that utilizes areas of higher elevation to minimize impacts to trees and reduce the required berming. Hate Levee repairs and low level berm construction would utilize adjacent borrow or channel maintenance sand from the Illinois Waterway.

b. In association with the Hate Levee repair, overflow and outlet structures would be constructed. The overflow structure would be sized to protect the levee from overtopping damage and constructed of rock. The outlet structure would reduce pumping costs by allowing gravity drainage of the project and also provide fish an escape route during drawdowns.

c. A pump station constructed near the old Copperas Creek Lock site is needed to provide water level control capability. Two scenarios for providing water level control are under study: 1) water is pumped into Big Lake first and then allowed to flow into Rice Lake through gated culverts at the existing quarry on

Duck Island; and 2) water is pumped into Rice Lake directly and the existing ILDNR 36'' pumps would be maintained for filling/draining Big Lake. The pump station size would vary according to the scenario selected. Channel excavation to Rice Lake and/or Big Lake is also needed. Along this channel, a stoplog structure or relocation of an existing pump would be incorporated into the plan to provide water level control capability to the Voorhees moist soil management unit.

d. If the ILDNR purchases Duck Island (1,200 acres), mast tree and cool/warm season grass plantings would be placed on the currently farmed land and the quarry on the downstream end of the island would be maintained as a deep water refuge for fish during drawdown periods. A refuge for fish during drawdowns may also reduce avian botulism problems caused by fishkills.

4. Required CENCR work items:

a. Old borings from coal mining surveys need to be obtained from the ILDNR engineering section (ED-DN).

b. A baseline and with and without project features WHAG analysis is needed (PD-E).

c. The impact on flood heights from construction of the low level berm need to be assessed (ED-HH).

d. A revised Project Appraisal Report and detailed cost and quantity estimates are needed before the next coordination meeting tentatively scheduled for July 1996 (ED-DN).

e. The ILDNR needs an interim cost estimate by March 1996 to determine what scale project they are able to support and to justify increasing their bonding authority to match the revised project features (ED-DN).

DARRON NILES
Waterway Systems Branch

Encl

Copies Furnished: (See Distribution List)

Dist File (PD)	
PD-W	ED-HQ
PD-W (Skalak)	ED-G
PD-W (Niles)	ED-DN
PD-E	ED-DN (Kimler)
PD-E (Carmack)	ED-DN (Hoffman)
PD-E (Bollman)	OD-T (DeVos)
PD-E (Deiss)	OD-I
ED	OD-IA
ED-H	PP-M (Kowalczyk)
ED-HH	

. Ross Adams
S. Fish and Wildlife Service
rk Twain National Wildlife Refuge
04 North 24th Street
incy, IL 62301

. John Barko
itional Biological Service - EMTC
'5 Lester Drive
alaska, WI 54650-8552

. Harlan Hirt
.S. Environmental Protection Agency
7 W. Jackson Blvd.
icago, IL 60604

essrs. Bill Douglass & John Ball
llinois Dept. of Natural Resources
ice Lake State Fish & Wildlife Area
.R. 3
anton, IL 61520

r. Wayne Fischer
.S. Fish and Wildlife Service
469-48th Avenue Court
ock Island, IL 61201

Ir. Marvin Hubbell
llinois Dept. of Natural Resources
incoln Tower Plaza
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Springfield, IL 62706

Ir. Wayne Herndon
llinois Dept. of Natural Resources
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Pekin, IL 61554

Mr. Norm Emerick
Illinois Dept. of Natural Resources
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Galesburg, IL 61401

Mr. Doug Blodgett
LTRM, Havana Field Station
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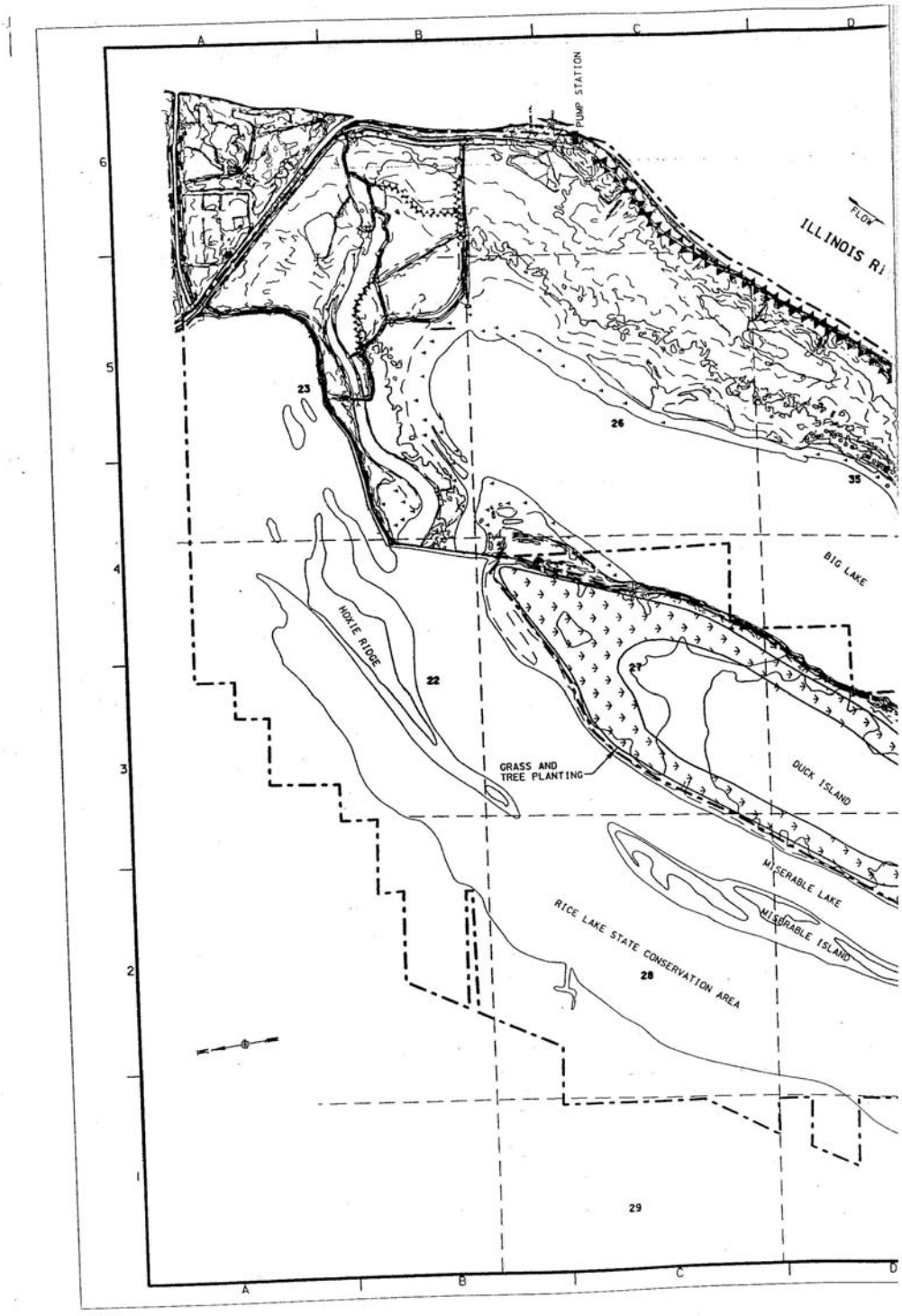
Havana, IL 62644

Mr. Tom Beissel
Illinois Dept. of Natural Resources
2612 Locust Street
Sterling, IL 61081

Mr. Bruce Yurdin
Illinois Environmental Protection Agen
2200 Churchill Road
Springfield, IL 62706

Messrs. Rob Hilsabeck & Dan Holm
Illinois Dept. of Natural Resources
215 N. Fifth Street, Suite D
Pekin, IL 61554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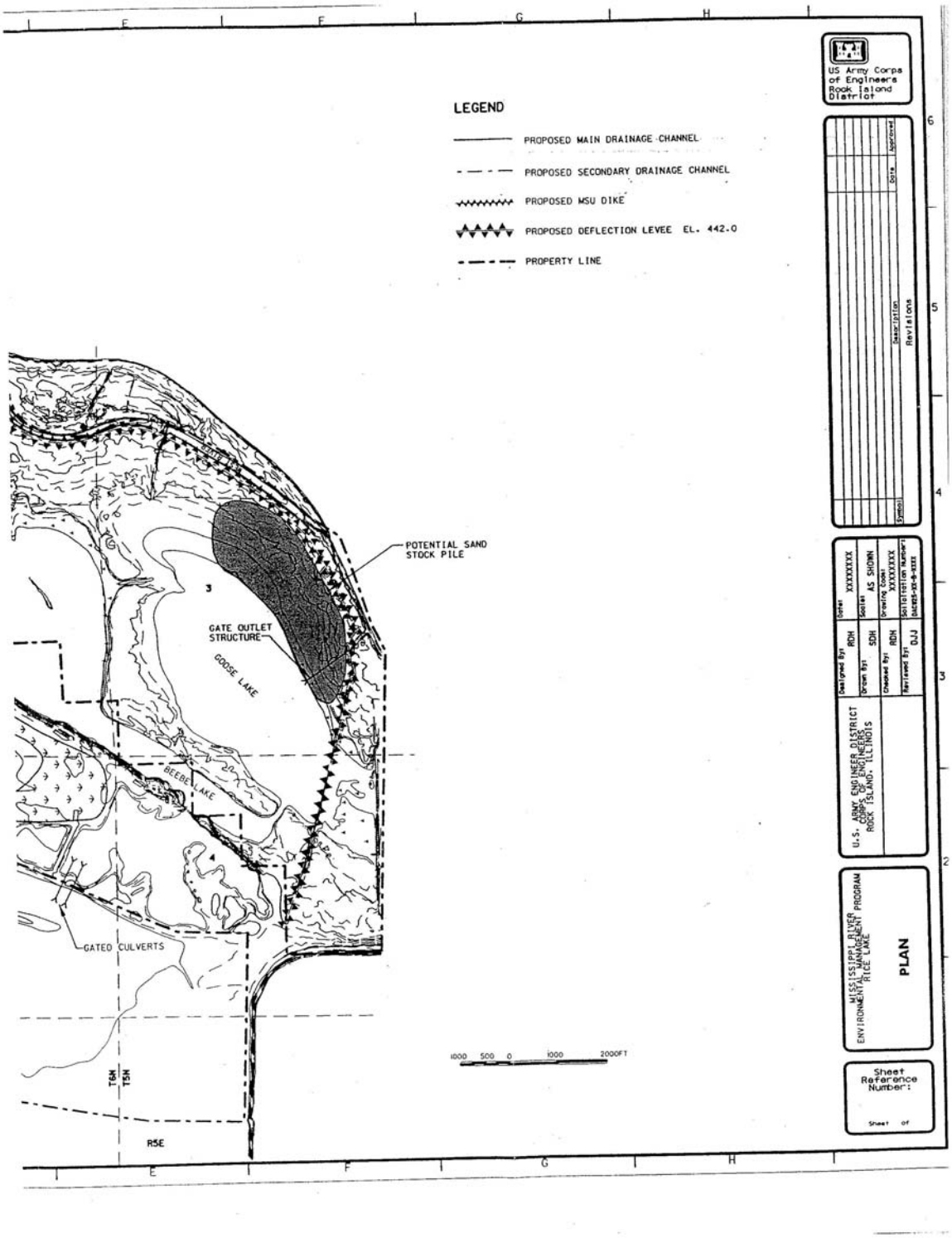
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US Army Corps of Engineers Rock Island District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS
MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAM RICE LAKE
PLAN
Sheet Reference Number:
Sheet of

CENCR-PD-W(1165-2-26a) 8 June 1996

MEMORANDUM FOR RECORD

SUBJECT: Upper Mississippi River System-Environmental Management Program (UMRS-EMP) Rice Lake and Banner Marsh, Illinois, Habitat Rehabilitation and Enhancement Projects (HREP)

1. The subject meeting was held on 23 January 1996 at the Illinois Department of Natural Resources' (ILDNR) Springfield office. The following representatives from the Rock Island District (CENCR) and the ILDNR were in attendance:

Paul Kowalczyk	CENCR-PP-M	Jim Garner	ILDNR
Darron Niles	CENCR-PD-W	Jerry Beverlin	ILDNR
Charlene Carmack	CENCR-PD-E	Kirby Cottrell	ILDNR
Bob Hoffman	CENCR-ED-DN	Jim Hoffman	ILDNR
Marvin Hubbell	ILDNR	Dave Earleywine	ILDNR
Bill Douglass	ILDNR	John Ball	ILDNR

2. The purpose of the meeting was to review the Rice Lake project scope and the status of the Banner Marsh project.

3. **RICE LAKE:** The Rice Lake Complex is a 5,600 acre series of natural backwater lakes located between river miles 132.0 and 138.0 on the Illinois Waterway's right bank, 25 miles south of Peoria, Illinois. The ILDNR is the project sponsor and non-federal cost sharing partner.

4. CENCR presented a revised cost estimate of ~$3,000,000 ($896,000 previously) for the minimum features required to construct a viable project. The features include: a deflection levee at elevation 442 that would incorporate existing levees and natural high ground, a rock overflow structure at elevation 440 on the Hate Levee section of the deflection levee, an outlet structure through the Hate levee to allow gravity drainage of the project, and a pump station to provide water control (see attached map).

5. In addition to the minimum project features, the ILDNR will assess the possibility of purchasing Duck Island (1200 acres) to increase the benefits produced from the project features identified and to provide a terrestrial component to the project. The island currently hampers management efforts by dividing the Rice Lake Management Area. If purchased by the ILDNR, mast tree and warm/cool season grass planting features would be incorporated into the proposed project. Purchasing the island, now rather than later, would benefit the ILDNR because the acquisition costs incurred now would be credited toward the cost sharing requirement for the project.

6. The ILDNR will pursue additional bonding authority in response to the revised cost estimate. The current bonding of $177,000 would need to increase to between $500,000 and $750,000.

7. An additional coordination meeting at Rice Lake was proposed for 5 February 1996 to review updated cost estimates and refine the proposed project features. The ILDNR will discuss the results of this meeting internally before deciding whether to pursue purchasing Duck Island or recommending an alternate plan.

8. The current schedule for Rice Lake Definite Project Report (DPR) preparation and project construction is as follows:

Draft DPR	November 1996*
Public Review Draft DPR	January 1997
Final DPR to CENCD	March 1997
Construction Approval	November 1997*
Complete Plans and Specs	January 2000*
Contract Award	August 2000*
Complete Construction	September 2002

* Schedule changes since 5 February 1996 meeting.

9. **BANNER MARSH:** The final DPR is being reviewed by HQUSACE before being forwarded to ASA(CW) for approval (received 28 May 1996). Preliminary indications are that the report looks good and will be approved soon. However, due to budgetary difficulties awarding of the construction contract has been delayed until June 1999.

10. Since project construction will be delayed, the ILDNR will pursue a Section 215 agreement in advance of the EMP project as a solution to the immediate repairs needed for sections of the perimeter levee. Once construction is initiated, the ILDNR would receive credit toward their cost sharing requirement for the advance work performed. The ILDNR currently has ~$1.1 million available for this work. CENCR would supply the plans and specs for the levee repair effort. CENCR-ED-DN will also give the ILDNR a cost estimate for repairing the worst levee sections.

11. **OTHER TOPICS:**

a. Performance Evaluation (PE) Reports: CENCR requested that the ILDNR forward pertinent data associated with EMP projects for inclusion in future PE reports, especially biological information (CENCR performs physical parameter monitoring). The ILDNR said they would pursue this with their personnel and the LTRM field stations.

b. Dedication Ceremonies: CENCR personnel stated that they would support the ILDNR if they wanted to hold dedication ceremonies at the recently completed projects (Andalusia Refuge, Peoria Lake, or Potters Marsh). The ILDNR said they may have an interest in arranging these, but could not commit to them at this time.

DARRON NILES
Waterway Systems Branch

Encl

Copies Furnished: (See Distribution List)

Dist File (PD)
PD-W
PD-W (Skalak)
PD-W (Niles)
PD-E
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PP-M (Kowalczyk)

Mr. Ross Adams
U.S. Fish and Wildlife Service
Mark Twain National Wildlife Refuge
1704 North 24th Street
Quincy, IL 62301

Mr. John Barko
National Biological Service - EMTC
575 Lester Drive
Onalaska, WI 54650-8552

Mr. Harlan Hirt
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, IL 60604

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Rice Lake State Fish & Wildlife Area
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Canton, IL 61520

Mr. Wayne Fischer
U.S. Fish and Wildlife Service
1469-48th Avenue Court
Rock Island, IL 61201

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Springfield, IL 62706

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Pekin, IL 61554

Mr. Norm Emerick
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ERM, Havana Field Station
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Mr. Tom Beissel
Illinois Dept. of Natural Resources
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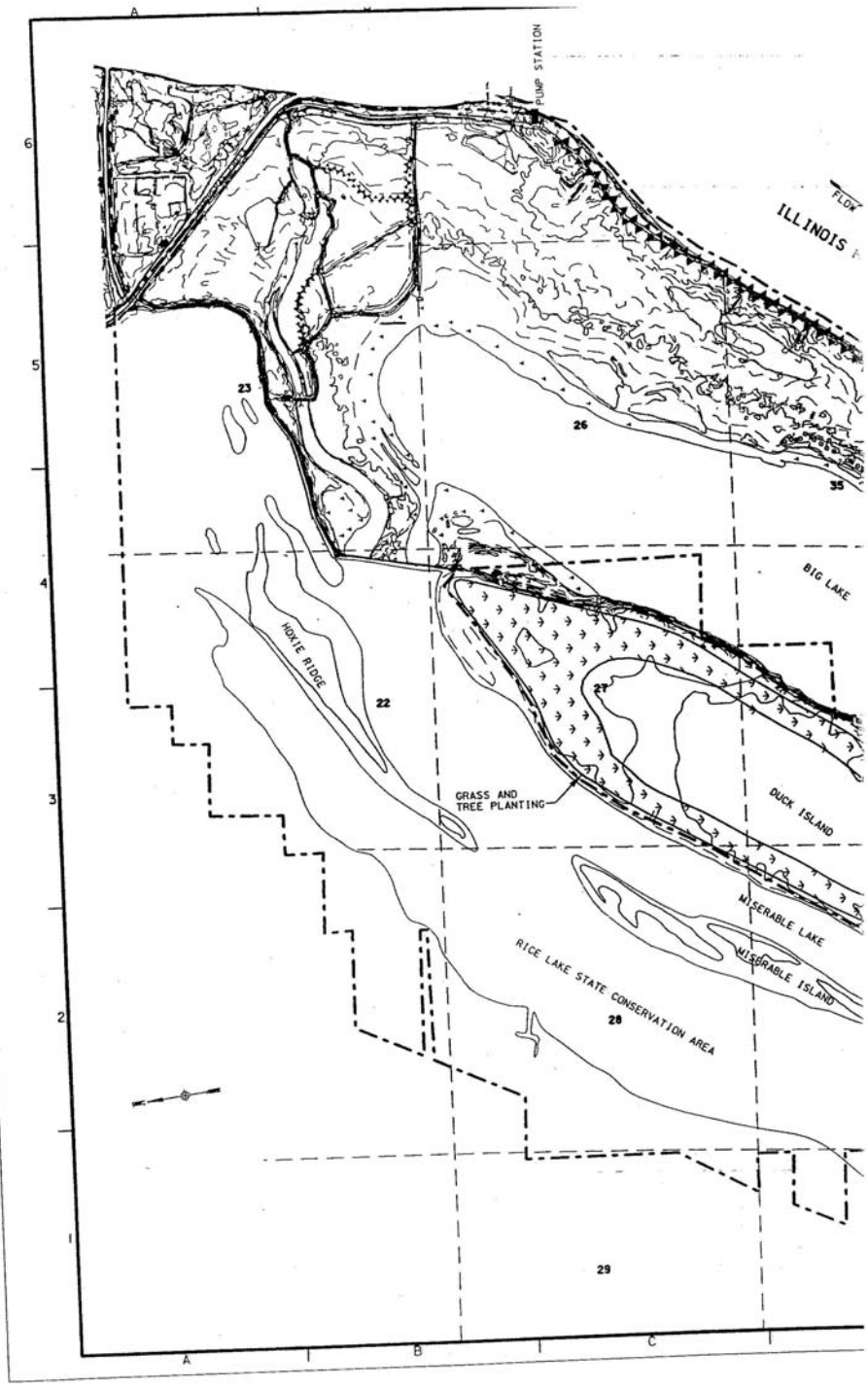
Illinois Dept. of Natural Resources
215 N. Fifth Street, Suite D
Pekin, IL 61554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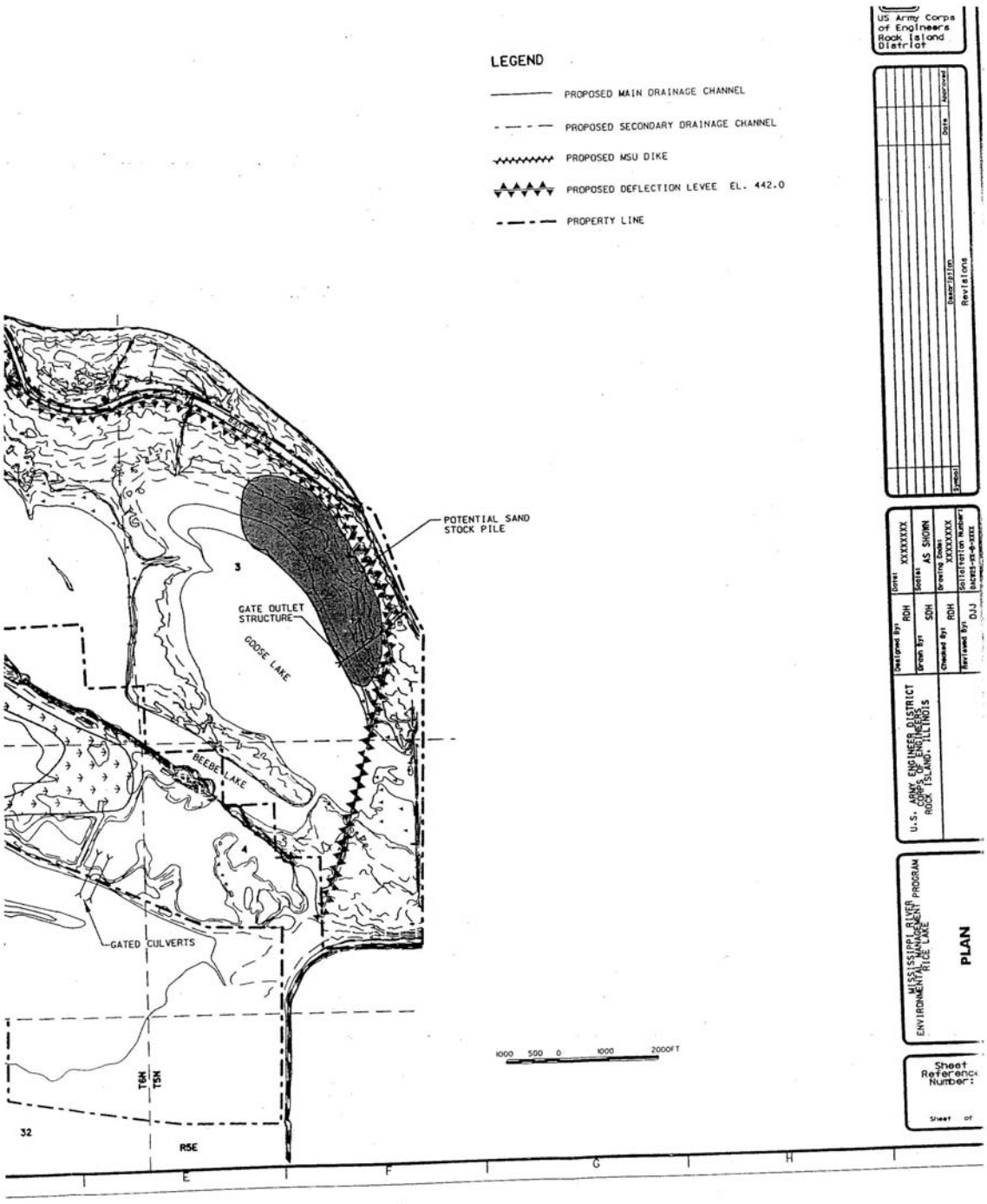
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US Army Corps of Engineers Rock Island District
Revisions
Description
Date
Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS
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Drawn by SDH
Checked by RDH
Reviewed by DJJ
Scale: AS SHOWN
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Solicitation Number: DACW25-XX-B-XXXX
MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAM
RICE LAKE
PLAN
Sheet Reference Number:
Sheet of

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING — P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:

September 9, 1996

Planning Division

SEE DISTRIBUTION LIST

The Rock Island District of the U.S. Army Corps of Engineers (Corps) is currently preparing a Definite Project Report (DPR) with Environmental Assessment (EA) for the rehabilitation of Rice Lake State Fish and Wildlife Area (SFWA), Illinois. Rice Lake has been funded for design as a Habitat Rehabilitation and Enhancement Project of the Upper Mississippi River System - Environmental Management Program under authority of the Water Resources Development Act of 1986. In accordance with the provisions of Section 906(e) of the Water Resources Development Act of 1986 (Public Law 99-662), cost sharing for general design and construction would be 75 percent Federal/25 percent non-Federal. The non-Federal sponsor for this project would be the Illinois Department of Natural Resources (ILDNR).

The Rice Lake SFWA is a 5,592-acre complex of natural backwater lakes and wetlands located on the right descending bank of the Illinois River between River Mile 132 and 138, in Fulton County, Illinois (see enclosed location map). The project area is owned by the State of Illinois and is managed as a conservation area. The historically excellent mid-migration waterfowl and aquatic habitat has declined in recent years as a result of sedimentation.

The overall goal of the Habitat Rehabilitation and Enhancement Project for the Rice Lake SFWA is the restoration of wetland habitat. The following objectives have been identified to meet the restoration goal: (1) increase the rate of success of submergent/emergent aquatic vegetation; (2) increase food and shelter for wildlife; (3) provide egress for fish from Rice Lake during drawdown periods; and (4) improve bottomland hardwood and native cool season grass diversity and quality. Several rehabilitation measures to meet the identified objectives will be addressed and evaluated in the DPR and EA. These measures are shown on the enclosed preliminary plan and described in the following paragraphs:

a. Reestablishment of the existing Hate Levee at the downstream end of the project area and construction of a low level deflection dike along the riverward perimeter of the project area. This measure would increase the rate of success of submergent/emergent vegetation and provide more reliable food production for migratory birds.

b. Excavation of channels, construction of low level dikes, construction of a pump station, and construction of an outlet structure in the northeastern portion of the project area currently managed for production of moist soil vegetation. These measures would increase the ability to manage water levels in the area and improve habitat for herons, egrets, and shorebirds at critical times during the year.

c. Construction of gated culverts for fish egress from Rice Lake. This measure would increase the availability of deepwater habitat to fish in the project area and reduce fish kills related to the drawdown of Rice Lake, thereby reducing the occurrence of avian botulism which has been a serious problem in Rice Lake. Implementation of this measure and the measure described in paragraph (d) below would require the ILDNR to purchase lands or easements on Duck Island, a private inholding within the SFWA.

d. Planting mast producing trees such as pin oak, bur oak, swamp white oak, pecan, and sycamore, and cool season grasses on Duck Island. This measure would improve habitat value for wildlife by increasing the occurrence of mast-producing trees in the project area which is currently dominated by silver maple and cottonwood.

The overall effect of the project is expected to be beneficial to wetland habitat with no significant adverse impacts to the quality of the human environment. While construction of project features will initially affect some existing habitat within the project area, anticipated increases in habitat values throughout the area should offset any negative impacts. The proposed project will be compatible with the Natural Resources Management Plan developed by the ILDNR for the Rice Lake SFWA. Because several of the potential project features would require placement of fill material into waters of the U.S., the project will require processing under Section 404 of the Clean Water Act.

We request your preliminary comments concerning the proposed project within 30 days of the date of this letter. Additional opportunities to comment will be provided as part of our processing of the draft and public review DPR's for the subject project. Distribution of these documents is currently scheduled for November 1996 and February 1997, respectively.

If you have any questions or need additional information, please call Ms. Charlene Carmack of our Environmental Analysis Branch, telephone 309/794-5570. Written comments may be sent to our address above, ATTN: Planning Division (Charlene Carmack).

Sincerely,

SIGNED BY
F[illegible]E, P.E.

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosures

Copies Furnished:

Mr. Bill Douglass
Illinois Department of Natural Resources
Rice Lake State Fish and Wildlife Area
R.R. 3, Box 91
Canton, Illinois 61520 (w/enclosures)

Mr. Marvin Hubbell
Illinois Department of Natural Resources
524 South Second Street
Third Floor, Room 310
Springfield, Illinois 62706 (w/enclosures)

DISTRIBUTION LIST

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Illinois Department of Natural Resources
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Mr. Norman Emerick
Illinois Department of Natural Resources
2100 South Lake Story Road
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Illinois Department of Natural Resources
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Illinois Natural History Survey
LTRM Field Station
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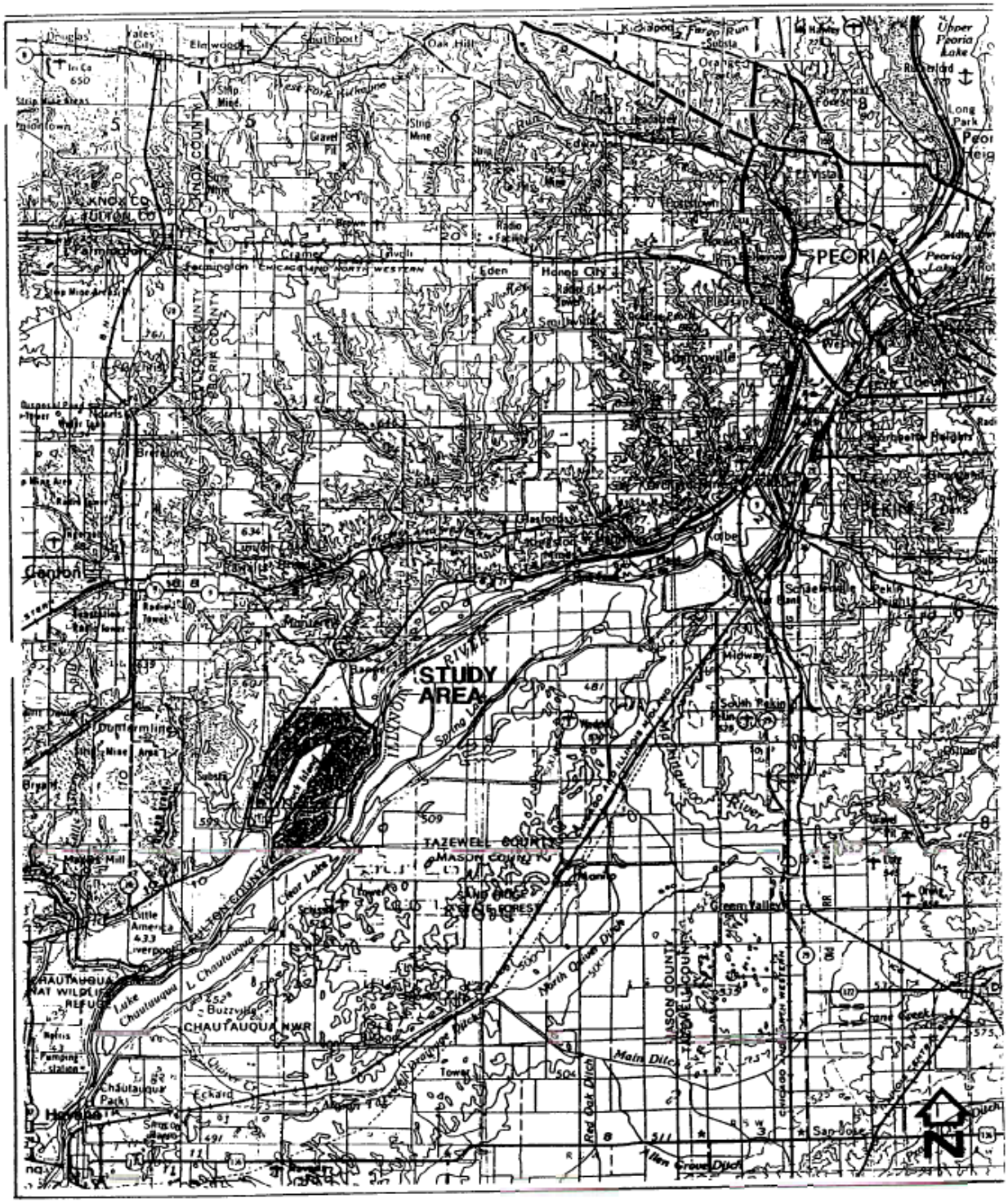
Springfield, Illinois 63101

Mr. Dennis Kennedy
Senior Water Resources Engineer
Illinois Department of Natural Resources
Office of Water Resources
3215 Executive Park Drive
P.O. Box 19484
Springfield, Illinois 62794



LOCATION MAP

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING — P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:

September 10, 1996

Planning Division (1165-2-26a)

Mr. Harold Hassen
Illinois Department
of Conservation
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787

Dear Mr. Hassen:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has enclosed the Scope of Work (SOW) for a Phase I Intensive Archeological Survey for Historic Properties for the Rice Lake Complex Habitat Rehabilitation and Enhancement Project (HREP). The HREP is a part of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

The SOW was awarded to Illinois State Museum, Springfield, Illinois. The SOW may be useful in your department's review and comment on our reports, necessary in meeting our requirements promulgated under Section 106 of the National Historic Preservation Act of 1966, as amended.

If you should have questions concerning the Rice Lake Complex HREP or the Phase I archeological survey and contract, please call Mr. Ron Deiss of our Environmental Analysis Branch, telephone 309/795-5185, or write to our address above, ATTN: Planning Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY
P. BURKE

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure

Copies Furnished:

Ms. Anne Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704 (wo/enclosure)

Mr. Michael Wiant
Illinois State Museum
Research and Collections Lab
1920 South 10 1/2 Street
Springfield, Illinois 62703 (wo/enclosure)

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING — P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

September 10, 1996

Planning Division (1165-2-26a)

Ms. Anne Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704

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If you should have questions concerning the Rice Lake Complex HREP or the Corps' Phase I archeological survey and contract, please call Mr. Ron Deiss of our Environmental Analysis Branch, telephone 309/795-5185, or write to our address above, ATTN: Planning Division (Ron Deiss).

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DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING — P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:

October 11, 1996

Planning Division

Mr. Robert McLeese
State Soil Scientist
U.S. Department of Agriculture
Natural Resource
Conservation Service
1902 Fox Drive
Champaign, Illinois 61820

Dear Mr. McLeese:

The Rock Island District of the U.S. Army Corps of Engineers is currently preparing a Definite Project Report (DPR) with Environmental Assessment (EA) for the rehabilitation of Rice Lake State Fish and Wildlife Area (SFWA), Illinois. Rice Lake has been funded for design as a Habitat Rehabilitation and Enhancement Project of the Upper Mississippi River System - Environmental Management Program under authority of the Water Resources Development Act of 1986.

In accordance with the provisions of Section 906(e) of the Water Resources Development Act of 1986 (Public Law 99-662), cost sharing for general design and construction would be 75 percent Federal/25 percent non-Federal. The non-Federal sponsor for this project would be the Illinois Department of Natural Resources (ILDNR).

The Rice Lake SFWA is a 5,592-acre complex of natural backwater lakes and wetlands located on the right descending bank of the Illinois River between River Mile 132 and 138, in Fulton County, Illinois (see Enclosure 1). The project area is owned by the State of Illinois and is managed as a conservation area.

The overall goal of the Habitat Rehabilitation and Enhancement Project for the Rice Lake SFWA is the restoration of wetland habitat. The following objectives have been identified to meet the restoration goal: (1) increase the rate of success of submergent/emergent aquatic vegetation; (2) increase food and shelter for wildlife; (3) provide egress for fish from Rice Lake during drawdown periods; and, (4) improve bottomland hardwood and native warm season grass diversity and quality.

Several measures to accomplish these objectives are currently being evaluated for the DPR. Measures to fully accomplish objectives 2, 3, and 4 above would require acquisition by the ILDNR of the Duck Island property. This property was identified in the ILDNR's 1989 Natural Resource Management Plan for the Rice Lake SFWA as a top priority for acquisition.

The Duck Island peninsula is located in portions of Sections 27, 28, 33, and 34, Township 6 North, Range 5 East, and a portion of Section 4, Township 5 North, Range 5 East, Fulton County, Illinois. This privately owned inholding is surrounded on all sides by the Rice Lake SFWA, with the exception of a narrow corridor bordering the access road. The total area of the property that would be acquired is approximately 1,200 acres. Approximately 600 acres of this property is leased for farming. The remaining acreage is a combination of open water areas in Big Lake, wooded areas, and a gravel quarry at the southern end of the peninsula.

Potential habitat enhancement features being evaluated include planting mast producing trees and warm season grasses on approximately 300 acres of the farmed land. The remaining farmed land, approximately 300 acres, would continue to be managed under agricultural leases and would not be converted to wildlife habitat.

Draft soil survey maps provided by the Lewistown District office are enclosed as Enclosures 2 and 3. Additional soil survey information was provided by the Jacksonville District office (Enclosure 4).

By submittal of the enclosed Form AD-1006 (Enclosure 5), we request a determination from your office as to whether the proposed project site contains farmland subject to the provisions of the Farmland Protection Policy Act of 1981. The DPR and EA being prepared for this action will be provided to your office for review.

We request that you return the completed Form AD-1006 to us within 45 days of the date of this letter.

If you have any questions, please call Ms. Charlene Carmack of our Environmental Analysis Branch, telephone 309/794-5570. Written comments may be sent to our address above, ATTN: Planning Division (Charlene Carmack).

Sincerely,

ORIGINAL SIGNED BY

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosures

Copies Furnished:

Mr. Bill Douglass
Illinois Department of Natural Resources
Rice Lake State Fish and Wildlife Area
R.R. 3, Box 91
Canton, Illinois 61520 (w/enclosures)

Mr. James Hartwig
Illinois Department of Agriculture
Division of Natural Resources
State Fairgrounds
P.O. Box 19281
Springfield, Illinois 62794 (w/enclosures)

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request: October 11, 1996
Name Of Project: Rice Lake State Fish and Wildlife Area	Federal Agency Involved: U.S. Army Corps of Engineers, Rock Island
Proposed Land Use: State Conservation/Refuge Area	County And State: Fulton County, Illinois
PART II *(To be completed by SCS)*	Date Request Received By SCS: 10-24-96

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply — do not complete additional parts of this form).* Yes ☒ No ☐		Acres Irrigated: —	Average Farm Size: 321
Major Crop(s): Corn, Soybeans, Wheat, Hay	Farmable Land In Govt. Jurisdiction Acres: 29,633,500 % 97	Amount Of Farmland As Defined in FPPA Acres: 27,695,900 % 91	
Name Of Land Evaluation System Used: Illinois	Name Of Local Site Assessment System: Statewide	Date Land Evaluation Returned By SCS: 11-5-96	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating: Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	300			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	1200			
PART IV *(To be completed by SCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	290			
B. Total Acres Statewide And Local Important Farmland	10			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.001			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	56.9			
PART V *(To be completed by SCS)* Land Evaluation Criterion: Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	81			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	20	20			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	15	15			
6. Distance To Urban Support Services	15	10			
7. Size Of Present Farm Unit Compared To Average	10	10			
8. Creation Of Nonfarmable Farmland	10	10			
9. Availability Of Farm Support Services	5	3			
10. On-Farm Investments	20	10			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	5			
TOTAL SITE ASSESSMENT POINTS	160	128			
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	81			
Total Site Assessment *(From Part VI above or a local site assessment)*	160	128			
TOTAL POINTS *(Total of above 2 lines)*	260	209			

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☒ No ☐

Reason For Selection:

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING — P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

November 29, 1996

Planning Division (1165-2-26a)

Mr. Harold Hassen
Chief Archeologist
Illinois Department
of Conservation
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787

Dear Mr. Hassen:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has been coordinating with the Department of Natural Resources concerning the Rice Lake Complex Habitat Rehabilitation and Enhancement Project (HREP). The HREP is a part of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

Coordination with your agency is promulgated under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. In compliance with NHPA, the Corps contracted a Scope of Work (SOW) with the Illinois State Museum, Springfield, Illinois, to conduct a Phase I survey for historic properties. The SOW was provided to your agency to aid in review and comment on our reports.

The attached draft report (Attachment 1) is provided for your review and comment. The report, entitled Phase I Intensive Archaeological Survey for Historic Properties Within the Upper Mississippi River System-Environmental Management Program (UMRS-EMP) for the Rice Lake State Conservation Area, Fulton County, West-Central, Illinois--Draft (archeology draft report), dated November 1996, was prepared by the Illinois State Museum, Springfield, Illinois, under Corps Indefinite Quantities Contract Number DACW25-93-D-0014, Delivery Order Number 17. Page 25 of the archeology draft report documents 27 archaeological sites, including 7 prehistoric isolates finds, 14 prehistoric sites, 1 historic site, and 5 mixed component historic and prehistoric sites, and that 4 of these sites are potentially eligible to the National Register of Historic Places (Site 11F2745, Site 11F2746, Site 8, and Site 23).

Following the recommendations of the report, the Corps will provide a 30-meter easement along the perimeter of Sites 11F2745, 11F2746, Site 8, and Site 23, so that (1) the planting of trees with power planters does not impact the four sites and (2) the roots of future mature trees do not grow into the sites (p. 25).

The Corps has determined that the Copperas Creek Lock is individually eligible for listing to the National Register of Historic Places (NRHP) under Criteria A and C. This lock was constructed by the Corps and the State of Illinois between 1873 and 1877 as part of the Illinois River navigation improvement and is presently owned by the city of Canton, Illinois. The history and significance of this lock and the NRHP eligible Multiple Property Chicago to Grafton, Illinois, Navigable Water Link, 1836-1945, is extensively documented in the Corps' June 1996 report entitled Architectural and Engineering Resources of the Illinois Waterway Between 130th Street in Chicago and La Grange, Volume I (architectural draft report) prepared by American Resources Group Ltd., Carbondale, Illinois, under Indefinite Quantities Contract Number DACW25-93-D-0012, Delivery Order Number 23. A copy of the draft architectural report has been provided for your files and your agency concurred with the findings by letter dated November 4, 1996 (Attachment 2).

Two separate locations have been studied for the location of the proposed Rice Lake UMRS-EMP Pump Station. The preferred location is located approximately 100 meters from the closest point of the Copperas Creek Lock and buffered by mature trees and undergrowth (Attachment 3). Those significant characteristics of the Copperas Creek Lock under Criteria A and C (as documented within the architectural draft report) will remain. The primary visual boundaries of the lock are between the ground surface and waterline, while the proposed Pump Station will be visually hidden from Copperas Creek Lock by vegetation, an unobtrusive color to blend into surrounding vegetation, and have a low profile well below extant tree height.

By applying the Criteria of Effect under 36 CFR Part 800.9(a): "Protection of Historic Properties," the Corps determines that **No Effect** to the NRHP eligible Copperas Creek Lock would occur from the construction of the Rice Lake Complex HREP Project and Pump Station.

Please provide your comments or concurrence with the recommendations and findings of this archeological draft report, as promulgated under Section 106 of the NHPA, and determination of **No Effect** pursuant to 36 CFR Part 800.5(b). If no comments

or objections are made within 30 days after receipt of this letter, the Corps will assume your concurrence with the findings, recommendations and determination, and proceed with the Rice Lake Complex HREP, as proposed.

If you should have questions concerning the Rice Lake Complex HREP, the Corps' Phase I archeological survey and contract, or the determination of **No Effect** to the NRHP eligible Copperas Creek Lock, please call Mr. Ron Deiss of our Environmental Analysis Branch, telephone 309/795-5185, or write to our address above, ATTN: Planning Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY
P. BURKE

Dudley M. Hanson, P.E.
Chief, Planning Division

Attachments

Copies Furnished:

Ms. Anne Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704 (wo/attachments)

Mr. Bill Douglas
Site Manager
Rice Lake State Fish and Wildlife Area
19721 North U.S. 24
Canton, Illinois 61520 (wo/attachments)

Mr. Michael Wiant
Museum Director
Illinois State Museum
Research and Collections Lab
1920 South 10 1/2 Street
Springfield, Illinois 62703 (wo/attachments)

Copies Furnished (Continued):

Mr. Robert Anderson
City Engineer
6 East Elm Street
Canton, Illinois 61520 (wo/attachments)

Mr. Donald Edwards
Mayor
City Hall
210 East Chestnut
Canton, Illinois 61520 (wo/attachments)

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING — P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

November 29, 1996

Planning Division (1165-2-26a)

Ms. Anne Haaker
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has been coordinating with your agency concerning the Rice Lake Complex Habitat Rehabilitation and Enhancement Project (HREP). The HREP is a part of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

Coordination with your agency is promulgated under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. In compliance with NHPA, the Corps contracted a Scope of Work (SOW) with the Illinois State Museum, Springfield, Illinois, to conduct a Phase I survey for historic properties. The SOW was provided to your agency to aid in review and comment on our reports.

The attached draft report (Attachment 1) is provided for your review and comment. The report, entitled Phase I Intensive Archaeological Survey for Historic Properties Within the Upper Mississippi River System-Environmental Management Program (UMRS-EMP) for the Rice Lake State Conservation Area, Fulton County, West-Central, Illinois--Draft (archeology draft report), dated November 1996, was prepared by the Illinois State Museum, Springfield, Illinois, under Corps Indefinite Quantities Contract Number DACW25-93-D-0014, Delivery Order Number 17. Page 25 of the archeology draft report documents 27 archaeological sites, including 7 prehistoric isolates finds, 14 prehistoric sites, 1 historic site, and 5 mixed component historic and prehistoric sites, and that 4 of these sites are potentially eligible to the National Register of Historic Places (Site 11F2745, Site 11F2746, Site 8, and Site 23).

Following the recommendations of the report, the Corps will provide a 30-meter easement along the perimeter of Sites 11F2745, 11F2746, Site 8, and Site 23, so that (1) the planting of trees with power planters does not impact the four sites and (2) the roots of future mature trees do not grow into the sites (p. 25).

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Two separate locations have been studied for the location of the proposed Rice Lake UMRS-EMP Pump Station. The preferred location is located approximately 100 meters from the closest point of the Copperas Creek Lock and buffered by mature trees and undergrowth (Attachment 3). Those significant characteristics of the Copperas Creek Lock under Criteria A and C (as documented within the architectural draft report) will remain. The primary visual boundaries of the lock are between the ground surface and waterline, while the proposed Pump Station will be visually hidden from Copperas Creek Lock by vegetation, an unobtrusive color to blend into surrounding vegetation, and have a low profile well below extant tree height.

By applying the Criteria of Effect under 36 CFR Part 800.9(a): "Protection of Historic Properties," the Corps determines that **No Effect** to the NRHP eligible Copperas Creek Lock would occur from the construction of the Rice Lake Complex HREP Project and Pump Station.

Please provide your comments or concurrence with the recommendations and findings of this archeological draft report, as promulgated under Section 106 of the NHPA, and determination of **No Effect** pursuant to 36 CFR Part 800.5(b). If no comments

or objections are made within 30 days after receipt of this letter, the Corps will assume your concurrence with the findings, recommendations and determination, and proceed with the Rice Lake Complex HREP, as proposed.

If you should have questions concerning the Rice Lake Complex HREP, the Corps' Phase I archeological survey and contract, or the determination of **No Effect** to the NRHP eligible Copperas Creek Lock, please call Mr. Ron Deiss of our Environmental Analysis Branch, telephone 309/795-5185, or write to our address above, ATTN: Planning Division (Ron Deiss).

Sincerely,

Dudley M. Hanson, P.E.
Chief, Planning Division

Attachments

Copies Furnished:

Mr. Harold Hassen
Chief Archeologist
Illinois Department of Conservation
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787 (wo/attachments)

Mr. Bill Douglas
Site Manager
Rice Lake State Fish and Wildlife Area
19721 North U.S. 24
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Museum Director
Illinois State Museum
Research and Collections Lab
1920 South 10 1/2 Street
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6 East Elm Street
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Mr. Donald Edwards
Mayor
City Hall
210 East Chestnut
Canton, Illinois 61520 (wc/attachments)

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1507 • (217) 782-4836 • TTY (217) 524-7128

Fulton County
Rice Lake State Conservation Area
COERi-Rice Lake Habitat Rehabilitation and Enhancement Project (HREP)-Upper Mississippi River System-Environmental Management Program (UMRS-EMP)
Copperas Creek Lock; Site 11F2746, Site 11F2745, Site 8, Site 23
DACW25-93-D-0014
IHPA Log #04120596, #961205001P-F

December 6, 1996

Dudley Hanson, P.E., Chief, Planning Div
Department of the Army
Rock Island District, Corps of Engineers
Clock Tower Bldg., P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Mr. Hanson:

We have reviewed the referenced project. The Copperas Creek Lock is eligible for listing on the National Register of Historic Places. Archaeological Site 11F2745, Site 11F2746, Site 8 and Site 23 are potentially eligible for listing on the National Register.

In our opinion the project, as proposed, will have no effect on sites or structures eligible or potentially eligible for listing on the National Resgister of Historic Places. Specifically, the proposed pump station construction near Copperas Creek Lock as outlined in your November 29, 1996 letter will not affect those qualities which make the structure eligible.

Additionally, the avoidance of Archaeological Site 11F2745, Site 11F2746, Site 8 and Site 23, as recommended in the draft "Phase I Intensive Archaeological Survey for Historic Properties within the Upper Mississippi River System-Environmental Management Program (UMRS-EMP) for the Rice Lake State Conservation Area, Fulton County, West-Central Illinois," will have no effect on these sites which may be potentially eligible for listing on the National Register of Historic Places.

We, therefore, have no objection to the undertaking proceeding as planned. Should the project be modified from what is now proposed, please let our office know so that we may reassess any impacts to historic properties.

When the final report is sent to our office it should contain the appropriate State site file numbers throughout the text and tables. Also, the recommendations section should contain a table indicating the National Register eligibility recommentations (i.e., eligible, potentially eligible, not eligible) for all 27 archaeological sites.

A copy of this letter should be kept on file as evidence of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any questions regarding the lock please contact Ms. Tracey A. Sculle, Cultural Resources Manager, at 217/785-3977. Any questions regarding the archaeological sites and the final report should be addresed to Mr. Joseph S. Phillippe, Staff Archaeologist, at 217/785-1279.

Sincerely,

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:TAS

cc: Ron Deiss, COE-Rock Island District
Dr. Harold Hassen, IDNR
Dr. Dale Henning, Illinois State Museum

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Rock Island Field Office (ES)
4469 - 48th Avenue Court
Rock Island, Illinois 61201

COM: 309/793-5800
FAX: 309/793-5804

February 24, 1997

Colonel Charles S. Cox
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Cox:

This letter constitutes our draft Fish and Wildlife Coordination Act (FWCA) report for the Rice Lake State Fish and Wildlife Area Habitat Rehabilitation and Enhancement Project (HREP) in LaGrange Pool, Illinois River, Fulton County, Illinois. It has been prepared under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat.401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973, as amended; and in accordance with the Fish and Wildlife Service's Mitigation Policy.

The Rice Lake State Fish and Wildlife Area HREP is a component of the Upper Mississippi River System Environmental Management Program (EMP) authorized in Section 1103 of the Water Resources Development Act of 1986. The goal of the EMP is to implement "...numerous enhancement efforts...to preserve, protect and restore habitat that is deteriorating due to natural and man-induced activities."

DESCRIPTION OF THE PROJECT AREA

The study area is located adjacent to the right descending bank of the Illinois River between river miles 132.5 and 138 near the town of Banner, Illinois. Presently, the 5,592-acre area is owned in fee title and managed by the Illinois Department of Natural Resources. However, a large private land inholding, known as Duck Island, is situated in the middle of the state-owned lands. Primarily an upland agricultural area that is intensively farmed, Duck Island contains a gravel quarry pit with over 150 acres of deeper water suitable to support fish. The State is currently negotiating with the landowners to purchase the island outright. Upon acquisition of Duck Island the total acreage of the Rice Lake State Fish and Wildlife Area would exceed 6000 acres.

As an actively managed state fish and wildlife complex, Rice Lake provides a unique and diverse wildlife area with importance to resident and migrating waterfowl. Located adjacent to the Banner Marsh State Fish and Wildlife Area, the Rice Lake area compliments the deeper water habitats of Banner Marsh with several thousand acres of shallow water habitats that can be manipulated seasonally. Over eleven thousands acres of critical migratory bird habitat are under management by the State between the two sites. Fish and wildlife habitats at Banner Marsh are currently being restored under a similar HREP project initiated several years ago.

PROJECT OBJECTIVES

The goals of the Rice Lake HREP are to rehabilitate, enhance, and protect aquatic, forested and nonforested wetlands, and upland and grassland habitats for the benefit of resident and migratory birds. Both upland game and nongame species will benefit from increased habitat diversity and better management capabilities on site. These goals will be accomplished through a combination of construction features and management practices. Specifically, an increase in nesting and brood habitat as well as feeding and loafing areas for migratory birds is a priority. Creation of a deep-water refuge will provide for an improved fishery resource and reduce the incidence of avian botulism which is of great concern. Increased diversity of the area for resident upland species populations like deer, turkey, and pheasant will be enhanced through the combination of grassland and hardwood plantings described below. In addition, the integrity and reliability of the entire marsh complex will be improved by upgrading the existing dike system.

METHODOLOGY

Habitat analysis of existing study area conditions, future conditions without the project and impacts of the several proposed alternatives and increments was accomplished using the Wildlife Habitat Appraisal Guide (WHAG) procedures developed by the Missouri Department of Conservation and the USDA Natural Resources Conservation Service. This analysis employed a multi-agency team approach with representatives from the Corps of Engineers, the Illinois Department of Natural Resources, the Illinois Natural History Survey, as well as the Service.

The WHAG analysis is a numerical system for evaluating the quality and quantity of particular habitats for species selected by the WHAG team members. The qualitative component of the analysis is known as the habitat suitability index (HSI) and is rated on a 0.1 to 1.0 scale. The suitability of a given habitat type for a set of evaluation species is determined by the qualitative characteristics of the habitat type. The WHAG procedures include the use of limiting factors, habitat requirements for an individual species during a critical time of year. Absence of one or more habitat characteristics makes the habitat unsuitable and results in the lowest HSI value of 0.1. The quantitative component of the WHAG analysis is the measure of acres of habitat that are available for the selected target species. From the qualitative and quantitative

determinations, the standard unit of measure, the Habitat Unit (HU), is calculated using the formula (HSI x Acres = HU's).

Existing habitat conditions were evaluated on-site by the team, whereas future conditions with and without the project were estimated using the expertise of team members. The team considered wetland and upland habitats and both game and nongame species aspects of the project. Target species were selected to represent groups of species to be able to focus in on, and evaluate, the goals and objectives of the project. Several planning iterations were required as the project evolved and engineering data was refined.

For project planning and impact analysis, project life was established as 50 years. To facilitate comparison, target years were established at 0 (existing conditions) 1, 25 and 50 years. Habitat suitability indices (HSI) and average annual habitat units (AAHU's) for each evaluation species were calculated to reflect expected habitat conditions over the life of the project.

THREATENED AND ENDANGERED SPECIES

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action.

Therefore, we are furnishing you the following list of species which may be present in the concerned area:

Classification	Common Name	Scientific Name	Habitat
Endangered	Bald eagle	Haliaeetus leucocephalus	Winters along major rivers and reservoirs
Threatened	Decurrent false aster	Boltonia decurrens	disturbed alluvial soil

The bald eagle winters in the Illinois River valley regularly. Eagles are present in the Rice Lake area from late September or early October through April. Both diurnal perching/loafing and night roosting areas have been documented in the complex. Avoiding impacts to the night roost areas and minimal clearing of the larger perch trees used by the eagles during the day is recommended. In addition, construction activities will need to be considerate of the seasonal window from late September to late April when eagles are using the Rice Lake area.

Construction activities will need to be scheduled to avoid disturbance of the eagles, especially at the night roost sites.

The decurrent false aster has been documented within the Rice Lake project area with one location containing a population of 250-300 plants. Other sites containing lesser numbers of the plant are also documented. The species is somewhat opportunistic, responding to periodic flood events to colonize an area. It is possible that new populations will be discovered depending on future hydrologic cycles and the disturbance of soil as a result of construction activities. Known populations of decurrent false aster must be avoided during construction of the project and if new populations are discovered during construction, additional coordination with this agency is mandatory at that time.

With consideration of the above recommendations the proposed project will not negatively affect these species or their habitats and this precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. Should this project be modified or new information indicate endangered species may be affected, consultation should be initiated.

EXISTING FISH AND WILDLIFE RESOURCES

For the purpose of evaluation, the study area was categorized according to the following habitat types: wetland, upland and aquatic. These habitat types were further subdivided into the following categories: nonforested wetland, upland hardwoods, cropland, and grassland. Table (1) presents the acreage calculations of existing habitat types.

Table 1. Rice Lake HREP existing habitat types and acreage.

Wetland habitat type	Acres
Aquatic (deep water)	0
Non-forested wetland	3054

Upland habitat type	Acres
Upland hardwoods	0
Cropland	600
Grassland	0

The results of the WHAG analysis for existing conditions indicate a broad range of values for the evaluation species, reflective of the variety of habitat requirements for those species (Table 2).

Table 2. Rice Lake HREP existing habitat suitability and corresponding Habitat Unit values.

SPECIES	HSI	HU
Mallard	0.10	0.00
Canada goose	0.10	0.00
Least bittern	0.71	2117.00
Lesser yellowlegs	0.59	1797.00
Muskrat	0.29	867.00
King rail	0.10	0.00
Green-backed heron	0.69	2253.00
Fox squirrel	0.00	0.00
White-tailed deer	0.64	385.00
Turkey	0.00	0.00
Dickcissel	0.00	0.00
Bluebird	0.00	0.00
Bobwhite quail	0.11	864.00
Cottontail rabbit	0.10	0.00
Indigo bunting	0.00	0.00
Ring-necked pheasant	0.50	1635.00
Wood thrush	0.00	0.00
Kentucky warbler	0.00	0.00
Catfish	0.10	0.00
Crappie	0.10	0.00
Largemouth bass	0.10	0.00
Gizzard shad	0.10	0.00
Common carp	0.10	0.00
Bluegill	0.10	0.00
Black bullhead	0.10	0.00

The habitat values calculated using the WHAG matrix are consistent with past field data collected at the project site. The mixture of habitats within the marsh fulfill the life of many resident and nonresident wildlife species as is reflected by the wide range of habitat values of the above target species. However, an HSI value of 0.1 is calculated by the model when a critical component of a species' life requisite is absent. A corresponding "0" numerical value is then indicated in the Habitat Unit column, but this does not mean that those species represented by that particular target species are not present in the project area. Instead, it is indicative that the habitat is less than suitable for that group of species as will be discussed below.

FUTURE WITHOUT PROJECT

The No Federal Action alternative is the future without the project condition with the Rice Lake marsh complex continuing to function primarily as floodplain wetland, with minor successional changes occurring over time. The area will be actively managed with the existing pump facility, but there would be no new construction under this alternative. Another critical component of the continued success of the marsh complex, the protective dike system, will be subjected to further degradation over time, jeopardizing management of the entire complex. The without project values that have been calculated for this analysis assume that the dike system remains intact over the next 50 years. Erosional forces of the Illinois River at flood stages further degrade the protective dike system each year, increasing the potential for failure at some point in the future. The loss of the protective dike system would permanently alter the habitat types and water regime of the Rice Lake complex subjecting the area to the flooding and sedimentation of the Illinois River. Habitat values projected under this scenario would be much lower, reflecting the overall negative impacts that would result without the afforded protection of the dike. In addition, the lack of deep water for fish refuge will result in continued fish kills which have caused recurrent avian botulism outbreaks at Rice Lake.

FUTURE WITH PROJECT

Enhancement options at the project site included increasing the quality of existing habitat types, increasing the acreage of a particular habitat type(s), or a combination of both. Several alternatives were evaluated using the WHAG methodology to determine the best management of the habitat types in project area. To meet the overall goal of increasing the reliability of mid-migration habitats for migratory birds, continued active management of the area was evaluated. This included evaluating the existing degree of flood protection, the current water control and pumping facilities as well as improved pumping capacity to flood additional acreage in the fall after desired vegetation has matured. One of the primary objectives is to ensure the future value of the Rice Lake area by protecting it with a reliable dike system. Secondly, a goal of increasing the quality and acres of habitat for fish and waterfowl, dabbling ducks in particular, was identified.

Thirdly, the overall diversity of habitats in the area would be increased through acquisition of Duck Island. The island's croplands would be converted to native grasses (the prairie ecosystem is all but lost in Illinois) and plantings of hardwood mast producing trees. In addition, a deep water fish refuge would be created in the gravel pits to reduce the number of fish kills occurring in Rice Lake during low water drawdowns.

Proposed Array of Options Considered:

- Water control dike upgrade with gated outlet and rock weir overflow.

This option involves the necessary upgrade of the perimeter dike system with dredged sand from the Illinois River channel and/or selective excavation of borrow from the interior of the marsh. Two alternatives of upgrading the dike were considered: (1) top of dike at elevation 440 with the spillway at elevation 438 and (2) top of dike at elevation 442 with the spillway at elevation 440. The rock spillway structure will be constructed at the lower end of Rice Lake, on top of an existing deteriorated cross-dike known locally as the hate levee. During higher flood pulses on the Illinois River, the spillway will allow the river to flood Rice Lake gradually from the downstream end of the area, equalizing the water level on both sides of the dike before it overtops the dike. This will reduce damage to the dike and the interior marsh during major flood events. To facilitate drawdown of the Rice Lake complex two 5-foot diameter gated culverts will be installed in the dike near Goose Lake. The culverts will be gravity fed and only function when the Illinois River level is lower than the water level in the marsh.

- Improved pumping capacity and network of distribution channels.

Several alternatives were considered for improving the ability to control water levels and distribute water throughout the Rice Lake wetland habitats. The existing pump station could be abandoned and a new pump station constructed above the old Copperas Creek lock. The new station would be a larger capacity pump (100,00 gpm) complete with new distribution channels to convey water to Big Lake as well as Rice Lake. Alternatively, the new pump station could be constructed with a similar capacity to the existing pump station (approximately 50,000 gpm) to supply water to Big Lake. The existing pump station would be kept in operation to pump water into Rice Lake. This alternative would have a lower initial cost (50,000 gpm pump vs. 100,000 gpm pump), but could have higher maintenance costs associated with it since the existing pump station frequently silts in and requires maintenance dredging.

- Warm season grass plantings.

This option would convert 200 acres of existing crop fields on Duck Island to native grass prairie (see Table 3). The plantings would include a mixture of warm season grasses like big and little bluestem, indiangrass, and side oats gramma, with the option of introducing prairie

forbs into the site depending on seed availability and cost. A cool season component of grassland planting is also under consideration to provide green browse for Canada geese in the spring and summer months.

Table 3. Rice Lake HREP habitat types and acreage with warm season grass conversion.

Habitat	W/O	With
Cropland	600	400
Grassland	0	200

- Hardwood mast tree planting

This option would convert 100 acres of existing crop fields on Duck Island to a mixed hardwood planting (see Table 4). The planting would include a combination of the following tree species: pin oak, sycamore, bur oak, northern pecan, and swamp white oak.

Table 4. Rice Lake HREP habitat types and acreage with warm season grass conversion.

Habitat	W/O	With
Cropland	600	300
Grassland	0	200
Upland hardwoods	0	100

- Fish ingress/egress structure

This option involves placement of two 5-foot diameter, gated culverts between Rice Lake and the quarry pits of Duck Island. Carried in by flood events, fish become trapped in the shallow lake waters once the river recedes. Spring drawplants frequently result in fish kills. The link between the shallow manipulated waters of Rice Lake and the deeper permanent pool of the gravel pit will provide both winter and summer refugia for the fish trapped within the marsh complex. Construction of a fish passage structure would permit fish to escape to the deeper waters of the quarry during the drawndown phase as well as overwinter in the quarry pits when the rest of the shallow lake waters are frozen.

DISCUSSION

Evaluation of Alternatives

The success of the Rice Lake State Fish and Wildlife Area in providing a reliable mid-migration food source for the thousands of migratory birds that use the Illinois River flyway annually, lies in the ability to accomplish two primary objectives each year. The first is the need to drawdown the area in late spring to expose mudflats and promote a lush growth of annual plants which are protected from flooding until after the growing season. Second, is the capacity to reflood the area before arrival of the first migrants south in the fall and to be able to manipulate water levels as needed to meet specific management goals (i.e. mudflats for shorebirds vs. 2-feet of water for dabbling ducks).

Presently, the site managers have limited ability to drawn down the complex to encourage plant growth which is then subject to random flooding during the growing season and unpredictable flooding in the fall. In addition, the existing pump station is only adequate enough to flood Rice Lake proper, but inlet channel frequently silts in and must be dredged out. The Big Lake component of the complex is without a complete dike system around it and it floods when the river rises above elevation 434. Consequently, only a portion of the complex can be managed for food production with any predictability or reliability. This is reflected in the qualitative assessment of the WHAG analysis.

The wetland target species represented in the list of evaluation species presented earlier in Table 2. include: mallard, canada goose, green-backed heron, least bittern, lesser yellowlegs, muskrat, and king rail. The HSI values for these shallow water wetland species indicate that the area provides suitable habitat for a wide variety of species though the values are less than optimum for species like mallard and king rail. With a normal growing season and hydrologic cycle, the Rice Lake area attracts tens of thousands of waterfowl to the flooded moist soil plants of the marsh. However, these numbers drop significantly in years when the river remains high late into the spring and does not allow draw down of the marsh until well into the growing season, delaying or preventing the germination of the annual plants that the birds rely so heavily on. On the other hand, early fall floods may drown out the year's growth prior to arrival of the birds or flood plants too deep for dabbling ducks to utilize. Consequently, rehabilitation of the existing dike is critical to improving the overall management of the marsh. Predictability of annual success increases from the present 20% (2 out of 10 years) to 70% (7 out of 10 years) with a dike elevation at 442 and spillway elevation at 440. This represents a significant improvement in management opportunity without completely severing the backwater complex from the river's natural flood cycle. Periodic flood events are necessary to suppress woody invasion and set back annual weeds that compete with the moist soil plants. Elevation 442 represents this optimum elevation and is the preferred alternative.

As discussed above, the capacity to pump and draw down water is critical to successful waterfowl management during migration. While the managers at Rice Lake have an operational pump station at present, it is undersized to meet the demands of Big Lake and Goose Lake after the perimeter dike is rehabilitated. In addition, sedimentation has been a recurrent problem at the present pump station location resulting in higher maintenance costs. Construction of a new pump station with increased capacity located near the old Copperas Creek lock would serve as a reliable water source to the entire marsh complex. However, a new network of distribution channels would need to be constructed to convey water to both Rice and Big/Goose Lakes independently. While increased pumping capacity is preferred, the incremental analysis process will determine which alternative is the most cost effective.

Intensive management for waterfowl is usually contrary to fisheries management practices due to the shallow water levels needed for moist soil management. However, these low water levels and exposed mud flats can also have negative effects on waterfowl populations when fish kills occur. Fish trapped in the shallow lakes following flood events are subjected to the low water levels of the spring drawndown which results in lower dissolved oxygen levels and higher water temperatures and a subsequent fish kill. Decomposing fish serve as a host for maggots producing the toxin that causes avian botulism. If waterfowl ingest the maggots they succumb to the toxin and die and the cycle is perpetuated. This cycle creates a serious concern among the managers at Rice Lake, especially when waterfowl numbers are high and concentrated at the marsh. To reduce the potential for fish kills and improve the overall fisheries resource at Rice Lake, it is proposed to connect the Rice Lake marsh with the Duck Island gravel pits with two large diameter culverts that will allow fish to move between the two locations. Both winter and summer conditions will be improved for fish which should decrease the incidence of both fish kills and outbreaks of avian botulism.

Additional habitat improvements at Rice Lake will be accomplished by direct land use changes to increase the diversity of habitat types in the area. Converting a portion of the intensively farmed cropland on Duck Island to grassland and upland hardwoods is proposed. Three hundred of the 600 acres of cropland will be converted to a mixture of grassland (200 acres) and upland hardwoods (100 acres). Species diversity, both game and nongame, will be increased dramatically by creating this triad of upland habitats. In addition, the upland grasslands will provide critical nesting habitat for resident waterfowl that remain in the area. Portions of the grassland or cropland can be rotated with a cool season mixture to provide green browse for resident goose populations.

CONCLUSIONS AND RECOMMENDATIONS

The Rice Lake HREP offers a multi-faceted opportunity to protect and enhance a floodplain wetland community, improve a limited fishery resource, and restore upland grassland and hardwood communities under the umbrella of one HREP project. In addition, the proposed HREP will contribute directly to achieving the goals of the North American Waterfowl

Management Plan (an international, inter-agency plan to increase waterfowl populations),and the goals of the Partners for Flight program to protect and increase the habitats for neotropical migrants.

First and foremost, the successful management of the Rice Lake area for migratory birds is dependent on the production of a reliable food source seasonally. With the current level of dike and water level control capabilities, this success is greatly limited (about 1 in 5 years). Improvements to the dike system and water control capabilities will increase the reliability of annual food production to about 7 out of 10 years.

A decline in the incidence of avian botulism and an improved fishery resource will result by creating a deep water refuge for fish in the Duck Island gravel pits.

Furthermore, habitat improvements in the uplands consist of converting cropland to grasslands and replanting hardwood trees. A larger diversity of species will be able to utilize the Rice Lake area with the restoration of these two habitat types which are currently not found on the Rice Lake project area.

Therefore we recommend:

1. The perimeter dike improvements, spillway and gated outlets be constructed to protect the marsh and increase the reliability of food production for migrating waterfowl and shorebirds.

2. The new pump station facilities be constructed to improve water level control and increase the acreage of aquatic and nonforested wetland habitats.

3. The link between Rice Lake and Duck Island be constructed to create a fisheries refuge.

4. The habitat diversity of the complex be increased through the restoration of 200 acres of grasslands and 100 acres of upland hardwoods in an existing crop field.

We appreciate the opportunity to provide these comments and look forward to continued coordination. If you have any questions, please contact Mr. Joe Slater of my staff at (309) 793-5800 ext. 523.

Sincerely,

Wayne A. Fischer

for Richard C. Nelson
Supervisor

CEMVR-PP-M

9 March 1998
P. Kowalczyk/5210

MEMORANDUM FOR THE RECORD

SUBJECT: EMP - Rice Lake and Banner March Meeting with Illinois DNR

1. A meeting was held at the Illinois DNR's Springfield office on 3 March 1998 to discuss the Rice Lake DPR and the start of construction on Banner Marsh. Persons in attendence were as follows:

Marvin Hubbell	State of Illinois EMP Coordinator
Bob Roads	Illinois DNR – Construction Engr.
Rene Umberger	Illinois DNR – Financial
Paul A Kowalczyk	CEMVR-PP-M – Project Manager
Darron Niles	CEMVR-PD-W – Study Manager
Mike Tarpey	CEMVR-ED-N – Project Engineer
Charlene Carmack	CEMVR-PD-E – Project Biologist

2. Mr. Hubbell gave the following list of state personnel who will be working on the construction contract at Banner Marsh:

Larry Leaker – Capital Development Board (CDB) –Project Manager
Bob Roads - District Engineer
Bob Smith - Regional Engineer
Bill Douglass – Site Superintendent/Inspector
John Ball – Asst. Site Superintendent/Inspector
Norm Emerick – Wildlife Biologist
Rob Hilsabeck – Fisheries Biologist
Ann Mankowski – District Heritage Biologist

Paul Kowalczyk explained that credit towards the states share of the project costs can be given to any state employees who work on the administration of the contract. That would generally include inspectors, regional and district Engineers, as well as any engineering support (including any Engineering Firm hired to assist the state). Personnel involved in the management of the EMP program, senior managers, personnel management, and financial management are generally counted as part of the state's overhead. The state is setting up a system to track their costs on this project. The question of how to pay for the dewatering of the site by the site superintendent came up. The state would like to get credit for dewatering the site for their contractor. No decision was reached on whether this cost can be included in the credit the state get, but it will be considered if it is submitted. On the Federal contract, the contractor will be responsible for dewatering and can hire the site superintendent to do it for him if he chooses. Mr. Roads noted that they will be meeting with the contractor on 13 March 1998 and that the Corps is invited as

observers. Prior to that meeting they would like a resolution of the riprap problem (riprap specified is too big for the thickness specified).

3. The Rice Lake project shown in the Draft DPR was reviewed. The Illinois DNR concurs in the design as modified by the 18 February 1998 onsite meeting. The one modification that they would make is to include all of Duck island as part of the project. A major consideration for the project is how much credit can be given for the State's acquisition of Duck Island. It is impossible for the Corps to give an answer until the source of funding is clearly identified. If the source is another Federal Agency, then the legislation providing the funding will have to be reviewed. A name and phone number from the Federal Agency involved would be helpful in making this determination. At this time, the Illinois DNR is reviewing all of the commitments it has made for cost sharing with the Federal Government (EMP/1135/etc.). Mr. Kirby Cottrell is leading the effort and is expected to be done by mid March 1998. Mr. Hubbell will give the impact of this review on the Rice Lake project by 1 April 1998. Options being considered are, termination, a reduced project (phase I), and a full project (phase II). Ms. Carmack discussed the project benefits. She indicated that there would be benefits to aquatic, terrestial, and waterfowl. The net habitat units obtained are around 10,000. In addition to the benefits to the immediate area, this project fits in nicely with the other projects on this section of the Illinois River (Banner Marsh, Spring Lake, Lake Chautauqua, and Emiquon). This makes this one of the best projects in the EMP program. Due to limitations in federal funding, the project would not be able to be started until FY01.

Paul A Kowalczyk
Project Manager

CF: Marvin Hubbell
600 N. Grand Ave
West Suite 6
Springfield, IL 62701

Bill Douglass
Rice Lake State Fish & Wildlife Area
Illinois Department of Natural Resources
RR3 Box 91
Canton, IL 61520

DP
✓PD-W
PD-E
ED-DN
CD
CD (Eastern Area Office)
RE-A (Grizzle)
RE-A (Lazenby)

DEISS/dmd/5185

December 17, 2002

Planning, Programs, and
Project Management Division (11.2.240a)

Ms. Anne Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (IL DNR) are presently conducting a site-specific evaluation of the Rice Lake Habitat Rehabilitation and Enhancement Project area (Project) for the purposes of implementing the Upper Mississippi River System - Environmental Management Program (UMRS-EMP). The UMRS-EMP is a Federal-State partnership to restore and monitor the natural resources of the river system. The Upper Mississippi River Management Act of 1986 (Public Law 99-662) states: "To ensure the coordinated development and enhancement of the Upper Mississippi River system, it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system."

The Corps and the IL DNR propose a new pump station location (Project) as shown on portions of the August 9, 2002, Illinois Waterway digital orthographic photograph (Enclosure 1). The former location for the intake channel was within the Copperas Creek Lock. This relocation will significantly reduce intake sedimentation, and improve the pump operation and maintenance by allowing for the placement of a gated intake adjacent to the river channel. The Project area contains 1.76 acres (approximately .71 hectares) and is located in fractional parts of Sections 24 and 25, Township 6 North, Range 5 West of the 3rd Principle Meridian, Fulton County, Illinois.

Much of the project is overgrown in natural vegetation and includes portions of previously reported and recorded Site 11F2723. Historic properties (including 11F2723) within the Rice Lake UMRS-EMP are documented in the Phase I Intensive Archaeological Survey for Historic Properties Within the Upper Mississippi River System - Environmental Management Program (UMRS-EMP) for the Rice Lake State Conservation Area, Fulton County, West-Central, Illinois, dated January 1997. The Illinois State Museum, Springfield, Illinois, prepared the archeology report under Corps Indefinite Quantities Contract Number DACW25-93-D-0014, Delivery Order Number 0017. A copy of this report is in the permanent files of the Illinois Historic Preservation Agency, Springfield, Illinois. The Corps provided a copy of this report for your permanent files in 1997.

To address historic property resource concerns, the Corps and the IL DNR contracted a Phase II archeological investigation with the Illinois State Museum Society (ISMS) on portions of Site 11F2723 to determine potential affects resulting from the proposed pump station relocation for the UMRS-EMP Rice Lake project. The Phase II investigations are documented in the enclosed draft report entitled Subsurface Testing of Portions of 11F2723 for the Rice Lake Habitat Rehabilitation and Enhancement Project, prepared by Illinois State Museum, Springfield Illinois (ISMS Archaeological Survey Report No. 2002-1558-35, dated December 2002) under Corps Contract No. DACW25-98-D-0017 D.O. 23, authored by Dr. Michael D. Wiant (Enclosure 2). These investigations were completed under the Application and Permit for Conducting Archaeological Work on Department of Natural Resources Owned and Managed Lands, executed on July 26, 2002, by Dr. Harold Hassen, Cultural Resource Coordinator of the IL DNR.

The Phase II archeological investigations resulted in the entire lack of significant historic properties within the Project area. According to the draft report's conclusions and recommendations, this portion of Site 11F2723 does not meet the requirements for National Register of Historic Places eligibility, due to the lack of significant "intact" deposits (Page 4). The Corps supports the conclusions and recommendations of the draft report and requests agency concurrence that the use of the Project area for the pump station relocation will have no potential to cause effects. Agency concurrence with the draft report will meet our requirements promulgated under Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 CFR Part 800: "Protection of Historic Properties."

If no reply is received from your agency within 30 days of receipt of this correspondence, the Corps will assume that the draft report is acceptable, and two copies of the final report will be forwarded to your agency. If you have questions concerning the relocation of the pump station or the archeological investigations, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY

Dorene A. Bollman
Acting Chief, Economic and
Environmental Analysis Branch

Enclosures

Copies Furnished:

MFR: Standard coordination letter to IL SHPO forwarding the Phase II archeological survey draft report promulgated under Section 106 of the National Historic Preservation Act, for the Rice Lake EMP proposed pump station relocation.

Dr. Michael Wiant
Illinois State Museum
Research and Collections Laboratory
1920 South 10 ½ Street
Springfield, Illinois 62703 (without enclosures)

Dr. Harold Hassen
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271 (with enclosures)

Dist File (PM-M) (wo/encls)
PM-A (Deiss) (w/encls)
PM-A (Pulcher) (w/encls)
PM-A (Carmack) (w/encls)
PM-M (Niles) (wo/encls)
PM-M (Perk) (wo/encls)

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1507 • (217) 782-4836 • TTY (217) 524-7128

Fulton County Please refer to: IHPA LOG #0212200011K-F
Rice Lake Habitat Rehabilitation and Enhancement Project Area
11F2723 - Subsurface Testing of Portion of Site
Pump Station - Revised Location

February 7, 2003

Dorene Bollman
Department of the Army
Rock Island District, Corps of Engineers
Clock Tower Building - P.O. Box 2004
Rock Island, IL 61204-2004

Dear Ms. Bollman:

Re: Draft Report: Subsurface Testing of Portions of 11F2723 for the Rice Lake Habitat Rehabilitation and Enhancement Project. Illinois State Museum Quaternary Studies Program Archaeological Survey Report No. 2002-1588-35. December 2002.

Thank you for requesting comments from our office concerning the possible effects of the referenced project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

Our staff has reviewed the specifications and assessed the impact of the project as submitted by your office. It is our opinion, based on the available information, that no historic properties are affected by this project as it currently is proposed.

Please retain this letter in your files as evidence of SHPO consultation in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. This letter does not pertain to any discovery during construction, nor is it a clearance for purposes of the Human Skeletal Remains Protection Act (20 ILCS 3440; 17 IAC 4170).

Sincerely,

Anne E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:FRK

cc: Michael D. Wiant, Ph.D., ISM
Harold Hassen, Ph.D., IDNR

MFR: 2003-01-23 Meeting for Rice Lake EMP HREP **19 Feb 2003**

Meeting Attendees:

Roger Perk	COE	Tom Beissel	IDNR
Darron Niles	COE	Kevin Oller	IDNR
Rick Nickel	COE	John Marlin	IDNR/WMRC
Julie Fisher	COE	Bob Roads	IDNR
Scott Stuewe	IDNR	Bill Kapitko	IDNR/SASII
Bill Douglass	IDNR	Rob Hilsabeck	IDNR
Jim Modglin	IDNR	Barrie McVey	IDNR
Joe Ferencak	IDNR	Michelle Simone	IDNR

Rice Lake

1. Schedule
   - mid-March 2004 contract award
2. Archeological clearance has been given by the Illinois SHPO for an area 150' upstream of the Canton property line and inland to the existing road.
3. Design Features

   a. Voorhees Unit
      - Douglass would like stoplog structures, or something other than gated culverts, for ease of operation.
      - Roads would like a second berm across Slim Lake to avoid overcharging Slim Lake and the Voorhees unit.

   b. Pump Station
      - Roads wants Corps to reconsider pumping capacity with respect to initial loss due to infiltration and evaporation. He believes 150,000 gpm is necessary. **Action ED-DN.**
      - Discussion of pump station location – Roads is not convinced there will not be a sedimentation problem in front of pump station as proposed. Discussed deflection dike and off-shore island as possible alternatives to keep pump station channel free of sediment. Roads wants more assurance that DNR will be able to keep channel clean. The proposal for Copperas Lock location was discounted by Nickel as infeasible, due to minimum depths required (as well as cultural and real estate problems). Roads was agreeable/satisfied with the explanation. Nickel noted that increasing pump capacity, as requested, will also increase required pump submergence, creating a larger problem with sedimentation.
      - Nickel presented the proposed bulkhead design to keep sediment from entering pump station sump. Roads was not particularly concerned with sediment in the sump, only with sediment in the channel leading to the pump station. Roads suggested contacting pump manufacturers (such as Flygt Corp.) regarding how to keep sediment out of the sump. Roads requested that the gate slots be included in the pump station design for their future dewatering needs.
      - Roads requested that a jib crane for lifting pumps be provided in project design.

- Roads requested that the construction contract call for the pump manufacturer to provide a day of on-site training on pump operation for DNR personnel.
- Roads requested that the pump station be located as close to the channel as possible, so that they can maintain the approach with a land based backhoe (from either the top of the pump station or from the pump station's sides).

c. Water Control/Fish Passage Structures
- Nickel explained proposal for fish passage structures to quarry pit and to river.
- Nickel explained that drainage structures to river would consist of one stoplog structure and 2 or 3 gated CMP culverts (in addition to the two that exist). The need for all these structures is necessitated by the DNR's requirement to gravity drain the entire complex within 15 days.
- Structures in the water supply channel leading to Rice Lake need to be capable of passing the full load from the pump station.
- Roads wants a proposed cross-section of the feeder channel to the (river) structures so he can start the process of getting ILDNR clearance to remove trees. This is likely to be a challenge.
- Nickel explained that hydraulic dredging is required between Rice Lake and quarry structure, and also between Big Lake and Goose Lake. The DNR would like the material to go on Duck Island. Because of the large open area available there, only a small containment berm would be required. The sandy substrate would allow for infiltration rather than a return-water discharge, simplifying permitting issues. The fine dredged sediments would make the soil more suitable for planting. The Miserable Island placement site was dropped from further consideration due to tree impacts and excessive berming requirements. Placing material in an isolated portion of the existing quarry will also be evaluated as a potential alternative in the DPR.

d. Duck Island Planting
- A lengthy discussion took place between DNR personnel regarding the most beneficial end-use for Duck Island. It is the DNR's wish that the entire island eventually be planted to mast trees. The grass planting in the previous version of the DPR is no longer desired. A preferred mast tree species list will be sent to the Corps by the ILDNR.
- DNR personnel presented many scenarios for the long-term development of Duck Island, but resolution could not be reached at this meeting. Roads indicated that the DNR would discuss amongst themselves, and would present a recommendation for Duck Island to the Corps at a later date.

e. New Perimeter Berm Alignment
- DNR inquired about the alignment for raising the lower river ridge to the elevation proposed in the DPR (442.0). Roads is again concerned about getting clearance to remove trees in this area. The existing road down river ridge is no more than an 8-12 foot path through the trees. Constructing the perimeter berm will likely require clearing a path 30-50 feet wide.

- Roads will start the process of getting clearance, however, it is not expected to be easy. Revision to Recommended Plan may be required if clearance cannot be obtained.
- Two small fields were suggested as a potential placement site for channel maintenance dredged material that would be used as borrow to create the perimeter berm. **Action: PM-M will pursue clearance of this site in advance of DPR approval to allow material placement in 2003.**

4. Banner Marsh EMP Prairie Planting
   - A discussion took place regarding the Corps' recommended grass seeding rate. All DNR biologists present insisted that the rate was high.
   - Mr. Beissel, DNR, pointed out that the planting was on DNR land and questioned why the Corps wouldn't accept the DNR planting rates. Mr. Nickel reminded Mr. Beissel that this is a cooperative project between the DNR and the Corps, and that it's necessary for the Corps biologists to be in agreement with the project plan.
   - Mr. Nickel recommended a conference call between DNR and Corps biologists to resolve the issue.

5. Banner Marsh EMP Pump Station
   - Elec. Contractor will fix controller
   - Corps will pay the cost
   - Floats are freezing in well. Need a bubbler system or other fix. **Action ED-DN, PM-M**

Bill Douglass: will the Corps pay to raise the berm around pump station and water control structure #1? Roger: we will look into it. **Action PM-M, ED-DN**

DEISS/dmd/5185

March 28, 2003

Planning, Programs, and
Project Management Division (11.2.240a)

Ms. Anne Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources have been coordinating with your agency concerning the Phase I Archeological and Geomorphological investigations for the specific evaluation of the Rice Lake Habitat Rehabilitation and Enhancement Project area (Project) for the purposes of implementing the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

The Corps is providing two copies of the final report entitled: Final Report, Subsurface Testing of Portions of 11F2723 for the Rice Lake Habitat Rehabilitation and Enhancement Project, dated March 4, 2002 (Enclosure 1). Dr. Michael D. Wiant, Illinois State Museum, Springfield, Illinois, authored the report under Corps Contract No. DACW25-98-D-0017, Delivery Order 23 (ISMS Archaeological Survey Report No. 2002-1558-35). These investigations were completed on lands owned by the State of Illinois under the Application and Permit for Conducting Archaeological Work on Department of Natural Resources Owned and Managed Lands, executed on July 26, 2002.

Please keep these reports in your permanent records as evidence of our compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. No reply is necessary since your agency concurred with the draft report by letter dated February 7, 2003 (IHPA Log #021220011K-F, located in Appendix C of the final report). The Corps appreciates the timely and professional manner in which Ms. Frances R. Knight, Staff Archaeologist with your agency, contributed to the success of this project.

If you have questions concerning the final report, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY

John P. Carr
Acting Chief, Economic and
Environmental Analysis Branch

Enclosure

MFR: Standard coordination letter to IL SHPO forwarding the Phase I archeological survey final reports promulgated under Section 106 of the National Historic Preservation Act, as amended, implementing the Rice Lake HREP.

Copy Furnished:

Dr. Michael Wiant
Illinois State Museum
Research and Collections Laboratory
1920 South 10 1/2 Street
Springfield, Illinois 62703 (without enclosure)

Dr. Harold Hassen
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271 (with enclosure, 2 copies)

(w/encl):
Dist File (PM-M) (2 cys)
PM-A (Deiss)
PM-A (Pulcher)
PM-A (Carmack)
PM-M (Niles)
PM-M (Perk) (wo/encl)

WINNEBAGO TRIBE of NEBRASKA

WINNEBAGO TRIBAL COUNCIL P.O. BOX 687 WINNEBAGO, NEBRASKA 68071

December 21, 2005

District Engineer
US Army Corps of Engineers
Rock Island District
Attn: OD-P (Wayne Hannel), Clock Tower Bldg.
P.O. Box 2004
Rock Island, IL 61204-2004

RECEIVED
DEC 27 2005
CEMVR-OD-P

Re: CEMVR-OD-P-2005-1322 & 1256

Dear Mr. Wayne Hannel,

Thank you for your recent letter. The Cultural Preservation Office of the Winnebago Tribe of Nebraska would like to inform you that the Winnebago Tribe has cultural properties in the area of your proposed construction. According to the oral tradition, the Winnebago Tribe has lived in the area in the pre-historic period. The tribe had lived in the area in the early years of the historic period before the depopulation of the tribe.

You may proceed with your proposed construction, but if there are any burial sites or other cultural properties discovered in the area, please notify my office right away. Thank you.

Sincerely,

Emily DeRosa

Emily Lucy De Leon
Repatriation and Cultural Preservation Office
(402)878-3313
esmith@lptc.bia.edu

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Rock Island Field Office
4469 48th Avenue Court
Rock Island, Illinois 61201
Phone: (309) 793-5800 Fax: (309) 793-5804

IN REPLY REFER TO:
FWS/RIFO

January 4, 2006

JAN 0 6 2006

Colonel Duane P. Gapinski
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Gapinski:

This responds to Public Notice CEMVR-OD-P-2005-1256, dated December 7, 2005. The applicants, U.S. Army Corps of Engineers, and the Illinois Department of Natural Resources, are proposing to rehabilitate habitats at the Rice Lake State Fish and Wildlife Area, near Banner, Illinois, as part of the Rice Lake Habitat Rehabilitation and Enhancement Project (HREP).

Regarding federally listed species, the federally threatened bald eagle (*Haliaeetus leucocephalus*), the decurrent false aster (*Boltonia decurrens*), and the federally endangered Indiana bat (*Myotis sodalis*) are known to occur within the project limits as described. Since the actual construction phase of the project is difficult to predict, effects to each of the species cannot be assessed until that growing or breeding season.

Prior consultation with the Service, in conjunction with the Pond Lily Lake dredged material placement site, included discussion of the potential impacts to decurrent false aster plants when the material was used to rehabilitate berms as part of the aforementioned HREP. It was determined at that time that the Pond Lily Lake site could be used as a mitigation area for the additional impacts incurred during the HREP construction.

Therefore, coordination with the Service will be required prior to the start of the construction phase of the project to assess the current status of each species with respect to the proposed construction activities. In particular, a botanical plant survey will be required along the alignment of the proposed berm and borrow areas to determine the presence/absence of the decurrent false aster plants. Based on the impacts to plants incurred during construction, the mitigation plan at the Pond Lily Lake site can be modified to offset those impacts.

This letter provides comments under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); and the Endangered Species Act of 1973, as amended.

If you have any questions concerning our comments, please contact Mr. Joe Slater of my staff at (309) 793-5800 ext 208.

Sincerely,

Richard C. Nelson
Field Supervisor

cc: ILDNR (Schanzle)

S:\Office Users\Joe\2005-1256.doc

Sac and Fox Nation of Missouri in Kansas and Nebraska

305 North Main Street • Reserve, Kansas 66434
Phone (785) 742-7471 • Fax (785) 742-3785

JAN 0 9 2006

January 6, 2006

Department of the Army
Corps of Engineers
Rock Island District
ATTN: OD-P (Wayne Hannel)
Clock Tower Building - Post Office Box 2004
Rock Island Illinois 61204-2004

Dear Mr. Hannel:

Thank you for your letter, which is in compliance with Section 106 of the National Historic Preservation Act, and Section 110.

Project: CEMVR-OD-P-2005-1256

The Sac and Fox Nation of Missouri in Kansas and Nebraska NAGPRA department have determined the above project as:

No objections. However, if human skeletal remains and/or any objects falling under NAGPRA are uncovered during construction, please stop immediately and notify NAGPRA representative, Deanne Bahr, at the address above.

There are two other bands of Sac and Fox that also need to be contacted, the Sac and Fox Nation of Oklahoma and the Sac and Fox of the Mississippi in Iowa.

Johnathan Buffalo, NAGPRA Representative
Sac and Fox of the Mississippi in Iowa
349 Meskwaki Rd.
Tama, IA 52339-9629

Sandra Massey, NAGPRA Representative
Sac and Fox Nation of Oklahoma
Rt. 2, Box 246
Stroud, OK 74079

If you have any questions, please contact me at the number or address above.

Sincerely,

Deanne Bahr
Sac and Fox Nation of Missouri in Kansas and Nebraska
NAGPRA Contact Representative

Illinois Department of
Natural Resources
One Natural Resources Way • Springfield, Illinois 62702-1271
http://dnr.state.il.us

Rod R. Blagojevich, Governor
Sam Flood, Acting Director

November 1, 2006

SUBJECT: Rice Lake State Fish & Wildlife Area
Habitat Rehabilitation and Enhancement Project

Mr. Matt Zager
U.S. Army Corps or Engineers
Rock Island District
Clock Tower Building
Rock Island, Illinois 61204-2004

Dear Mr. Zager:

Thank you for the submittal of your July 18, 2005 application for an Illinois Department of Natural Resources, Office of Water Resources (IDNR-OWR) permit for the subject project. Please accept our apologies for the long delay in completing our review and providing this response. Our comments regarding the project's compliance with our Part 3700 Floodway Construction, Part 3702 Dam Safety and Part 3704 Public Water rules follow.

Part 3700 Floodway Construction Rules

- From our review of your analysis and considering the relatively low top elevations of the proposed perimeter water control levee and interior structures, we have determined that the project will not appreciably impact the river's flood carrying capacity.

- From available mapping, it appears that the perimeter water control levee will have an interior drainage area in excess of our 10 square mile jurisdictional limit. The project's impacts on that watercourse's water surface profiles will be addressed by the Part 3702 Dam Safety Rules.

Part 3702 Dam Safety Rules

- Designed, in part, to impound water and having a height in excess of 6 feet and an impounding capacity of over 50 acre feet, the perimeter water control levee will be a jurisdictional dam and is subject to the requirements of our Part 3702 Dam Safety rules. Since failure of the dam would have little potential for causing loss of life or significant property damage, the structure is provisionally classified as a Class III (low hazard potential) dam. It appears that the dam qualifies for approval under General Permit No. 98-01 (copy enclosed) which simplifies the data submission, future inspection and our review requirements. The data that would need to be submitted to show compliance under this general permit is listed on the permit.

Part 3704 Public Water Rules

- If the lakes at Rice Lake State Fish & Wildlife Area are connected by water to the Illinois River during normal river stages as it appears, they are considered public bodies of water, and our Part 3704 Public Water rules will apply. From our review of the September 1997 "Definite Project Report with Integrated Environmental Assessment", the project appears to comply with those rules. However, a detailed operation and management plan will be required to summarize and document such items as: the anticipated seasonal uses of the lakes including the period of any requested restrictive use, expected pool elevations including pumping and drawdown plans, and any public notification or advisory signage. It is suggested that you continue to work with the site manager and other appropriate IDNR personnel to develop an acceptable management plan.

- To prevent adverse effects on navigation, natural resources or other public uses of the river, we will likely require that the withdrawal of water from the river be limited or prohibited during periods of low flow.

Upon receipt of information demonstrating compliance with the dam safety rules (including plans that are sealed, signed and dated by an engineer) and a comprehensive operation and management plan documenting the proposed management of the site's public waters, processing of a permit will continue. Please feel free to contact Wes Rust of my staff or me at 217/782-3863 if you have any questions or comments concerning this matter.

Sincerely,

Michael L. Diedrichsen, P.E.
Acting Manager, Downstate Regulatory Programs

MLD:crw
Enclosure
cc: IDNR-Rice Lake State Fish & Wildlife Area (Bill Douglass)
IDNR-Office of Resource Conservation
IDNR-Office of Land Management and Education
IDNR-Office of Realty and Environmental Planning

ILLINOIS DEPARTMENT OF NATURAL RESOURCES
OFFICE OF WATER RESOURCES
~~524 SOUTH SECOND STREET~~ ONE NATURAL RESOURCES WAY
SPRINGFIELD, ILLINOIS ~~62701-1787~~
62702-1271

GENERAL PERMIT NO. 98-01

AUTHORIZING CERTAIN CLASS III DAMS

PURPOSE

The purpose of this General Permit is to authorize the construction or modification of certain Class III dams which, by complying with the terms and conditions of this permit, are determined to satisfy the Department of Natural Resources, Office of Water Resources (IDNR/OWR) "Rules for Construction and Maintenance of Dams," 17 Illinois Administrative Code 3702. A formal permit application must be submitted for review and a determination must be made by the Office of Water Resources that this general permit is applicable for the project. No work on the project shall be started until written confirmation of compliance with this permit has been provided by the Office of Water Resources.

APPLICABILITY

This General Permit is applicable to only Class III (low hazard classification) dams under the Department's jurisdiction which are in a location that they are expected to remain as Class III dams permanently. If the dam is more than 500 feet in length, the portions of the dam which are 4 feet or less in height will not be considered as a part of the embankment or be required to meet the General Conditions of the General Permit. Applications will also be reviewed for compliance with the rules regarding the "Construction in Floodways of Rivers, Lakes and Streams," "Regulation of Public Waters," and "Floodway Construction in Northeastern Illinois," 17 Illinois Administrative Code 3700, 3704, and 3708 respectively.

In order to be considered for authorization under this General Permit, an application submittal for a proposed project must demonstrate compliance with the following criteria:

1. The height of the dam, measured from the invert of the stream at the downstream dam slope toe to the top of the embankment, will not exceed 15 feet;

2. The dam will have freeboard of:

   a) at least 1.5 ft. above the 100-year frequency flood pool as determined by routing the flows through the spillway system, or

b) at least 1.5 feet plus the quantity of 0.5 feet multiplied by the drainage area to the dam divided by the reservoir surface area, or

c) 1.5 feet above the pool elevation generated by the stage on the spillway for the 100-year frequency flood peak discharge from the drainage area;

3. The dam will have an embankment top width of at least 10 feet; and

4. The dam will have side slopes no steeper than 2 horizontal to 1 vertical.

DATA REQUIRED TO BE INCLUDED WITH A SUBMITTAL

An application for a new dam or a modification to an existing dam must include the following items:

1. A completed application for permit form;

2. For existing dams, an inspection report reflecting the current condition of the dam;

3. Maps showing the location of the dam and surrounding area, the location of State, county and township roads, access to the site, the downstream area for a distance of at least 0.5 mile, the outline of the reservoir at the highest normal operating pool elevation, the watershed limits, and the general topography of the dam site and reservoir area (contoured aerial photographs or recent U.S. Geological Survey topographic maps may be used for this purpose);

4. Construction plans and documents that are sealed, signed, and dated by an engineer (or other qualified personnel) which include cross sections, plans and profiles of the dam, proposed normal pool levels, types of spillways, and which address all deficiencies noted in the inspection of the dam;

5. Documentation that the reservoir storage and spillway system, outlet works, or readily available pumping system for the dam are capable of holding and/or passing the 100-year frequency flood with the required freeboard;

6. Documentation that the spillway system, outlet works, or readily available pumping system for the dam are able to dewater 50% of the normal pool storage;

7. Documentation that the embankment and foundation will contain soils with sufficiently low permeability so as to minimize seepage (county soil surveys and maps indicating the location of the dam and borrow areas may be adequate);

8. A maintenance plan which will be applicable to the structure(s) that includes an annual review of the downstream areas for changes in land use and an indication of the pool elevations;

9. A statement by the owner indicating agreement to modify the structure in accordance with the "Rules for Construction and Maintenance of Dams" if the hazard classification of the dam changes;

10. Documentation of the ownership of, or the right to flood, the property below the elevation of the 100-year frequency flood pool elevation or the pool elevation used to assess the freeboard criteria;

11. For existing dams, a statement by the owner indicating agreement to remove all trees from the embankment as the opportunity to do so occurs;

12. A statement by the owner indicating agreement to prohibit the growth of new trees, and to appropriately vegetate the embankment to protect it from erosion; and

13. A statement by the owner granting the State the right of access to inspect the dam site and immediate vicinity before, during and after construction and for the life of the dam and appurtenances.

GENERAL CONDITIONS OF THE GENERAL PERMIT

1. This permit is granted in accordance with Rivers, Lakes and Streams Act, 615 ILCS 5 (1996 State Bar Edition) and does not preclude review of the project under other rules of the Department of Natural Resources, Office of Water Resources. This permit is not effective for any specific project until written confirmation of compliance for the project from IDNR/OWR is received.

2. The owner, and assigns, agree(s) to modify the dam in accordance with the "Rules for Construction and Maintenance of Dams" if the hazard classification of the dam changes.

3. This permit does not convey title to any permittee or recognize title of any permittee to any submerged or other lands, and furthermore, does not convey, lease or provide any right or rights of occupancy or use of the public or private property on which the project or any part thereof will be located, or otherwise grant to any permittee any right or interest in or to the property, whether the property is owned or possessed by the State of Illinois or by any private or public party or parties.

4. This permit does not release any permittee from liability for damage to persons or property resulting from the work covered by this permit, and does not authorize any injury to private property or invasion of private rights.

5. This permit does not relieve any permittee of the responsibility to obtain other federal, state or local authorizations required for the construction of the permitted activity; and if the permittee is required by law to obtain approval from any federal, state or local agency to do the work, the authorization is not effective until the required approvals are obtained.

6. In issuing this permit, the Department of Natural Resources does not approve the adequacy of the design or structural strength of any structure or improvement authorized by this permit.

7. This General Permit shall remain in effect until such time as it is modified, suspended, or revoked by the Department of Natural Resources.

This General Permit was issued on October 2, 1998.

APPROVED:

Brent Manning, Director (ORV)
Department of Natural Resources

EXAMINED AND RECOMMENDED:

10/2/98

Martin J. Stralow, Manager
Division of Water Resource Management

APPROVAL RECOMMENDED:

Donald R. Vonnahme, Director
Office of Water Resources

-----Original Message-----
From: Simone, Michelle [mailto:Michelle.Simone@Illinois.gov]
Sent: Thursday, October 29, 2009 10:15 AM
To: Carmack, Charlene MVR
Cc: Kath, Joe; Tecic, Diane; Hubbell, Marvin E MVR; Douglass, Bill
Subject: Rice Lake EMP E&T species concerns

Charlene,
The following comments address my concerns about endangered species impacts from the Rice Lake EMP project. The 450 acres of tree planting on Duck Island will mitigate the trees to be removed. However, because of known and potential occurrences of endangered species at Rice Lake SFWA, tree removal should be minimized and the project timing should be considered.

Indiana Bats – Some of the trees that will be removed in this project are potential female summer roost trees for Indiana bats. For this reason, removal of trees over 9 inches dbh should be minimized as much as possible. However, I understand that tree removal will be necessary, particularly along the river levee. To avoid direct impact to Indiana bats, no trees over 9 inches dbh should be cut between April 1 and September 30.

Bald Eagle Nests - Previously there was an active eagle nest approximately 250 yards from an area where trees are to be removed along Slim Lake (see map). That nest fell down two years ago and was not rebuilt in 2008 or 2009 so is not currently a concern. However, if an eagle nest is built within 1/4 mile of any of the construction areas, DNR Natural Heritage staff should be contacted for distance and timing recommendations. There are other active bald eagle nests at Rice Lake SFWA but they are not near any of the proposed construction areas.

Bald Eagle Winter Night Roost
An active bald eagle winter night roost occurs at Rice Lake SFWA. The new drainage channel to be constructed at the north end of the site will be near and within the eagle roost area. This will include the removal of approximately twenty silver maple trees within the eagle roost. I believe that this tree removal will not cause disturbance to the eagle roost if the construction is conducted outside the time period when the eagles will be using the roost. Therefore, no tree removal or construction activities should occur in the eagle roost area (see map) between November 15 and March 1.

Boltonia decurrens
While Boltonia decurrens occurs at Rice Lake, it is not currently known from any of the proposed construction areas so this project is not expected to impact this species.

Osprey
Ospreys are nesting at adjacent Banner Marsh SFWA and in 2007 there was a report of an unsuccessful osprey nesting attempt at Rice Lake SFWA within the northern EMP project area. There are no current osprey nests known in the project areas. However, if an osprey nest is built within 1/4 mile of any of the construction areas, DNR Natural Heritage staff should be contacted for distance and timing recommendations.

E&T species occurrences for this site should not be released in public documents. Please let me know if you need further information.

Thank you,
Michelle Simone
IDNR Natural Heritage
309-446-9181

Eagle Nature Foundation, Ltd.

300 East Hickory Street, Apple River, IL 61001

Phone: 815-594-2306 Fax: 815-594-2305 Web Site: eaglenature.com

e-mail: eaglenature.tni@juno.com Tax Exempt No. 36-4015400

Feb. 22, 2010

Marvin E. Hubbell,
Regional Manager, UMRR
Environmental Mgmt. Program
Clock Tower Building
P. O. Box 2004
Rock Island, IL 61204

Dear Mr. Hubbell,

I have looked through the disk that you sent me on the Rice Lake Rehabiliation and Enhancement Project, but could not determine to whom to send my comments, so I am writing to you, hoping that you will pass these comments on to whomever they should be sent.

You stated at the hearing that this project has been on the drawing boards for close to 20 years. I truly find that hard to believe. During those 20 years there should have been enough intelligent people working on the project, that it should be well thought out. Nothing could be further from the truth. The errors and omissions within this project are so many that a whole book could be written about them. I don't have time to write a book, so I will just enumerate a few of them in this letter.

Because these errors and omissions are so many and so great and it seems that they may have come from faulty information being given to you by IDNR personnel and possibly F&W personnel, I urge you to 1: put a halt to the project right now, before others are forced to take the Corps to court to stop it, and 2: call for a public hearing where the public can present evidence under oath and we can ask questions of your personnel, under oath, to try to get the real facts presented, that you need to use before you proceed with this project. I feel you will be just wasting your time to try to proceed with the project as it is presented on the disk.

None of your people at the Banner Hearing knew that the area would be a strip mine now, if we had not had it declared unsuitable for strip mining almost 25 years ago. It was declared unsuitable for strip mining because of the bald eagle using the area. No one seemed to know anything about any other endangered species being there, which have to be considered in your project or it can be stopped dead in its tracks.

There has been no environmental impact statement prepared to find out what other species would be affected. The bald eagle would definitely be affected by such a project. The bald eagle has definitely been affected by the mismanagement that has occurred at this site for the past 20 years. This new project would only aggravate a situation that has been deteriorating and would help make a bad situation, even worse.

Our wintering bald eagle population in the mid-west appears now to be back to where it had been in the mid 1960's. Even your own weekly Corps counts support this statement. We cannot allow its habitat to be destroyed any more than it has been already. You are relying on a statement from DNR personnel who do not know bald eagles, and know very little about how to manage them, who say that your destruction of bald eagle habitat will be mitigated by the planting of mast trees out in the cultivated fields. Nothing could be further from the truth. At the rate the present bald eagle **Page**

population is decreasing, there may be no birds left to use these trees when they ever do get large enough for eagles to use, 100+ years from now. Plus they will be in the wrong location to be useful for the bald eagles. The trees the eagles need are large ones in the nighttime roost and along the river edge for daytime perching sites. These are the very trees that will be adversely affected by this project.

The IDNR, almost 30 years ago, mitigated the destruction of a bald eagle roost in Pike County by setting some other land aside for the eagles further south. They just never told the birds and ever since there have been very few eagles using that area for wintering. This is a prime example of how successful their recommended mitigation measures have been in helping the bald eagle.

None of your personnel at Banner seemed to know anything about the Slim Lake Natural Area. It is currently site # 1121 and is a category II natural area. As such it has to be considered by the Corps and the IDNR personnel. Just because none of them either knew about it, or care about it, does not allow this project to proceed as explained on the disk.

The following are prohibited by 17 Ill. Code 4010.260:

No living or dead plant or animal materials, or organic material including soils, minerals, or water, may be removed from a registered area except as may be provided in the management program or an approved wildlife management plan or forest management plan or for the purposes of scientific research approved by the landowner, consistent with the management program and in consultation with Commission staff.

Cutting of native trees greater than 4 inches in diameter breast height is not allowed on registered areas, except for the purposes of managing or restoring natural communities or populations of threatened or endangered species, or as approved in the management program, or as part of a forest management plan or a wildlife management plan established in accordance with Section 4010.220(b), provided the plan will not jeopardize threatened or endangered species.

Section 4010.270 provides:

Management and uses not otherwise allowed by this Part may be specifically approved by the Department and the Commission where the management or use is consistent with the management program or for the purposes of restoring a high quality natural community (a plant and animal assemblage that existed in Illinois at the time of settlement by immigrants from Europe), enhancing populations of threatened or endangered species, or enhancing the opportunity for scientific research.

Before any agency or entity of State or local government may undertake an action that will disrupt natural vegetation or natural communities on a registered area, there must be a finding by the Commission at a meeting and by the Department that the action is in the public interest.

Because the Department is a partner in this Corps project, the Department must obtain permission from the Commission before Slim Lake is disturbed through land excavation and tree cutting.

I have been told that the mismanagement of the Rice Lake complex during the last 20 years has been caused by a lack of IDNR money to pump water back into Rice Lake for hunting seasons, so for many years the water level has been left too high for too long, killing some of the large trees and most of the under story trees and shrubs which were used by many other wildlife and some other endangered species. This project would raise the water level even higher and for a longer duration of time, which would just aggravate the situation even more.

Once this project has been constructed where is IDNR going to find the money to run even more pumps, if they don't have the money for their present pumps? They don't have any money for

the construction of this project other than with land use credits. How then will they have money to operate the pumps after construction? To be realistic this project should be designed so IDNR does not have to expend any money for its operation after construction.

This project would raise the water level even higher and without money to pump it out it will kill even more trees, brush and wildlife habitat. Until the State of Illinois gets its house in order, we should take those steps that will incur the least cost. My recommendation is to remove the present dams and levees and let the lake levels raise and lower as the river does. The Good Lord has been managing this river for eons and He has been doing a far better job than the Corps has ever dreamt of doing. Under His management the trees survived, the wildlife survived and many of our present endangered species were very plentiful and not endangered.

At the Banner hearing I tried to find out from your Engineer how many gallons of water would be in this complex when the water level was at the 440' height. She did not know. Then I asked how many at 439 and 438 and 437 and all the way down to the lowest level. She could not tell me. Without knowing how many gallons have to be removed from the lake when the water gets to these levels, how does the Corps, or anyone, know whether or not its discharge facilities are properly designed? The goal after a flood should be to get the water level back to the normal lake level as quickly as possible.

You theoretically have all the plans in place according to your disk. Yet your pumping station is going to be placed on the Illinois River up stream from the well that the city of Canton has placed just down stream from the historic old locks on the bank of the Illinois River. The water tube to the city of Banner which goes along the Banner Dike Road is not mentioned in your plans. How will you work around it with your 42" tubes going under the Banner road? Their pipes are already in place. This 'small detail' has to be considered in your plans before you start to dig!

There are many other issues that have not been discussed in this letter, of which other persons have more knowledge than I. The only true way to get to the bottom of all of the issues is to have a formal hearing where the public can present facts and can ask and 'hopefully' get an answer, or at least find out that your people do not know the answers. Only then will the Corps have a true baseline from which to work.

This project will adversely affect more endangered species than is presented on the disk.

On a related topic, what is the Corps stand on the proposed Banner Strip Mine issue? I see that you turned your back on the North Canton Mine issue. That pollution will be coming right down Copperas Creek to these pumps and will be pumped right into the Rice Lake complex. DNR would like us to believe that neither of these strip mines will be producing any pollution above the NPDES limits, and yet the Industry Mine has been violating those limits day after day and year after year. Either of the above mines would make Rice Lake as a settling pond for their chemical pollution. The Corps can stop both of them from creating this pollution and destroying the wildlife in the Rice Lake Complex. With your cooperation we can keep the natural environment free from these chemicals.

If we are going to save the bald eagle and other endangered species we have got to work together!

Sincerely yours,
for a Better Environment

Terrence N. Ingram, President

SIERRA CLUB
FOUNDED 1892

Heart of Illinois Group P.O. Box 3593, Peoria, IL 61614

Joyce Blumenshine
2419 E. Reservoir
Peoria, IL 61614-8029
February 25, 2010

U.S. Army Corps of Engineers
Rock Island District
ATTN: Darren Niles, Technical Coordinator
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

Comments Regarding: Rice Lake Project, LaGrange Pool, Illinois River, Illinois Waterway

To the U.S. Army Corps of Engineers:

On behalf of the over 800 members of Heart of Illinois Group Sierra Club, and its many members who value the Rice Lake State Fish and Wildlife Area for hiking, birding, fishing, camping and other recreational activities, and whose recreational use and enjoyment of this publicly owned state parkland will be adversely affected by the years of major construction work proposed by the U.S. Army Corps at this park, we question the cost verses public benefits of this over $11 million expenditure, and protest the aspects of this project that will impact the Slim Lake Illinois Natural Area site. We contend that no ditching, tree removal, or other construction activities of any kind should be allowed to impact the Slim Lake Natural Area site.

This project is primarily focused on improving human physical management of the Rice Lake State Fish and Wildlife Area for the benefit of migrating waterfowl and for hunting such waterfowl, and appears to be hugely detrimental to the other important natural aspects of Rice Lake State Fish and Wildlife Area due to impacts on the Slim Lake Natural Area and existing mature timber.

Numerous questions remain regarding major parts of this plan. We list the following significant concerns:

1. How will the 442 foot levee with a 440 foot spillway succeed in the stated purpose for this project, when late summer and early fall floods along the Illinois River at this location have been at levels that would appear to regularly top these structures? For example, the USGS listing for part of September, 2008, shows Copperas Creek levels above 21 feet, and August for the same year also showed high water levels well above 12.5 feet. What assessment has been made regarding how many years the levee will serve the stated purpose of allowing moist soil plants to grow, verses flood years when this levee will be useless for the stated purpose? How is the public getting a reasonable benefit from the expenditure of millions of dollars if the efficacy of these new structures is only in hit or miss years?

2. The fish egress channel at the south end of Rice Lake is in the end of the lake which dries out first. When lake water draws down, fish will likely move to the north end of the lake and this egress channel will not be likely to actually serve the intended purpose. It would seem that this fact would have come to the attention of the Army Corps at some time earlier in the planning process for this project. Local individuals raised this issue at the "open house" held January 27th, 2010, in Banner.

3. Has the Army Corps any proof that the state of Illinois will provide adequate annual funding to the Rice Lake State Fish and Wildlife Area to maintain and utilize are the public expenditures planned by the Army Corps? What will the full operational costs of Rice Lake State Fish and Wildlife Area be with the addition of this project ? Does the Army Corps have any responsibility to the public to ensure the Corps expenditures at this site will be effectively used and maintained, considering the financial condition of the state of Illinois and previous cuts to the IDNR budget? The state of Illinois is in financial arrears. Previous state funding for the Rice Lake State Fish and Wildlife Area has been reputed to be so problematic that the site manager has not had funds to run the existing pumps for utilization of the water management currently available at the site. Boards in the spill-over dam to Rice Lake have been left in place, leaving high water for extended lengths of time that are detrimental to existing mature trees. This was reputed to have been done because of lack of funding to pump water back into Rice Lake at a later time. The millions of dollars for this Army Corps project could easily be wasted, if the state of Illinois fails to adequately fund annual operating costs for this park. Past history would show this is a very valid concern.

4. We question if the state of Illinois has actually contributed the required 35% of project costs in using Duck Island land value.

5. The "open house" held January 27th, 2010, in Banner, was not a true public hearing in that no transcript of public comments was taken, only limited questions were allowed to be asked when all could listen, and a very limited amount of time was allowed for questions to be asked when all present could listen. While the Army Corps has worked on this project since 1987, the public was given 30 days from this "open house" to review

the over 400 page document for this project. It was also noticed that the handout page for written comments did not have the address where the comments should be sent. For individuals from a wider distance, the event lead time of a few weeks was not a very significant length of time for public notice for this "open house."

During this "open house," the public was to wander around a room and ask questions of government staff one-on-one. At least several staff, including one IDNR representative who was from north of the area, and the Army Corps environmental issues lead, stated they were unaware of the existence of the Slim Lake Illinois Nature Preserve Area at Rice Lake. None of the maps seen at the "open house" had any indication of the Slim Lake Nature Preserve, even though it is a highly significant feature at the Rice Lake site. It was completely shocking to members of the public that there appeared to be no awareness or considerations for the Slim Lake Natural Area evidenced at this "open house."

Heart of Illinois Group Sierra Club questions how the Army Corps can present a public document for review about this project, if the existence of the Slim Lake Illinois Natural Area is not fully evaluated. We question if the necessary state consultations were made before the Draft Definite Project Report was issued. This project should not proceed, and indeed, should be put on hold, until full considerations of the impacts of this proposal on the Slim Lake Natural Area are made. These considerations must take into account the construction of the 30 foot wide ditch that appears to be in the Natural Area, and the operation of this ditch including the maintenance, cleaning, clearing, and other related activities that could impair the purposes of this Natural Area.

We request proof that the Army Corps completed all legally required consultations and approvals regarding the Slim Lake Natural Area before issuance of the public comment document, including:

17 Illinois Administrative Code 4010.260:

"...No living or dead plant or animal materials, or organic material including soils, minerals, or water, may be removed from a registered area except as may be provided in the management program or an approved wildlife management plan or forest management plan or for the purposes of scientific research approved by the landowner, consistent with the management program and in consultation with Commission staff..."

"...Cutting of native trees greater than four inches in diameter breast height is not allowed on registered areas except for the purposes of managing or restoring natural communities or populations of threatened or endangered species, or as approved in the management program; or as part of a forest management plan or a wildlife management plan established in accordance with Section 4010.220(b), provided the plan will not jeopardize threatened or endangered species....

"...Before any agency or entity of state or local government may undertake an action that will disrupt natural vegetation or natural communities on a registered area, there must be a finding by the Commission at a meeting and by the Department that the action is in the public interest. ..."

Heart of Illinois Group Sierra Club questions the extent of overall habitat and wildlife benefits of this project, weighed against the huge dollar costs and the habitat disruptions this multi-year project will cause. There should be no construction and impacts to the Slim Lake Nature Preserves Area. No amount of millions of dollars of public money will correct inadequate state funding to the site and poor site management. Trees can or could be planted on Duck Island without this Army Corps project.

Heart of Illinois Group Sierra Club opposes the Rice Lake State Fish and Wildlife Area Habitat Rehabilitation and Enhancement Project as too costly and too lacking in balanced benefits to wildlife habitat overall. This project does not have necessary considerations for the Slim Lake Illinois Natural Areas Inventory site, and it is questioned if this project can legally proceed.

Sincerely,

Joyce Blumenshine
Conservation Chair

Hubbell

MAR 2, 2010

Mr. Marvin Hubble
Project manager for the Rice Lake - Big Lake issue

After reviewing the printed description of the project as well as a study of the enclosed dics, I have the following comments and question.

1. The purpose of the project as I understand it is to enhance the growth of moist soil plants which do not exist now.

2. The 2500 ft spillway will be at 440 MSL elevation. That is equivalent to 10.50 foot of water level. A look at a "TOPO" map describes land surface elevations of 440 to 442 to as high as 452 elevation along the ridge between the Illinois River and Big Lake.
It is a problem to believe that a spillway at almost the same elevation of the present ridge elevation will have any effect on preventing what the "Corps" refer to as summer time floods.

3. The fish passage ways are a hoax, the fish will leave the area as they have for centuries if DENR management will remove the boards from the spillway to allow the water to exit.
But the management won't remove from the spillway the boards that control the water level in Rice Lake. As the Site Superintendent stated in the presence of Mr. Hubble at a meeting in Banner, January 27th, 2010,"We, the "DENR" do not have the funds to pump the water back in to Rice Lake.

4. When the Corps refer to a 48 hour flood, please explain what constitutes a 48 hour flood?

5. We had floods last year (2009) that the water entered Rice Lake from Copperas Creek by over flowing the Banner Dike Road , which has an elevation of 452.
Would a 440 spillway prevent an elevation of flood water entering Big Lake? It is foolish to believe a statement like that.

6. There has been a tremendous die off of timber in Rice Lake and Big Lake due to the problem of the DENR failure to allow the flood water from leaving the lakes. It would be a crime against the area to cut 4.½ acres of remaining Big old trees to attempt to build a levee which has no purpose.
Over and over we have tried to point out the problems with water are generated by the continued miss management of RICE LAKE that we have documented

7. When the CORPS speaks of . "With the project" or "without the project" Pray tell why this monumental decision has lain dormant for 23 years beginning in 1987 only Three (3) years after Rice Lake was declared unsuitable for Surface Coal Mining?

8. Mistaken statements-- For instance, in Springfield, Il conference (approximately 4-5 years) ago Debbie Bruce (deputy director of the DENR) stated "there will be no pumping station". Yet it continues to resurface. Why would you want pumps to pump out when all you would have to do is open tubes under the Banner Dike Road and take the Boards out of spillway at Narrows Dam on Rice lake. The water will leave as it has for many years.

9. At the Banner meeting on January 27th ,2010 the people explaining the project IE Army Corps and DENR did not have any knowledge of the Rice Lake Natural Area, which was Well documented at the 14 days of testimony in Springfield, Il relative to the mine issue. Also the construction of a new berm and water conveying ditch would occur with in the Natural Area of which they (being the Corps) haven't any idea where the NATURAL AREA is located.

10. There now exists a pumping station for the flooding of Rice Lake and Big Lake if it has been used. However the DENR doesn't allow the water to leave the area in the moist soil plants growing season, so therefore there are none found as well as no mud flats for shore birds . By the way ,why did the Corps consult with the Peoria Audubon relative to the use of the area by shore birds. The DENR should have that information. Is this one more case of mis-management?

On the disc on page 1. Project Owners Summery, I the middle of the page there is a statement (Note-Dewatering Slim Lake area to allow construction of discharge channel embankment and to install a Water Control structure in same location)
The discharge channel (to fill Rice Lake, Big Lake and Voorhees, as stated the cut sections that are approximately 12 ft below the existing ground surface and small embankment above the ground surface. Shallow sections of the drainage channel will contain embankments that are approximately four ft above the existing ground and ditches that are eight ft below existing ground.

Explain how you intend to dewater this area with the ground water level within five ft of the surface.

According to the regulations, there is a binding registration agreement between the land owner and the Department and certain management practices and land uses are required and allowed. The following are prohibited by 17 ILL. Adm. Code 4010.260:

No living or dead plant or animal materials, or organic material including soils, minerals, or water, may be removed from a registered area except as may be provided in the management program or an approved wildlife management plan or forest management plan or for the purpose of scientific research approved by the landowner, consistent with the management program and consultation with Commission staff.

Cutting of native trees greater than 4 inches in diameter breast height is not allowed on registered areas except for purposes of managing or restoring natural communities or

population of threatened or endangered species.

We respectfully request that the above regulation and restrictions be adhered to.

Mr. & Mrs. John R. Grigsby Sr.
19942 N US Hwy 24
Canton, IL. 61520-8683

-----Original Message-----
From: Jane Ward [mailto:jward199@gmail.com]
Sent: Friday, March 05, 2010 7:21 PM
To: Hubbell, Marvin E MVR
Subject: Re: Rice Lake Complex Habitat Rehabilitation & Enhancement Project - LaGrange Pool - UMRS-EMP

Hello Marvin,

I was one of the participants in this week's phone conference regarding the Rice Lake project.
My contact information is as follows:

Jane Ward
21816 E US 24 Hwy
Lewistown, IL 61542
309-453-3571
jward199@gmail.com

I have attached comments in a Word document. I have quoted portions of your document where I have comments and have inserted my comments below in bold italics. I have not had time to go through the entire document, but the portions I am submitting accurately reflect my opinions on the matter, as a citizen and resident of Fulton County.

Thank you for taking the time and effort to consider the opinions of the residents of this area.

Sincerely,

Jane G. Ward

2. ASSESSMENT OF EXISTING RESOURCES

G Endangered Species. The following is a list of Federally-endangered species known to occur in Fulton County:

Status Common Name Scientific Name

Threatened Bald eagle *Haliaeetus leucocephalus*
Threatened Decurrent false aster *Boltonia decurrens*
Endangered Indiana bat *Myotis sodalist*

The bald eagle occurs in the vicinity of Rice Lake during winter months, and in 1997 an active bald eagle nest was located within the SFWA, which produced two fledglings. A portion of the Rice Lake SFWA has been designated as a significant winter roost site, and the present management plan provides for a refuge area for the species.

Decurrent false aster prefers disturbed, open sites of the Illinois Waterway floodplain. This species is under management at the Rice Lake SFWA and is present in two portions of the project area.

The Indiana bat may roost and forage for insects along the Illinois Waterway floodplain during spring and summer months. No records of the species are known for Fulton County, but the USFWS lists the bat as potentially occurring statewide in Illinois, and suitable habitat for the species exists in the floodplain forests of the study area.

At least 10 State listed endangered or threatened species (in addition to the bald eagle) have been recorded on the complex. These species are:

osprey (*Pandion haliaetus*)
little blue heron (*Florida caerulea*)
peregrine falcon (*Falco peregrinus*)
Wilson's phalarope (*Steganopus tricolor)*
American bittern (*Botaurus lentiginosus*)
Black tern (*Chilidonias niger*)
Black rail (*Laterallus jamaicensis*)
piping plover (*Charadrius melodus*)*
Mississippi kite (*Ictinia mississippiensis*)
Black-crowned night heron (*Nycticorax nycticorax*)

*Note: the piping plover is a Federally listed species that has been reported as a rare sighting on the complex and in nearby refuge areas during migration periods, but the USFWS does not list this species for Fulton County and there is no known breeding habitat for the species in the project area.

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No plan to protect the listed species exists, and no environmental impact statement has been prepared to find out what other species would be affected. The bald eagle would definitely be affected by the tree removal. Osprey and Mississippi Kites would also be affected by tree removal.

The heritage biologist, Michelle Simone, has stated that the trees removed during the project would be mitigated by the planting of mast trees on Duck Island. While it is fine to plant the mast trees on the island, that in no way mitigates the destruction of the large trees the eagles, osprey, and kites use. The eagles roost in the very area that will be affected by the proposed project. Removing those trees destroys roosting habitat that cannot be replaced with the newly planted tree.

J. Hazardous, Toxic, and Radioactive Waste. A hazardous, toxic, and radioactive waste (HTRW) site assessment was conducted. The project is located in an area that primarily is and historically has been agricultural, quarry, and outdoor recreational land. There is little evidence that the land has been used for other purposes. There were no obvious indications of potential contamination sources or migration pathways from surrounding properties. It does not appear that there is a risk of hazardous, toxic, or radioactive waste contamination within the project area.

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Capital Resources proposed Banner coal mine poses a risk of hazardous and toxic waste contamination during flooding.

3. PROJECT OBJECTIVES

A. Problem Identification. Over the past century, increased human activity within the Illinois Waterway basin, floodplain, and channel has altered the hydrology, topography, and biotic communities originally present in the project area. These alterations have reduced native plant and animal populations, degraded the quality of remaining natural resources and plant communities, impaired ecosystem functions, and threaten the future sustainability of the river-floodplain ecosystem.

1. Wetland Habitat Problem: Decreased Reliability of Seasonal Food and Cover for Migratory Birds. Alterations of the historic water level regime within the past 70 years have limited the ability of the project area to produce and sustain the native plant community that historically dominated the region and provided habitat for the diverse native wildlife community. Recreating the natural river stage cycle through a combination of active and passive water level management measures is critical to the restoration and protection of natural floodplain and aquatic habitats. Seasonal flooding and dewatering of the lake areas and management units of the Rice Lake SFWA are essential to provide the conditions necessary to promote growth of important native annual plants, which serve as a food resource and seasonal resting area for migratory waterfowl and shorebirds.

Existing facilities at the Rice Lake SFWA provide only very limited water level control capability on Rice Lake and some of the smaller moist-soil management units. Because no facilities for water level management currently exist on Big Lake and its associated management units, water levels in these portions of the project area are entirely controlled by the stage of the Illinois Waterway. Unseasonable midsummer fluctuations in river stage that result from the landscape modifications discussed above frequently prevent or reduce growth of annual native food plants in the area.

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The major problem preventing or reducing growth of annual native food plants in the Rice Lake complex is the mismanagement of the area. The IDNR have not been letting the water out of the area as needed for seasonal growth of food plants. If the IDNR would let the water out as needed, the native food plants would be more plentiful. The reason stated by IDNR personnel is lack of funds to pump the water back into the area in the fall. That problem would not be alleviated by the construction of new levees and pumping station. The area does not need a $10,000,000 project to grow annual native food plants in the area. It needs the water to be let out of the area in the spring.

E. Project Goals, Objectives, and Potential Enhancement Features. Based on the identified problems, systemic goals of the cooperating agencies, and the overall fish and wildlife management goals of the project sponsor, the following specific goals, objectives, and potential project features have been developed for this HREP (Table 3-1). Potential project features and design alternatives are described in detail in Sections 4 and 5.

Table 3-1. Project Goals, Objectives, and Potential Enhancement Features

GOAL	OBJECTIVE	POTENTIAL REHABILITATION/ ENHANCEMENT FEATURES
Restore and Protect Wetland Habitat	Increase success rate of annual emergent/moist soil vegetation production Reduce adverse effects of river stage fluctuations on wetland habitat	Construct pump station with conveyance ditches Construct low perimeter levee around Big Lake and Goose Lake
Restore and Protect	Increase fish egress opportunities	Provide access from Rice Lake to

Aquatic Habitat	from Rice Lake during drawdown periods Maintain seasonal access between Rice Lake/Big Lake aquatic areas and Illinois Waterway Increase off-main channel aquatic habitat in Illinois Waterway	deepwater areas in quarry Provide access from Goose Lake to Illinois River Dredge Senate Island side channel
Restore and Protect Floodplain Habitat	Increase natural food and cover for resident and migratory wildlife	Establish mast tree and native grass plantings on Duck Island

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The first listed goal, Restore and Protect Wetland Habitat can be met by seasonally drawing down the water in the area and using the existing pumping station (Vorhees unit) to pump water into the area in the fall. The problem with annual emergent/moist soil vegetation in the area are caused by the IDNR's failure to draw down the water in the summer for successive years due to lack of fund to pump water back into the area in the fall. They have kept the water too high for the native plants for too many years in succession. This goal can be met by better managing the area using existing features.

4. POTENTIAL PROJECT FEATURES

A. Potential Features to Restore and Protect Wetland Habitat

1. Improved Water Level Control (Perimeter Levee). This feature would involve construction of a low-level perimeter levee around Big Lake and Goose Lake to protect this area from midsummer river stage fluctuations that currently prevent reliable implementation of the ILDNR's management plan and limit the quality and availability of habitat for migratory water birds. The levee would be aligned to take full advantage of natural ground elevations on the east side of the lake and existing remnants of the Hate Levee (shown on Plate 3) to the south to minimize ground disturbance and reduce construction costs. The top elevation of the levee would be optimized to allow control of interior water levels to meet management goals while maintaining connectivity between the project area and the Illinois Waterway. The levee design would include an armored spillway located near the upstream end of the perimeter levee just west of Senate Island with a top elevation approximately two ft lower than the overall levee elevation, to allow the interior water level of Big Lake to equalize with the river level before overtopping. To allow maximum flexibility and to keep the operation and maintenance cost of the project down, the design will include a gravity flow (gatewell) structure installed through the levee at the southwest corner of Goose Lake (see Plate 6).

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This feature is not needed. It is destructive to the habitat that exists by removing large trees that eagles, osprey, and kites use. It is a known bald eagle roosting habitat. The trees existing are already in jeopardy from the practices of not releasing the water during the growing season by the IDNR management staff to save money. Removing any trees will make the roosting area and the fishing area less attractive to the eagles who have historically roosted there. No trees should be removed from the areas indicated on the map at the beginning of this report.

2. Improved Water Management Capability (Pump Station). A new pump station is proposed as shown on Plate 6. This feature would allow reflooding of the area in the fall, providing access to important food resources and feeding areas for migrating waterfowl. Construction of interior ditches also would be required to convey the water between the pump

station and interior areas.
Three potential sources of water were initially considered in developing the pump station feature: the Duck Island quarry, Duck Creek, and the Illinois Waterway. Geotechnical investigations (borings) resulted in the determination that the quarry would not be a feasible source of water due to the degree of hydraulic connection between the lakes (see Plates 28 through 31). Diversion of water from Duck Creek was also investigated because of its potential low cost for construction and maintenance. However, the flow in the creek is largely controlled by outflows from a cooling reservoir for a nearby power plant. This source was not evaluated further because adequate water supply was uncertain and agreements with private entities were logistically impractical. Consequently, the Illinois Waterway was evaluated as the only feasible source of water in formulating and analyzing alternative designs of the pump station.
The location of the new pump station would be chosen to allow accessible water conveyance with minimal maintenance dredging problems. Several thousand ft of discharge channel are required to convey the water to and from the lakes. The discharge channel would be constructed by a combination of mechanical excavation and embankment placement. Water control structures would be constructed at the upstream end of the project along the new discharge channel. These structures would provide water to the Voorhees Unit, Big Lake, and Rice Lake. Water control structures would also be installed to maintain connectivity between Upper Slim Lake and Lower Slim Lake. Two options were considered to optimize the pump station feature.
a. The existing 50,000-gpm pump station would remain to supply Rice Lake, and a new 50,000-gpm pump station would be constructed upstream from the old Copperas Creek Lock to supply Big Lake. This alternative meets the objective of providing control over the water levels on both lakes. However, the inlet channel to the existing pump station is a 3,900 ft channel from the Illinois Waterway that requires maintenance dredging approximately once every three years. Adjacent dredged material placement has become an increasing problem. The total excavation for the discharge channel would be reduced, but the sedimentation problem in the existing channel supplying Rice Lake would not be eliminated.
b. The existing 50,000 gpm pump station would be abandoned. A new pump station would be constructed upstream from the old Copperas Creek Lock. The new pump station would have a capacity of 133,200 gpm to fill both Rice Lake and Big Lake in 14 days. This alternative meets the objective of providing control over the water levels on both lakes. The station would also be located close to the Illinois River to avoid maintenance costs associated with an inlet feeder channel.

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The pump station as planned would be adjacent to the well that the city of Canton, Illinois is constructing and may interfere with their efforts. In addition, the pump station they built to pump the water from the well to Canton, caused extreme destruction of trees along the river near the historic lock and dam. If the pump station as planned in this project is constructed, many more trees will be removed from the area. These are trees that winter roosting eagles use to hunt for food during the day. The area cannot tolerate the loss of any more trees and remain a hunting place for eagles, osprey, and kites.

5. EVALUATION OF FEASIBLE PROJECT FEATURES AND FORMULATION OF ALTERNATIVES

This section describes features that met the goals and objective of this project. Each feature was evaluated to determine its potential for environmental restoration and enhancement. Cost estimates were also derived for each of the feasible alternatives.
A. Environmental Output Evaluation. A habitat analysis was conducted to assess environmental outputs (benefits) of the proposed project. This analysis employed a multi-agency team approach with participation by resource managers and biologists representing the Corps, the USFWS, and the Illinois DNR.

Assessment of existing study-area conditions, projected future conditions without the project, and expected impacts of proposed project features and alternatives utilized procedures developed by the Missouri Department of Conservation and the Soil Conservation Service. This system, the Wildlife Habitat Appraisal Guide (WHAG), is a numerical habitat appraisal system based on USFWS Habitat Evaluation Procedures (HEP) (1980).

WHAG procedures evaluate the quality and quantity of particular habitats for animal species selected by the WHAG team members. The qualitative component of the analysis is known as the Habitat Suitability Index (HSI) and is rated on a 0.1 to 1.0 scale. The quantitative component of the WHAG analysis is the measure of acres of habitat that are available for the selected evaluation species. From the qualitative and quantitative determinations, the standard unit of measure, the Habitat Unit (HU) is calculated using the formula (HSI x Acres = HUs). Changes in HUs will occur as a habitat matures naturally or is influenced by development. These changes influence the cumulative HUs derived over the life of the project. Cumulative HUs are annualized and averaged to determine Average Annual Habitat Units (AAHUs). AAHUs are used as the output measurement to compare all the features and alternatives for the proposed project.

The WHAG analysis evaluated the effects of proposed project features on habitat availability and quality for 23 wildlife and fish species. Seven species (mallard, Canada goose, least bittern, king rail, lesser yellowlegs, green-backed heron, and muskrat) were used to assess the effects of the levee and pump station features. Seven fish species (channel catfish, crappie, largemouth bass, bluegill, gizzard shad, carp, and black bullhead) were used to evaluate the fish access structures. Nine wildlife species (white-tailed deer, wild turkey, bobwhite, eastern cottontail, fox squirrel, eastern bluebird, wood thrush, Kentucky warbler, and indigo bunting) were used to evaluate native forest and grassland restoration. A detailed description of the habitat analysis is provided in Appendix D of this report.

B. Feasible Project Features. Plate 4, *Project Enhancement Features Evaluated,* shows the locations of all feasible project features described in Section 4. Project feature alternatives were identified and evaluated by the interagency team to aid in development of a recommended plan. These alternatives are described as follows.

1. Perimeter Water Control Levee (L)

a. No Action (L0). No action would result in no additional water control efforts. No AAHU gain or loss would be realized other than what may occur naturally. If no action is taken, it is anticipated that uncontrolled water level fluctuations will continue to substantially limit the habitat value of wetlands in the project area, particularly in Big Lake.

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No action would allow this part of the area to maintain its flow with the river, a desirable conditions, which would over time return the area to a more natural state, more so if areas upstream were similarly reattached to the river to provide the normal services of flood plains. No action would cost nothing.

b. Levee at Elevation 440.0 (L1). This alternative would involve constructing the
20
perimeter water control levee with a top elevation of 440.0 and a spillway crest elevation of 438.0. Gravity drawdown of the Big Lake portion of the project area would be possible when river stage is below elevation 436; drawdown could be maintained as long as river stage remained below elevation 438.0. This alternative would provide protection to Big Lake, but would not improve conditions at Rice Lake. This option also includes the construction of a gatewell structure upstream of the two existing structures to facilitate drawdown in a 14 day period. This feature yields a net benefit of 1,529 AAHUs.

c. Levee at Elevation 442.0 (L2). This alternative would involve constructing the

perimeter water control levee with a top elevation of 442.0 and a spillway crest elevation of 440.0. Gravity drawdown of the Big Lake portion of the project area could be maintained as long as river stage remained below elevation 440.0. This alternative would provide some additional protection from river stages below elevation 440.0, and would provide a slight increase in operating flexibility for the Rice Lake portion of the project area in addition to the Big Lake portion. This option also includes the construction of a gatewell structure upstream of the two existing structures to facilitate drawdown in a 14 day period. This feature yields a net benefit of 3,503 AAHUs.

Both b and c options would be costly. In addition, both options remove essential large mast trees that eagles are currently using for roosting and for fishing along the river. This is unacceptable. No trees should be removed from the areas indicated on the map provided at the beginning of this document.

2. Pump Station and Conveyance Facilities (P)

a. No Action (P0). No action would result in no additional water level management capability. No AAHU gain or loss would be realized other than what may occur naturally. If no action would be taken, it is anticipated that uncontrolled water level fluctuations will continue to substantially limit the habitat value of wetlands in the project area, particularly in Big Lake.

b. Pumping Facility for Big Lake (P1). This alternative would involve construction of a 50,000 gpm pump station, a 4,200 ft discharge channel, and water control structures to fill Big Lake. The existing pump station would remain to supply Rice Lake. This alternative would provide the capability to manipulate water levels on Big Lake, while separately maintaining existing water level management facilities on Rice Lake. This feature yields a net benefit of 1,274 AAHUs.

c. Pumping Facility for Big Lake and Rice Lake (P2). This alternative would involve abandoning the existing Rice Lake pump station, and constructing a 133,200 gpm pump station, a 7,000 ft discharge channel, and water control structures to fill Big Lake, Rice Lake, and the Voorhees Unit. Abandonment of the existing pump station and transfer of its function to the new pumping station would optimize management and operational flexibility for the entire project area, while reducing maintenance costs from a second pump station and its 3,900 ft access channel. This feature yields a net benefit of 2,866 AAHUs.

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The pump station as planned will be adjacent to the city of Canton's pump station. The construction of the pump station and the discharge channel would disrupt Slim Lake INAI sight. It will take out numerous trees and disrupt the fragile habitat that is home to numerous species, including the endangered species listed in the report. The existing pump could be used on Rice Lake in a more nature sensitive manner than it has been over the past 20 years, by letting the water out in the summer and pumping it back in the fall. The practice that has resulted in poor growth of the desired plants has been one of pumping water in during fall migration and not releasing the water due to the cost of pumping it back into the area in the fall. A new pump is not needed, especially one located near the Canton pump where too many trees have already been removed.

Army Corps of Engineers
Rock Island Office
c/o Marvin Hubbell March 5, 2010

From: Tom L.Edwards
902 W. Moss Ave.
Peoria, IL 61606

The Army Corps' Rice Lake-Big Lake Project:
It Will Be Money Down the Drain

From Tom Edwards

The Army Corps of Engineers with the Illinois Natural Resources Dept. have drawn up plans for a $11.8 million project that, in some summer months, may enable the state to temporarily pump dry its two-mile long Rice Lake and Big Lake backwater complex along the Illinois River below Banner 24 miles downriver from Peoria

Though it is not expressly stated, the justifying purpose of this "Rice Lake habitat project" is, essentially, to simply to increase fall hunting chances of shooting ducks and geese at Rice and Big Lakes, which parallel each other along the west side of the river. It is also 95% of the purpose of this entire $11.8 million project

A major river problem is that the runoff of herbicides from farmland and other places such as golf courses and lawns has literally wiped out aquatic vegetation in the Illinois River and its connected backwater lakes. That has lessened the numbers of waterfowl that once proliferated along the river and its lakes.

The river's aquatic plant life died out in 1956, the year farm herbcides came into widespread usage, and has not come back one iota since. It survives only in backwaters that are completely separated from the river.

However, if those barren lakebottoms are drained of water, "land" vegetation sprouts up to carpet those bottoms, and if re-flooded in the fall greater numbers of waterfowl will arrive to feed on it.

To make this happen at Big Lake and Rice Lake, the Army Corps of Engineer plans are:

1 -- To build a wide levee 10 feet higher than the normal river elevation between the river and Big Lake to enable keeping the river out. Though river flood waters are as much as 20 feet high at Banner, the Corps estimates that a height of 10 feet will keep the river from flooding into the two lakes four out of every 10 years.
This levee would require extensive tree removal.

2 -- In those particular years, the two lakes would then be drained in late spring or summer and planted to dry land and "moist soil" vegetation. Then river water would be pumped back in to reflood the maturing dry land vegetation to attract waterfowl in time for the hunting season.

3 -- Pumps to refill the two lakes with river water will be installed at the upstream end of the lakes.

The two lakes have lost much of their original depth over the years due to siltation. Raising water levels via a higher levee is only a temporary alleviation -- because it increases the rate of siltation, as siltation is proportional to water depth.
Remove the silt rather than stacking it up in the riverway!
Big Lake stretches along and about one-third of a mile inland from the Illinois River. But parallel Rice Lake sits 1.5 miles inland from the river, and at a slightly higher elevation. The entire length of the two lakes is separated by Duck Island, and they are equal in width.

Fish are virtually a non-consideration in the planning, except the state hopes the water manipulation may lessen Asian carp numbers, a species that has recently hugely proliferated in Illinois.

Immediately upstream of the Rice Lake Wildlife Area is the state's 5-mile long Banner Marsh,which is dotted with spring fed lakes. About half of Banner Marsh is water -- and the DNR's refusal to replace its old low-level pump has prevented raising water levels to take better advantage of its copious grassland at key times for waterfowl.

Banner is entirely spring fed, and has probably the purest water in the state and Midwest.

Among other lakes along the river in this area are, downriver, the 5-mile length of Emiquon, the 8 miles of Lake Chautauqua, Spring Lake across the river from Big Lake, and upriver the 18 miles of Upper and Lower Peoria Lake.

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NOTE: There are far better ways to apply our money to improving our environment.

ENVIRONMENTAL MANAGEMENT PROGRAM
HABITAT REHABILITIATION AND ENHANCEMENT PROJECT
RICE LAKE OPEN HOUSE
AFTER ACTION REPORT
7 April 2010

1. Introduction. This document serves as the after-action report for the Rice Lake open house held on 27 January 2010. The project goals are to enhance wetland, aquatic, and floodplain habitat. Proposed project features include: 1) a perimeter water control levee to protect interior areas from frequent Illinois Waterway stage fluctuations during the critical growing season for moist-soil food plants; 2) an overflow spillway to protect the perimeter water control levee from erosion by equalizing water levels on either side prior to overtopping; 3) a pump station to bring water into the site and discharge channel to allow water level manipulation in the fall (timely flooding) that is crucial to improving the success rate of submergent/emergent vegetation and their eventual use by migrating birds; 4) mast tree and native grassland plantings on Duck Island to restore historic floodplain cover type, diversity, and provide food and cover for resident and migratory birds and mammals; and 5) fish egress structures to create access to deep water refuge, which increases the probability of survival for individual fish during the summer drawdown periods.

2. Open House Objective. The objective of the open house was to explain on a one-to-one basis to each open house attendee the draft report results and to answer questions and listen to comments on the proposed modifications.

3. Open House Location. The open house was held at the Banner Township Hall, 273 S McArthur, Banner, IL.

4. Medium. An announcement was mailed to 192 addressees including congressional interests, federal, state and local governmental agencies; businesses, environmental organizations, media and the general public inviting them to attend an open house. The Public Affairs Office also sent a news release to area television and radio stations and newspapers.

5. Open House Format.

a. Date/Time: The open house was held on 27 January 2010 from 5:00 pm – 7:00 pm.

b. Staff: The Rice Lake HREP is a joint effort with the following agencies: Rock Island District, Corps of Engineers and the Illinois Department of Natural Resources. The Corps/agency representatives were present to talk one-to-one with the attendees during the open house and to answer any questions. The representatives were:

Darron Niles – Corps of Engineers
Charlene Carmack – Corps of Engineers
Marvin Hubbell – Corps of Engineers
Rachel Fellman – Corps of Engineers

Marsha Dolan – Corps of Engineers
Barrie McVey – IL Dept of Natural Resources
Michael Wefer – IL Dept of Natural Resources
Bill Douglass – IL Dept of Natural Resources
Bill Kapitko - IL Dept of Natural Resources
Rick Mollahan - IL Dept of Natural Resources

c. Displays. Three stations were arranged around the room with maps of the study area and the recommended plan and a laptop with a copy of the draft report displayed in the room for the public to view and ask questions. These maps drew attention at the open house and created good discussion between the attendees and the study team.

6. Attendance. There were approximately 73 attendees. The attendees were offered a handout of the executive summary, including a study map, and were asked to complete a comment sheet. Results of the returned comments are shown in paragraph 7 below.

7. Public Comments. Public meeting attendees were asked to fill out a comment sheet. A total of 21 sheets were received at the meeting and 6 written letters with comments were received through the mail.

QUESTION	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
Gained info & understanding of project	62%	33%	0	5%
Had opportunity to comment	52%	38%	10%	0
Displays were informative	60%	40%	0	0
Talked with study team member	67%	23%	10%	0
Open house was worth my time	76%	14%	5%	5%

Summary of Comment Sheet Responses

- Would prefer the ag fields on Big Lake were planted with corn, millet & other waterfowl foods, & then flooded at time of migration. Seems this would 'feed' more waterfowl than trees. I am, however, in favor of the project.
- Think it is a well thought out enhancement to an area that has been neglected for too long. It will provide ecological & recreational benefits to the people of Illinois.
- (will mail comments)
- Feel that the proposed project would benefit the Rice Lake area & the Big Lake Area for hunting & fishing.
- Great project!

- I found out what I wanted to know.
- Would like to see project finished completely.
- Looks good.
- Hope that the plan comes off as designed and on time. Badly needed.
- Feel that Duck Island should be planted with corn more than trees. Ducks need this feed to hold the waterfowl. I can see some trees, but mostly corn. If not corn other duck feed for the ducks & geese on Duck Island-even if the state plants it.
- We as hunters would like to make sure that there's funding for repumping the lake, after they have been pumped dry for the moist soil plants. We need the water for duck hunting.
-
- Duck Island should be planted with grain and nut trees.
- Not planting Duck Island will not help ducks and geese have a place to feed. Will get a lot of ducks and geese off the corn and bean fields. Ducks and geese need a place to sit and rest and eat. You are not providing this ground.
- Keep the gravel pit open.
- Would like to be posted for the events happening as they happen.
- Agree this is very worthwhile project. Have hunted and fished Rice Lake for 30+ years. Concern is the water level of Duck Island gravel pits when Big Lake is drawn down. There's presently access between the two by way of a ditch or opening that normally has 2-3 feet of water. With yearly draining of Big Lake and refilling, will this be eroded to a point that Duck Island water levels will be an issue?
- Need a formal hearing where we can get answers to our questions from a person that knows something. This is being shoved by someone without having adequate knowledge about the area. It will have a definite adverse impact on the area.

<u>Summary of Response Letters Received Via Mail</u>

- Support the much needed improvements to Rice Lake; one of the most needed and positive projects our state could come up with for our area.
- Duck and geese populations have dwindled over the years. They need places to stop and rest as they migrate each fall and spring. Rice Lake will provide that place, and a return to former glory.
- Have enjoyed Rice Lake since the 1950's and strongly endorse the Corps proposed habitat rehabilitation and enhancement project.
- The project was planned by multi-agency input and many species will benefit.
- Encourage the project to be expedited as quickly as possible as the planning has been ongoing for many years.
- Report contains many errors and omissions that may have come from IDNR and FWS personnel. Urge you to halt the project right now, before Corps gets taken to court to stop it, and call for a public hearing for public to present evidence and real facts you need to use before proceeding with project.
- Proceeding with the project as presented would be a waste of your time.

- No EIS has been prepared to determine what species would be affected. Bald eagle would definitely be affected by this project - as it has been over the past 20 years of mismanagement of this site.
- Midwest wintering bald eagle populations are back to 1960s levels; we cannot allow their habitat to be destroyed any more.
- Statement from DNR personnel that destruction of bald eagle habitat will be mitigated by the planting of mast trees in the cultivated fields could not be further from the truth.
- A previous mitigation of a bald eagle roost was not successful.
- Slim Lake Natural Area (site #1121) is a category II natural area and must be considered by the COE and IDNR personnel. No one knew about this at Banner hearing.
- Department must obtain permission from Commission before Slim Lake is disturbed through land excavation and tree cutting (ref. 17 Ill. Code 4010.260)
- Past Rice Lake problems attributed to too high water level for too long, killing large trees and understory trees and shrubs. This project would raise water level even higher for a longer duration and aggravate the situation even more.
- How will IDNR fund additional pumping for project? Design project so IDNR doesn't have to pay for O&M after construction.
- Recommend removing present dams and levees and let lake levels raise and lower as the river does.
- If you don't know how many gallons have to be removed from the lake at various water levels, how would you know if its discharge facilities are properly designed?
- Theoretically all plans are in place. For the pumping station being placed upstream from the city of Canton well, the water tube to Banner which goes along Banner Dike Rd is not mentioned. This must be considered in plans before you start to dig.
- Many more issues not discussed. Need a public hearing so public can present facts and get answers to their questions. Then the Corps will have a true baseline from which to work.
- Project will adversely affect more endangered species than is presented.
- What is Corps stand on proposed Banner Strip Mine issue?
- Regarding North Canton Mine issue - that pollution will come down Copperas Creek and will be pumped into Rice Lake complex.
- Either of these mines would make Rice Lake a settling pond for their chemical pollution. The Corps can stop the pollution and destruction of wildlife in the Rice Lake Complex.
- Project will adversely affect the recreational activities, recreational use and enjoyment of this publicly owned state parkland.
- Question the cost verses public benefits of the over $11 million expenditure, and protest the aspects of the project that will impact the Slim Lake Illinois Natural Area site.
- No ditching, tree removal, or other construction activities of any kind should be allowed to impact the Slim Lake Natural Area site.
- Project focus of improving physical management of Rice Lake appears to be detrimental to other important natural aspects of Rice Lake due to impacts on Slim

Lake and existing mature timber.

- How will the 442' levee & 440' spillway succeed in the stated purpose for this project when late summer/early fall IL River floods at this location would appear to regularly top these structures?
- Fish egress channel at south end of Rice Lake is in the end of the lake that dries out first. When lake water draws down, fish will likely move to north end of lake and south egress channel won't serve the intended purpose.
- Is there proof that State of IL will provide adequate annual funding to maintain Rice Lake? What will adding this project do to operational costs of Rice Lake? Does Corps ensure expenditures at this site will be effectively used and maintained?
- Lack of State funding for Rice Lake has limited the use of existing pumps for utilization of the water management currently available at the site.
- Boards in spill-over dam left in place (reportedly due to lack of funds), leaving high water for extended lengths of time which is detrimental to existing mature trees.
- Project dollars could be wasted if State doesn't fund annual operating costs for this park.
- Has State of IL actually contributed the required 35% of project costs in using Duck Island land value?
- January open house not a true public hearing. COE has worked on this project since 1987, but public given 30-days to review the 400-page document for this project.
- No return address on comment sheet; public notification of meeting not far enough in advance.
- Several COE and IDNR staff at meeting stated they were unaware of the Slim Lake Illinois Nature Preserve Area at Rice Lake, and this Area was not indicated on any of the maps.
- How can COE present a public document for review if the existence of the Slim Lake Illinois Natural Area is not fully evaluated?
- Project should be put on hold until full consideration of impacts on Slim Lake is made. Must consider the construction of the 30' wide ditch that appears to be in the Natural Area, and the operation of this ditch including the maintenance, cleaning, clearing and other related activities that could impair the purposes of this Natural Area.
- Question if necessary state consultations were made before the draft DPR was issued.
- Request proof that COE completed all legally required consultations and approvals regarding Slim Lake natural Area before issuance of the public comment document. (ref: 17 Ill. Code 4010.260)
- Question the extent of overall habitat and wildlife benefits of this project, weighed against the huge dollar costs and the habitat disruptions this multi-year project will cause.
- There should be no construction and impacts to the Slim Lake Nature Preserves Area.

- Project is too costly and too lacking in balanced benefits to wildlife habitat overall.
- No plan to protect listed endangered species exists. No EIS has been prepared to determine which species would be affected. Bald eagle, Osprey & Mississippi Kites affected by tree removal.
- It's fine to plant mast trees on island, but this does not mitigate destruction of large trees that eagles, osprey and kites use.
- Eagles roost in that area and would be affected by removing trees as proposed by project.
- Capital Resources proposed Banner coal mine poses risk of hazardous and toxic waste contamination during flooding.
- Major problem preventing or reducing growth of annual native food plants in Rice Lake complex is mismanagement of the area. IDNR not letting water out of area as needed for seasonal growth of food plants. If done as needed native food plants would be more plentiful.
- IDNR states they are faced with a lack of funds to pump water back into the area in the fall. This problem would not be alleviated by construction of new levees and pumping station. Area doesn't need $10 M project to grow annual native food plants - it needs water to be let out of area in spring.
- Goal to 'Restore & Protect Wetland Habitat' can be met by seasonally drawing down water in area and using existing pumping station (Vorhees unit) to pump water into area in fall.
- Problem with annual emergent/moist soil vegetation caused by IDNRs failure to draw down water in summer for successive years due to lack of funds to pump water back into area in the fall. Water too high for native plants for too many years in succession.
- Perimeter levee is not needed. It is destructive to habitat that exists by removing large trees used by eagles, osprey and kites.
- This is a known bald eagle roosting habitat. Existing trees already in jeopardy from practice of not releasing water during growing season to save money.
- Removing trees makes roosting area and fishing area less attractive to eagles.
- Pump station, as planned, would be adjacent to well that Canton is constructing and may interfere with their efforts, and many more trees will be removed from the area.
- Pump station built by Canton to pump water from the well to the city caused extreme destruction of trees along the river near the historic lock and dam.
- Trees are used by winter roosting eagles to hunt for food during the day. Area cannot tolerate loss of any more trees and remain a hunting place for eagles, osprey and kites.
- A no action alternative would allow this part of the area to maintain its flow with the river and, over time, return the area to a more natural state. No action would cost nothing.
- Both b and c options (building levees) would be costly and both remove essential large mast trees currently used by eagles for roosting and fishing along the river. Unacceptable. No trees should be removed.
- Construction of pump station and discharge channel would disrupt Slim Lake INAI

sight, removing numerous trees and disrupting fragile habitat that is home to many species including endangered species listed in report.

- Existing pump could be used on Rice Lake in a more nature sensitive manner by letting the water out in the summer and pumping it back in the fall.
- Poor growth of desired plants has resulted from practice of pumping water in during fall migration and not releasing water back into area in the fall due to cost of pumping.
- New pump is not needed, especially one located near the Canton pump where too many trees have already been removed.
- Difficult to believe that a spillway (elevation 440) at almost the same elevation of the present ridge (452 MSL) will have any effect on preventing what the Corps refers to as summer time floods.
- Fish passage ways are a hoax. Fish will leave the area as they have for centuries. Management won't remove the boards that control the water level in Rice Lake from the spillway because of lack of funds to pump water back into Rice Lake.
- Please explain what constitutes a "48 hour flood."
- In 2009 flood water entered Rice Lake from Copperas Creek by overflowing the Banner Dike Road (elev. 452). Would a 440 spillway prevent (that) elevation of flood water entering Big Lake?
- Failure to allow flood water to leave the lakes has caused a die-off of timber in Rice & Big Lakes. Should not cut 4-1/2 acres of remaining big old trees for a levee that has no purpose.
- Have tried to point out that problems with water are generated by continued mismanagement of Rice Lake. We have documented this.
- Why has this project lain dormant for 23 years, beginning in 1987 only 3 years after Rice Lake declared unsuitable for surface coal mining?
- 4-5 years ago DENR director said "there will be no pumping station" yet it continues to resurface. Don't need a pump to pump out - just open tubes under Banner Dike Rd and take boards out of spillway at Narrows Dam on Rice Lake and water will leave.
- Staff at January meeting did not have knowledge of Rice Lake Natural Area - an area well documented following the mine issue. (How can) construction of a new berm and water conveying ditch occur within the Natural Area if you don't know where it is.
- There now exists a pumping station for flooding of Rice Lake and Big Lake, if it has been used. Water not allowed to leave the area in the moist soil plants growing season so there are none, and no mud flats for shore birds.
- Statement on the disc, pg 1, Project Owners Summary: Note-Dewatering Slim Lake area to allow construction of discharge channel embankment and to install a Water Control structure in same location. How do you intend to dewater this area with the ground water level within 5 feet of the surface?
- Request that the regulations and restrictions of 17 ILL. Adm. Code 4010.260 (regarding management practices and land uses) be adhered to.

8. Summary. The open house met the objective of providing information on the draft report for the proposed project. The discussion between the study team personnel and the public was informative. Attendees generally support the open house format for this project. This report is being distributed to the study team members for their consideration and analysis.

Marsha Dolan

MARSHA DOLAN
Public Involvement Specialist
Economic & Environmental Analysis Branch

CF:
PD-F (D. NILES)
PD-E (C. CARMACK)
PD-E (M. DOLAN)
EC-DN (R. FELLMAN)
PM-M (M. HUBBELL)
PM-M (DIST FILE)

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
http://dnr.state.il.us

Pat Quinn, Governor
Marc Miller, Director

April 9, 2010

Gary R. Meden
Deputy for Programs and Project Management
US Army Engineer District, Rock Island
Clock Tower Building
P.O. Box 2004
Rock Island IL, 61204-2004

Dear Mr. Meden:

The Illinois Department of Natural Resources (Department) supports the U.S. Army Corps of Engineers' (USACE) Rice Lake Habitat Rehabilitation and Enhancement Project for ecosystem restoration Rice Lake State Fish and Wildlife Area, Fulton County, Illinois. The project's primary purpose would be to improve habitat for migratory waterfowl. Reestablishing the Hate Levee and installing the pumping facility would reduce sedimentation and enable manipulation of the water level necessary for moist soil management. Food supply for waterfowl would be more reliable due to greater water control capabilities. Habitat would be improved for herons, egrets, shorebirds, eagles, cormorants, and other species that utilize the area.

Construction for the Rice Lake HREP is estimated at $18,533,312. Federal share at 65% is $11,744,268. The total non-Federal cost share at 35% is estimated at $6,789,044 utilizing land credits towards its 35 % cost-share. Current LERRD estimates exceed the 35% cost share. The state will receive LERRD credits not to exceed 35% of project costs.

Project operation and maintenance, at an estimated average annual cost of $34,117 would be the Department's costs at 100% as the non-Federal Sponsor.

We will provide all necessary assistance to the US Army Corps in obtaining all permits and certifications, including a Section 401 Water Quality Certification and the Illinois joint permit to work in the floodplain, that are required for this project to proceed to construction in a timely manner. Thank you for your assistance in this effort. If additional information is needed, please contact Mr. Richard J. Mollahan at 217-785-8264.

Sincerely,

Marc Miller
Director

cc: Richard J. Mollahan

bcc: Jim Herkert, ORC
Debbie Bruce, ORC
Todd Rettig, OREP
Gary Clark, OWR
Bill Douglass, Lands
Art Neil, Contracts and Engineering

Illinois Department of Natural Resources

COMPREHENSIVE ENVIRONMENTAL REVIEW PROCESS

Project Code: 1007815 **Project Title:** Rice Lake EMP

Site Name: Rice Lake SFEWA **Proposed Start Date:** 8/1/10

Contact Person: Bill Douglass **Phone Number:** 309-647-9184

Email Address: _____ @ _____ **Fax Number:** 309-647-1013

County: Fulton **T:** 6N/5N **R:** 6E/5E **S:** 23, 26, 34, 33

Project Description: To provide water control AND pumping 3, 4 For Rice Lake & Big Lake

Funding Sources: **IDNR Capital** _____/ **Heavy Equipment** _____/ **Force Account** _____

Other State, Local, or Private Agency _____

Federal _____ **Federal program** (e.g., P-R) EMP

Approval by Site Superintendent: (for all NON CAPITAL projects, e.g., heavy equipment, force account, leases, R.O.W., etc.):

W P Douglass 3-22-10

Signature, Site Superintendent **Date**

CERP Staff Only:

REVIEWS PERFORMED

	Approved	Approved with Restrictions	Comments
Threatened & Endangered Species			
Natural Areas/Nature Preserves	X		All concerns have been
Wetlands	X		addressed and accommodated
Cultural Resources	X		for in the USCOE-RI
Other	X		final report.

Rich Lewis 4-16-10

Rich Lewis, Manager **Date**
CERP - 217-785-5500

DEPARTMENT OF NATURAL RESOURCES
MAR 24 2010
OREP

Rice Lake State Fish & Wildlife Area: Habitat Rehabilitation and Enhancement Project – CERP #1007815

The project is approved with the following stipulations:

Indiana Bats – Some of the trees that will be removed in this project are potential female summer roost trees for Indiana bats. For this reason, removal of trees over 9 inches dbh should be minimized as much as possible. However, it is understood that tree removal will be necessary, particularly along the river levee. To avoid direct impact to Indiana bats, no trees over 9 inches dbh should be cut between April 1 and September 30.

Bald Eagle Nests – Previously there was an active eagle nest approximately 250 yards from an area where trees are to be removed along Slim Lake. The nest has not been rebuilt for the last two years. However, if an eagle nest is built within ¼ mile of any of the construction areas, IDNR Natural Heritage staff should be contacted for distance and timing recommendations.

Bald Eagle Winter Night Roost – An active night roost occurs at Rice Lake SFWA. The new drainage channel to be constructed at the north end of the site will be near and within the eagle roost area. This will include the removal of approximately twenty silver maple trees within the eagle roost. It is believed that this tree removal will not cause disturbance to the eagle roost if the construction is conducted outside the time period when the eagles will be using the roost. Therefore, no tree removal or construction activities should occur in the eagle roost area between November 15 and March 1.

Boltonia decurrens - Boltonia decurrens does occur at Rice Lake SFWA. In the Natural Heritage database there is a record at the proposed pump station location. If Boltonia decurrens plants are located in the construction area, it should be addressed with IDNR Natural Heritage staff and USFWS.

Osprey – Ospreys are nesting at adjacent Banner Marsh SFWA and in 2007 there was a report of an unsuccessful osprey nesting attempt at Rice Lake SFWA within the northern EMP project area. There are no current osprey nests known in the project areas. However, if an osprey nest is built within ¼ mile of any of the construction areas, IDNR Natural Heritage staff should be contacted for distance and timing recommendations.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Rock Island Field Office
1511 47th Avenue
Moline, Illinois 61265
Phone: (309) 757-5800 Fax: (309) 757-5807

IN REPLY REFER TO:
FWS/RIFO

April 30, 2010

Kenneth A. Barr
Chief, Economic and Environmental Analysis Branch
U.S. Army Corps of Engineers
Rock Island District
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Mr. Barr:

This document provides review and comment on the Rice Lake State Fish and Wildlife Area (SFWA) habitat rehabilitation and enhancement project under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) (FWCA) and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA). Specifically, this document serves as the Fish and Wildlife Service's Final Fish and Wildlife Coordination Act Report under FWCA and Biological Opinion under the ESA.

To minimize impacts to fish and wildlife resources, we recommend that the following conservation measures identified in the attached Biological Opinion be incorporated into the project.

1) Manage the Pond Lily Lake area of Rice Lake SFWA for the benefit of *Boltonia decurrens* (*B. decurrens*). Appropriate management activities may include, but are not limited to, water level manipulation or discing to provide bare substrate for colonization, over-seeding (if needed) with *B. decurrens* to promote long term population viability and genetic diversity, and protection of the area from unnatural disturbance that may have a negative effect on the population.
2) In cooperation with the Fish and Wildlife Service, monitor pre-construction and post-construction populations of *B. decurrens* in the project action area. Post-construction monitoring and reporting should occur every two years until the species is de-listed or the U.S. Army Corps of Engineers and Fish and Wildlife Service mutually agree to terminate monitoring efforts. Reports should include estimates of pre-construction individuals/population and impacted individuals/population as a result of construction activities. Reports following project completion should document changes in existing populations as a result of project and water level management.
3) Avoid and protect documented populations of *B. decurrens* adjacent to construction areas through the installation of protective temporary fencing, as described in the 2010 Biological Assessment. In the event that plans change or the project may affect *B. decurrens* other than as anticipated in the Biological Opinion, the Service should be consulted.

Provided that these measures are incorporated into the project, we support the project as proposed.

If you have any questions please contact Amber Andress of my office at 309-757-5800 x 222.

Sincerely,

Richard C. Nelson
Field Supervisor

Enclosure:
Final Biological Opinion For Rice Lake State Fish And Wildlife Area
Habitat Rehabilitation And Enhancement Project

CC: ILDNR (Douglass)

FINAL BIOLOGICAL OPINION

FOR RICE LAKE STATE FISH AND WILDLIFE AREA HABITAT REHABILITATION AND ENHANCEMENT PROJECT

U.S. ARMY CORPS OF ENGINEERS

APRIL 2010

Prepared by:

U.S. Fish and Wildlife Service
Rock Island Field Office, Moline, Illinois

Introduction

The Biological Assessment issued by the U.S. Army Corps of Engineers (Corps) on April 30, 2010, considers effects to the federally listed species for Fulton County, Illinois, which include the eastern prairie fringed orchid (*Platanathera leucocephalus*), Indiana bat (*Myotis sodalis*), decurrent false aster (*Boltonia decurrens*), the federal candidate sheepnose mussel (*Plethobasus cyphyus*), and the federally protected bald eagle (*Haliaeetus leucocephalus*).

The Corps has determined that project area does not contain suitable habitat for the eastern prairie fringed orchid nor the sheepnose mussel. Therefore, the Corps has concluded that the project will have no effect on these species. The Fish and Wildlife Service (Service) has no objection to this determination.

The Illinois Department of Natural Resources has identified one bald eagle nest within the Rice Lake State Fish and Wildlife Area (SFWA) and bald eagles are known to use the project area during the winter months. However, the Corps has indicated that the project is not expected to directly impact trees regularly used by bald eagles, and no construction activities will occur within a distance of 0.25 miles or less of the known nest. If the project is modified or new information indicates that bald eagles may be affected, this Service should be contacted.

According to the report, the Corps has indicated that suitable habitat for the Indiana bat is present within the project area. However, because clearing will be limited to the minimum amount necessary for construction and 352 acres of bottomland hardwood trees will be planted in the project action area, the Corps had determined that the project is not likely to adversely affect the species. The Service concurs with this determination, provided that all clearing of potential habitat is conducted outside of the maternity season (occurring from April 1 to September 30 in Illinois) as proposed in the April 30 Biological Assessment. Should the project be modified, or new information indicate that the Indiana bat may be adversely affected, consultation with the Service should be initiated for this species.

Finally, because *Boltonia decurrens* (*B. decurrens*) is present onsite within the construction footprint of the project, the Corps had concluded that the project may adversely affect this species and has initiated formal consultation. This document provides the Service's Biological Opinion on the proposed action.

Consultation History

Previous consultation on this project consisted of our Tier II Biological Opinion, dated July 16, 2003, based on the Tier II Biological Assessment issued in May, 2003 and the 1999 Tier I Biological Assessment for the Operation and Maintenance of the 9-foot Navigation Channel Project. The Tier II Biological Opinion was prepared for dredged material placement resulting from dredging of Copperas Creek and Duck Island dredge cuts. It is our current understanding that this dredge placement did not occur.

In January of 2010, the Corps issued the public review draft of the Definite Project Report for the Rice Lake SFWA habitat rehabilitation and enhancement plan. On April 19, 2010 the Corps submitted a draft Biological Assessment, followed by a final biological assessment on April 30, 2010 with reference to final project plans. This Biological Opinion is submitted in response to the April 30, 2010 Biological Assessment and has been expedited to accommodate Corps planning targets.

Description of Proposed Project and Action Area

The Rice Lake SFWA habitat rehabilitation and enhancement project is located on the right descending bank of the Illinois Waterway between River Miles 132.0 and 138.0 near Banner, Illinois. It consists of

6,800 acres of wetland, bottomland forest, grassland, open water, agricultural land, wildlife food plots, and gravel quarry. Rice Lake SFWA is currently owned and managed by the Illinois Department of Natural Resources and has been designated as a habitat rehabilitation and enhancement project by the Corps.

According to the Definite Project Report issued by the Corps in January, 2010, the purpose of the project is to improve the wildlife habitat quantity and quality of Rice Lake SFWA by completing the following objectives:

- increase success rate of annual emergent/moist-soil vegetation production
- reduce adverse effects of river stage fluctuations on wetland habitat
- increase fish egress opportunities from Rice Lake during drawdown periods
- maintain seasonal access between Rice Lake/Big Lake aquatic areas and Illinois Waterway
- increase off-main channel aquatic habitat in Illinois Waterway, and
- increase natural food and cover for resident and migratory wildlife.

More specifically, the project will involve the construction of a perimeter water control levee, pump station, and discharge channel, installation of concrete fish egress structures, and planting of 409 acres of native trees, grasses, and forbs (USACE 2010).

Status of the Species

This section presents the biological and ecological information relevant to formulating this Biological Opinion. Appropriate information on the species life history, its habitat and distribution, and other data regarding factors necessary to its survival is included to provide background for analysis in later sections. This information is also presented in the listing documents, the Recovery Plan (Service 1990), the Final Biological Opinion for the Operation and Maintenance of the 9-foot Navigation Channel on the Upper Mississippi River System (USFWS 2000), the Biological Assessment of the Upper Mississippi River-Illinois Waterway System Navigation Study (USACE 2004), and the Service's Biological Opinion for the Upper Mississippi River-Illinois Waterway System Navigation Study (USFWS 2004).

B. decurrens was listed as a threatened species by the Service on November 14, 1988 (53 FR 45861). It is a floodplain species that occurs along 250 miles of the lower Illinois Waterway and parts of the Upper Mississippi River near St. Louis, Missouri (Schwegman and Nyboer, 1985, USFWS 1990). Herbarium records indicate that its historical range and habitat were the shores of lakes and streams in the Illinois River floodplain and the Mississippi River floodplain at its confluence with the Illinois River (Schwegman and Nyboer 1985).

B. decurrens is an early successional, biennial plant species that requires open areas for population establishment, and its natural habitat has been described as wet prairies, shallow marshes, and shores of open rivers, creeks, and lakes (Schwegman and Nyboer 1985). In the past, the annual flood/drought cycle of the Illinois River provided the natural disturbance required by this species. Annual spring flooding created the requisite open, bare-soil habitat and reduced competition by eliminating less-flood tolerant competitors. Field observations indicate that in areas without disturbance, the species is eliminated by competition within three to five years. While suitable habitat has been described as stated above, no critical habitat is currently designated for the species.

The Service's five year review has determined that the species population status was generally stable (USFWS 2010). The Recovery Plan states that the species will be considered recovered after 12 stable populations have been protected by purchase, easement, or cooperative management agreement (USFWS

1990). Recent surveys have identified as many as 26 populations (USFWS 2010), but numbers of individual plants have periodically decreased (Smith 2002). Given the fecundity of the species and the long-term viability of achenes (Baskin and Baskin, 2002), it is likely that numbers of individual plants within each known population will vary widely with changing hydraulic conditions. Overall, the rangewide population of the species is believed to be stable to date. However, habitat destruction and modification continue to have detrimental effects on the species.

Environmental Baseline

The purpose of the environmental baseline is to describe past and ongoing human and natural factors that have contributed to the current status of the species and its habitat in the project vicinity. Factors with the potential to adversely affect *B. decurrens* in the area include flooding on the Illinois Waterway of unnatural height and duration, drainage and land-use change of floodplain wetlands, altered flood regimes on the natural floodplain due to levee systems, and high siltation rates in conjunction with seed deposition. However, efforts by private landowners, State, and Federal agencies to conserve and protect populations have provided refugia for many populations of the species.

Effects of the Action

Approximately 15,000 linear-feet of levee system including an overflow spillway, gatewell structure, pump station, and conveyance facilities, will be constructed to protect Rice Lake SFWA from low level summer flooding and provide for active water level management (USACE 2010b). Protection from unnatural off-season flooding will facilitate the establishment of moist-soil vegetation habitat, which may also result in an increase in suitable habitat for *B. decurrens*. However, population records indicate that *B. decurrens* is present in the vicinity of the proposed levee system and pump station. Construction of the levee system and appurtenant facilities may therefore result in the loss or burial of individual specimens and the destruction of suitable habitat within the construction footprint.

The Illinois Natural Heritage Database and Service records indicate that a large population of *B. decurrens* is present directly adjacent to the proposed water control structures on the northwest side of the project area. However, the Corps Definite Project Report indicates that temporary protective fencing will be installed to protect this area from impacts due to construction (USACE 2010a). Therefore, impacts to this documented population as a result of construction activities are expected to be negligible.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

Cumulative effects that are reasonably certain to occur in the action area include a variety of water level and wetland management strategies by waterfowl clubs in the vicinity to promote moist soil plant production. These actions are not expected to change *B. decurrens* habitat suitability on private lands adjacent to the project area.

Conclusion

After reviewing the current status of *B. decurrens*, the environmental baseline for the action area, the effects of the proposed action described above, and the expected cumulative effects, it is the Service's

biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of *B. decurrens*.

Incidental Take

Sections 7(b)(4) and 7(o)(2) of the Endangered Species Act do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that the ESA requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

Conservation Recommendations

Section 7(a)(1) if the ESA directs federal agencies to utilize their authorities to further the purposes of ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement, or to develop information.

1) Manage the Pond Lily Lake area of Rice Lake SFWA for the benefit of *B. decurrens*. Appropriate management activities may include, but are not limited to water level manipulation or discing to provide bare substrate for colonization, over-seeding with *B. decurrens* seed to promote long term population viability and genetic diversity, and protection of the area from unnatural disturbance that may have a negative effect on the population.

2) In cooperation with the Service, monitor pre-construction and post-construction populations of *B. decurrens* in the project action area. Post-construction monitoring and reporting should occur every two years until the species is de-listed or the agency and Service mutually agree to terminate monitoring efforts. Reports should include estimates of pre-construction individuals/population and impacted individuals/population as a result of construction activities. Reports following project completion should document changes in existing populations as a result of project and water level management.

3) Avoid and protect documented populations of *B. decurrens* adjacent to construction areas through the installation of protective temporary fencing, as described in the 2010 Biological Assessment. In the event that plans change or may affect *B. decurrens* other than as anticipated in the Biological Opinion, the Service should be consulted.

References

Baskin, C.C. and J.M. Baskin. 2002. Achene germination ecology of the federally threatened floodplain endemic Boltonia decurrens. American Midland Naturalist 147:16-24.

Schwegman, J.E. and R.W. Nyboer. 1985. The taxonomic and population status of *Boltonia decurrens* (Torr. & Gray) Wood. Castanea 50:112-115.

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USACE. 2004. Biological assessment of the Upper Mississippi River-Illinois Waterway System Navigation Study. 193pp.

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USFWS. 1990. Decurrent False Aster. U.S. Fish and Wildlife Service. Twin Cities, MN. 26pp.

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USFWS. 2010. Decurrent false aster 5-year review: Summary and Evaluation. 20pp.

May 22, 2010

Marvin Hubbell, Project Manager
U S Army Corps of Engineers
Rock Island District
Clock Tower Building
P O Box 2004
Rock Island, IL 61204-2004

RE: Proposed Army Corps of Engineers Rice Lake State Fish and Wildlife Area Habitat Rehabilitation and Enhancement Project

Dear Mr. Hubbell,

I am very concerned that nearly $12 million in Federal funds and nearly $7 million credits from the Illinois Department of Natural Resources are going to be expended on a harmful and questionably designed proposed project by the U.S. Army Corps of Engineers at the Rice Lake State Fish and Wildlife Area, Fulton County, Illinois, along the Illinois River. The Illinois Department of Natural Resources approved this project, without what seems to be the legally required environmental reviews.

Endangered plants and animals are in areas that will be impacted by the Corps. Citizen complaints and questions are going unanswered. The money for this project should be used to save habitat and improve the river, not destroy natural areas and build more levees for at a best a 30% success rate of moist soil plants.

My parents owned land where I grew up that extended into Rice Lake. The property is still owned by my brother. I have lived across from this state conservation area for 70 years. Therefore I feel that I have first-hand knowledge of the area and experience to address the following issues.

This Rice Lake State Fish and Wildlife Area Habitat and Rehabilitation Enhancement Project is being financed with Upper Mississippi River Environmental Management Program funds. Potential and very possible problems with this project include:

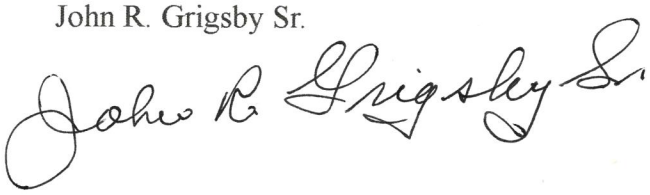
1. The levee height construction at 442 Mean Sea Level (12.5 feet) will not serve the intended purposes as outlined in the proposed project as listed
2. water levels along this part of the Illinois River regularly top 13 feet (442.50 MSL) which overtops the dam at Rice Lake
3. a 2,500 foot spillway will be constructed at an elevation of 440 MSL, and that the area where it will be constructed is presently at a 442 MSL elevation which means 2 feet of soil will have to be excavated to accommodate a 440 MSL elevation spillway.
4. four 133,000 gallons per minute pumps to pump water in and out of the site will be placed at the Illinois River near the historic Copperas Creek locks, which will allow the site to be flooded in 14 days
5. a 6,700 foot discharge channel will be constructed and articulated concrete mat will be layered in the bottom of the above referenced channel at an estimated $1,134,653; during flood stage the articulated concrete mat will be inundated with as much as 15 feet of flood water

8. after a project that been under consideration for a period of 23 years beginning in 1987 engineering plans from the Corps, as well as the Illinois Department of Natural Resources does not appear to have required wildlife consultations for impacts on this area completed
9. many of the problems at the site are due to lack of state funds to maintain current equipment and poor site management
10. the public questions how the Illinois DNR will provide adequate funds for the additional costs of operating the new pumps, ditch and channel maintenance, levee maintenance which is estimated at a cost of $49,117 annually; this number far exceeds the funds available over the past years which contributed to a lack of maintenance of the area.
11. the proposed goals of this project are to enhance wetland, aquatic and existing wetland habitats, yet the best estimate by the Corps is a success rate of 30% for moist soil plants production over a ten year period
12. construction disturbance for this project is expected to be at least three years, causing disruption to species and habitat loss

In conclusion I am asking for an immediate stay on this project and an investigation into the levee and spillway heights and river levels documentation; necessary endangered and threatened species reviews; and cost-benefit analysis of this project. Your prompt attention to this matter is requested and appreciated.

Sincerely,

John R. Grigsby Sr.



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Pat Quinn, Governor
Marc Miller, Director

August 4, 2010

Senator David Koehler
13 S. Capital St.
Pekin, IL 61554

Re: Rice Lake SFWA Corps EMP

Dear Senator Koehler:

Thank you for forwarding your constituents letter to my attention. I believe it is important to understand why the IDNR and Corps are directing resources to the Rice Lake Fish and Wildlife Area (Rice Lake), and hope that the information below provides a better understanding of the project. To your constituents concerns:

Why are we building this project? Increased flood and sedimentation levels have resulted in degradation of what has historically acted as excellent mid-migration waterfowl and aquatic habitat. The lack of reliable and flexible water management capability over half of the project area severely limits its effectiveness in providing feeding and resting habitat for the 2.7 million annual waterfowl use days. Habitat degradation also has negatively affected the other migratory and resident species using the facility.

The project goals are to enhance wetland, aquatic, and floodplain terrestrial habitat.

PROJECT FEATURES:

- Reestablish the Hate Levee with a riprap over-flow structure to function as the major water control facility for the entire complex;
- Locate a pumping facility on the Illinois Waterway;
- Excavate channels for water supply to management areas;
- Install two fish passage structures;
- Construct interior levees for moist soil management achieving a 40% drawdown success ratio; and,
- Plant mast trees and native grasses on Duck Island.

The levee construction is not intended to hold out floods. This is a back water of the Illinois River. The intent is to hold small bumps in the river during the prime growing period during the summer.

The spillway is designed on the concept of the old Hate Levee. This will allow water to enter the site in a more traditional manner.

Reestablishing the Hate Levee and installing a 133,200 gpm pumping facility for Big Lake would increase reliability and flexibility of water level management. Habitat would be improved for waterfowl, wading birds, shorebirds, and other wetland species that utilize the area. Structures for fish passage and escapement would protect aquatic habitat and maintain connectivity with deep water areas. Restoration of native grasslands and mast tree species would enhance habitat for numerous floodplain species. Pumps will only pump water in, not out to the River.

What about the endangered and threatened species in the area? Mitigative measures to minimize impacts on significant wildlife have been incorporated into the planning. Site visits during tree cutting selection was offered to local residents and Mr. Terry Ingram, Executive Director and President of the Eagle Nature Foundation. Construction will be regulated by season to avoid breeding and nesting periods. Vegetation will be protected through fencing in critical areas to restrict site work. A Comprehensive Environmental Review Process (CERP) has been completed and approved, by the Department, for threatened and endangered species, natural areas/nature preserves, wetlands and cultural resources.

How will IDNR make sure that OM&R is in place? Estimated O&M is $34,117.00/year. The Illinois Department of Natural Resources will operate and maintain this facility as designed for the life of the project

Do the design elevations make sense based on the sites planned management? The Corps of Engineers are the designers and construction management leaders on the project. However, IDNR review the plans and specifications once completed for consistency with the overall plan. My staff will carefully study the design based on the project purpose, and reach consensus with the Corps on the necessity of each elevation and the projects operational integrity.

The management of Rice Lake is currently controlled by the IDNR's Master Management Plan; by River conditions; and, by funding available to maintain existing infrastructure. Over the past 21 years, the management of this site and the overall goals has not changed. The Site Manager tries to achieve draw down to promote moist soil growth and recharge in order to provide mid-migration habitat. These types of decisions are made in consultation with senior management staff in Springfield as well as other Site Superintendents. My staff has done an exemplary job in site management during a difficult decade of climatic variations, as well as state fiscal restraints.

This project will significantly improve the operation of the site, and improve the habitat as well as the recreational experience of visitors. Please feel free to contact Rick Mollahan of my staff at 217/785-8264 if there are continued concerns or a need for further discussions.

Sincerely,

Marc Miller
Director

CC: Kyle Dooley. Office of State Senator Dave Koehler

Bcc: Rick Mollahan
Debbie Bruce
Jim Herkert
Tim Hickmann
Bill Douglass
Art Neal
Marvin Hubbell, Rock Island Army Corps of Engineers
Darron Niles, Rock Island Army Corps of Engineers

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX B
CLEAN WATER ACT,
SECTION 404(b)(1) EVALUATION

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APPENDIX B
CLEAN WATER ACT,
SECTION 404(b)(1) EVALUATION

I. PROJECT DESCRIPTION

A. Location. The proposed project is located on the right descending bank of the Illinois River (River Miles 132.0 - 138.0) in Fulton County, Illinois. The Rice Lake State Fish and Wildlife Area (SFWA) was purchased and is managed by the Illinois Department of Natural Resources (DNR) for the purpose of providing consumptive and nonconsumptive enjoyment of fish, wildlife, and natural habitats. The area comprises approximately 5,600 acres of primarily backwater lakes and floodplain forest. (See plates 1 and 2 of the Definite Project Report (DPR).)

B. General Description. The Rice Lake Habitat Rehabilitation and Enhancement Project (HREP) is proposed to enhance wetland, aquatic and floodplain habitats by increasing the success rate for emergent and moist-soil vegetation, increasing food and cover for wildlife, and providing access to deepwater areas for fish. Measures to accomplish these objectives will include construction of a perimeter water control spillway and gated culvert for passive water level control; increasing water level management capability through construction of a new pump station and associated interior distribution channels; construction of fish access structures between the shallow water and deepwater areas within the SFWA and between the SFWA and the Illinois River; and planting native herbaceous and mast producing tree species on the cropfields of Duck Island within the SFWA. By definition and Federal regulatory jurisdiction, much of the site is classified as wetland or as "waters of the United States" and is therefore subject to evaluation and regulation under Section 404(b)(1) of the Clean Water Act.

C. Authority and Purpose. The authority for this action is provided by the 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662). Section 1103 is summarized in the DPR.

The purpose of this project, under Section 1103, is "to ensure the coordinated development and enhancement of the Upper Mississippi River (UMR)." The project is the result of planning efforts by the State of Illinois, the U.S. Fish and Wildlife Service (USFWS), and the U.S. Army Corps of Engineers.

D. General Description of Dredged and Fill Material. Perimeter water control spillway construction will require approximately 130,000 cubic yards (cy)of material. Approximately 45,000 cubic yards of sand will be hydraulically dredged from the Illinois River. This material will be obtained from a nearby reach of the navigation channel that has required frequent dredging in the recent past. Dredged sand will be temporarily stockpiled along the shoreline of Goose Lake. The rest of the material (approximately 85,000 cy) will be obtained from the Duck Island gravel pit. The alignment of the water control spillway will be stripped of topsoil prior to placement of the stockpiled sand. Following placement and shaping of the sand material, the spillway structure will be capped with the stripped topsoil material and reseeded. Material excavated from the distribution channels associated with pump station development will be placed on the adjacent bankline or used to rehabilitate existing levee structures in the smaller management units. Soils in the spillway and channel construction areas are primarily of the Titus-Beaucoup-Tice association and are deep, nearly level, somewhat poorly to poorly drained, clayey, and silty soils that formed in alluvium on flood plains.

E. Description of the Proposed Placement Site. Construction of the perimeter water control spillway, pumping facilities, and distribution channels will involve placement of dredged and fill material on areas currently covered by herbaceous and woody vegetation, or by sand and mud. Placement sites will be allowed to revegetate naturally, reseeded to native herbaceous species, or riprapped as needed.

Construction activities are anticipated to last at least one construction season (May through October). If bad weather, high water or other circumstances arise, construction will carry on to the next season.

Transportation of borrow material will be primarily on existing roadways or other disturbed areas. Any temporary haul roads or stockpile areas built in wetlands will be degraded to original contour once the project is completed.

Planting of native herbaceous and mast tree species on the Duck Island peninsula will take place in areas not identified as jurisdictional wetland. Consequently, this activity is not addressed in detail in this evaluation.

F. Description of the Placement Method. Approximately 55,000 cy of clayey material for the perimeter spillway structure will be found adjacent to the spillway alignment or mechanically dredged from Goose Pond. The borrow material will be graded and shaped using bulldozers and other mechanical means during spillway construction.

The pump station will require a concrete pad, as well as construction of inlet and discharge pipes. The discharge channel will be excavated by mechanical means. The fish egress structures will involve construction of 9 foot x 7 foot box culverts through a causeway that separates Rice Lake from the Duck Island gravel pit and through the new perimeter spillway separating Goose Lake from the Illinois River.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

1. Substrate Elevation and Slope. The main channel of the Illinois River is considerably lower (up to 10+ feet) than the proposed placement sites. Within the project area, existing elevations of placement sites range from approximately 442 feet to 432 feet.

2. Sediment Type. Substrate materials to be dredged would consist of medium to fine sand with little or no organic content.

3. Dredged/Fill Material Movement. The main channel of the Illinois River is characterized by an unstable sand substrate. This substrate would eventually be covered with material of similar character. The placement sites are located in areas that are relatively sheltered from higher current velocities.

4. Physical Effects on Benthos. Any immobile benthos present in shallow water/mudflat placement sites would be buried as a result of construction activities.

5. Actions Taken to Minimize Impacts. Constructed embankments are designed with gradual slopes to minimize erosion or other movement of dredged material.

B. Water Circulation, Fluctuation, and Salinity Determinations

1. Water. No significant differences in water chemistry are expected following project construction, and no violations of applicable State water standards are anticipated.

2. Current Patterns and Water Circulation. No significant effects to existing current patterns or water circulation are expected to result from this action.

3. Normal Water Level Fluctuation. Fluctuations in the adjacent Illinois River system, both daily and seasonal, depend on discharge changes, lock and dam operations, and seasonal weather patterns. Project implementation is not expected to affect normal river stages or flood heights. The relatively low height of the water control spillway ensures that the structure will be overtopped at the spillway on an annual basis and will overtop along its length in at least 50 percent of the years throughout the life of the project.

Proposed water control operations call for a 1-to 2-foot fluctuation on both Rice Lake and Big Lake for wildlife management purposes, primarily in summer and fall. The managed water level fluctuations are anticipated to vary from without-project conditions in timing but not in scope; in fact, it is expected that interior water level fluctuations will be more predictable, more gradual, and possibly less extreme under with-project conditions.

4. Salinity Gradient. This consideration is not applicable in the location of the proposed project.

5. Actions Taken to Minimize Impacts. The water control spillway alignment was designed to take advantage of existing roadways and high ground paralleling the Illinois River in order to minimize the size of the placement area and the quantity of fill material required for project construction. Excavation of distribution channels for additional water control facilities will primarily involve work in existing ditches and other previously disturbed areas. The use of on-site borrow material and material dredged from a chronic shoaling area of the Illinois River to meet a portion of construction requirements is intended to minimize impacts to the aquatic ecosystem.

C. Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Placement Site. Construction activities would increase turbidity in existing water bodies in the short term. A return to ambient conditions should occur shortly after completion of construction. No long-term impacts to suspended solids and turbidity levels are anticipated.

2. Effects on Physical and Chemical Properties of the Water Column. Some minor short-term increases in suspended particulates and turbidity levels could occur in the immediate vicinity of construction activities. These effects would be limited in both scope and duration. No significant differences in water chemistry are expected following project construction.

3. Effects on Biota. Sessile organisms within the construction zone will likely be destroyed by clearing or filling activities. Dredging and placement of fine material is not expected to have toxic effects on fish, wildlife, or other aquatic organisms. No long-term adverse effects to biota would be anticipated to result from this action. The overall impact of the HREP project is expected to be beneficial to biota in the project area and the river system.

D. Contaminant Determinations. Construction activities are not expected to increase total suspended solids or to change pH or dissolved oxygen levels. Any contaminants introduced into the Rice Lake SFWA or adjacent river systems are not expected to differ from those ordinarily found in these systems. The sandy material to be dredged is of large enough particle size so that contaminant binding is negligible. Historically, sediment sampling of sandy dredged material has shown an insignificantly low level of contamination, since contaminants have a greater affinity for smaller-sized particles.

Possible introduction of equipment or construction-related contaminants would be controlled by adherence to runoff monitoring plans during construction activity. No toxic materials would be introduced to the area as a result of construction activities. Appropriate measures, such as the placement of hay bales or silt fences, would be implemented to control stormwater discharge. Should any such discharges occur, they would be contained on site.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton and Nekton. Only short-term and minimal effects are anticipated to occur as a result of dredging. No significant impacts to either plankton or nekton are expected.

2. Effects on Benthos. (See Section 2.A.4 *Physical Effects on Benthos*, page D-3.) No significant impacts to benthos either at the location of hydraulic dredging or at the placement site is anticipated.

3. Effects on Aquatic Food Web. Only short-term and minimal impacts would be expected to occur during the construction period. No long-term adverse effects to the aquatic food web are anticipated to result from this action.

4. Effects on Special Aquatic Sites. No vegetated shallows, coral reefs, or riffle and pool complexes are present in the project area. No adverse impacts to mudflats are anticipated. The proposed action is expected to have an overall beneficial effect on wetland wildlife, wetland functions and values, and sanctuaries and refuges. Project planning considered to the full extent the minimization of wetland loss, and it is anticipated that wetland values would be improved as a result of project implementation.

5. Threatened and Endangered Species. Correspondence from the USFWS (see Appendix A) indicates that no impacts are envisioned to threatened or endangered species or their habitats, provided that construction activities are scheduled and monitored to avoid direct impacts to these species.

6. Other Wildlife. Wildlife species which utilize nonforested wetland habitats should benefit in the long term from the proposed action. Species which utilize forested wetlands should not be adversely affected by the removal of approximately 4.8 acres of trees from the perimeter spillway alignment and conveyance channels.

F. Proposed Placement Site Determinations

1. Mixing Zone Determinations. Discussions pertaining to turbidity and suspended particulates are summarized under Section II. C.2, *Effects on Physical and Chemical Properties of the Water Column*, page D-4 Contaminants were discussed previously under Section II. D, *Contaminant Determinations*, page D-4. The large capacity of the navigation channel should provide an adequate mixing zone for any contaminated sediments that may be present. As mentioned earlier, most contaminants have affinities for finer sediments than are found at either the dredge cut or the placement location.

2. Determination of Compliance with Applicable Water Quality Standards. An application for State water quality certification under Section 401 of the Clean Water Act is being submitted to the Illinois Department of Natural Resources, Office of Water Resources.

3. Potential Effects on Human-Use Characteristics. Implementation of the proposed project will have no significant adverse effects on municipal or private water supplies; recreational or commercial fisheries; water related recreation or aesthetics; parks; national monuments; or other similar preserves. Any adverse impacts will be minimal and of short-term duration.

G. Determination of Cumulative Effects on the Aquatic Ecosystem. The project would have positive benefits to aquatic resources found on the site. Temporary turbidity impacts may occur on and off site, but would be short-term in duration. No cumulative negative impacts are anticipated to occur. Beneficial impacts are expected to occur on site for wetlands, wetland wildlife, and fish. Long-term productivity would be enhanced with the habitat improvements that are proposed.

H. Determination of Secondary Effects on the Aquatic Ecosystem. The existing rate of sediment deposition in the project area is not expected to change significantly as a result of project implementation. Although material would be pushed into some of the interior water bodies, this would not significantly contribute to degradation of these waters. Creatures utilizing these water bodies should benefit from the physical conditions that the structure would create when managed to meet site objectives.

SECTION III. FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON PLACEMENT

1. No significant adaptations of the 404(b)(1) guidelines were made relative to this evaluation.

2. Alternatives which were considered for the proposed action were as follows:

Alternative A - No Federal Action

Alternative B - Preferred Alternative. The recommended plan includes construction of a perimeter levee at 442 top elevation/440 spillway elevation, new pumping capacity for Big Lake and Rice Lake, fish access to Duck Island gravel pit and Illinois River, and conversion of Duck Island cropfields to 352 acres native forest and 57 acres native wet meadow/grassland.

Alternative C - Management features considered but not selected included restoration of the Senate Island side channel, and conversion of Duck Island cropfields to a single cover type (forest or wet meadow/grassland).

3. Certification under Section 401 of the Clean Water Act will be obtained from the Illinois Department of Conservation and will be included in the final version of this report. The project will therefore be in compliance with the water quality requirements of the State of Illinois.

4. The project will not introduce toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.

5. No significant impact to federally-listed endangered species will result from this project. This determination is supported by the USFWS, Ecological Services Office, Rock Island, Illinois.

6. The project is located along a freshwater inland river system. No marine sanctuaries are involved or will be affected, and no degradation of waters of the U.S. is anticipated.

7. No municipal or private water supplies will be affected. There will be no adverse impact to recreational fishing, and no unique or special aquatic sites are located in the project area. No long-term adverse changes to the ecology of the river system will result from this action.

8. Project construction materials will be chemically and physically stable. No contamination of the river is anticipated.

9. No other practical alternatives have been identified that would have less adverse impact on the aquatic ecosystem. The proposed project is in compliance with the guidelines for Section 404(b)(1) of the Clean Water Act, as amended. The proposed project will not significantly impact water quality or the integrity of the aquatic ecosystem.

10. On the basis of the guidelines, the proposed placement site for the discharge of dredged material is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

5 May 2010
(Date)

Gary R Midkiff
for Shawn P. McGinley
Colonel, U.S. Army
Commander and District Engineer

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA HABITAT REHABILITATION AND ENHANCEMENT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX C
BASELINE BIOLOGICAL MONITORING

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
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LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

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WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX C
BASELINE BIOLOGICAL MONITORING

I. PURPOSE

The purpose of this appendix is to discuss the results of baseline biological monitoring of herbaceous wetland vegetation, fisheries, and waterfowl performed at Rice Lake. Data will be compared against construction and post-construction phases to determine overall project success.

II. VEGETATION

Herbaceous wetland vegetation at Rice Lake is dominated by the shallow nature of the lake coupled with lake management practices. Typically, during the summer months the lake is drawn down to allow for the production of moist soil vegetation which is utilized as a food source by waterfowl.

Vegetation monitoring was performed by personnel of the Illinois Natural History Survey (INHS) under guidance of the US Geological Survey (USGS) as part of the Long Term Research Monitoring Program under the Environmental Management Program by the US Army Corps of Engineers (Corps). The INHS collected vegetation data in the LaGrange Pool from 1998 to 2004. The LaGrange Pool on the Illinois River is about 80 river miles long and extends from the LaGrange Lock and Dam to the Peoria Lock and Dam (figure C-1). Sampling occurred during two sampling windows of approximately 2 weeks each, in May and July. Lack of funding did not allow for vegetation data collected for years 2004 to 2008.

A. Methods. Sampling sites were distributed in shallow areas where water depth was less than 3 meters in 1998. After 1998, sampling sites were distributed where water depth was less than 2.5 meters. Sites were selected by a random number generator. Each site had six subsampling sites located around the boat, approximately 1.5 meters long and 0.35 meters wide (figure C-2).

Submerged aquatic vegetation was collected using a long-handled, doubled-headed rake. Teeth were divided and marked into five equal parts. Aquatic vegetation collected was referred to as submersed or rooted floating-leaf.

Individual species and different forms of aquatic vegetation were recorded as present or absent at each subsampling area based on visual examination and a rake sample. Rooted floating-leaf vegetation data were recorded as cover ratings based on percent overall cover (table C-1).

Sampling procedures are described in detail in Yin et al, 2000.

Appendix C
Baseline Biological Monitoring

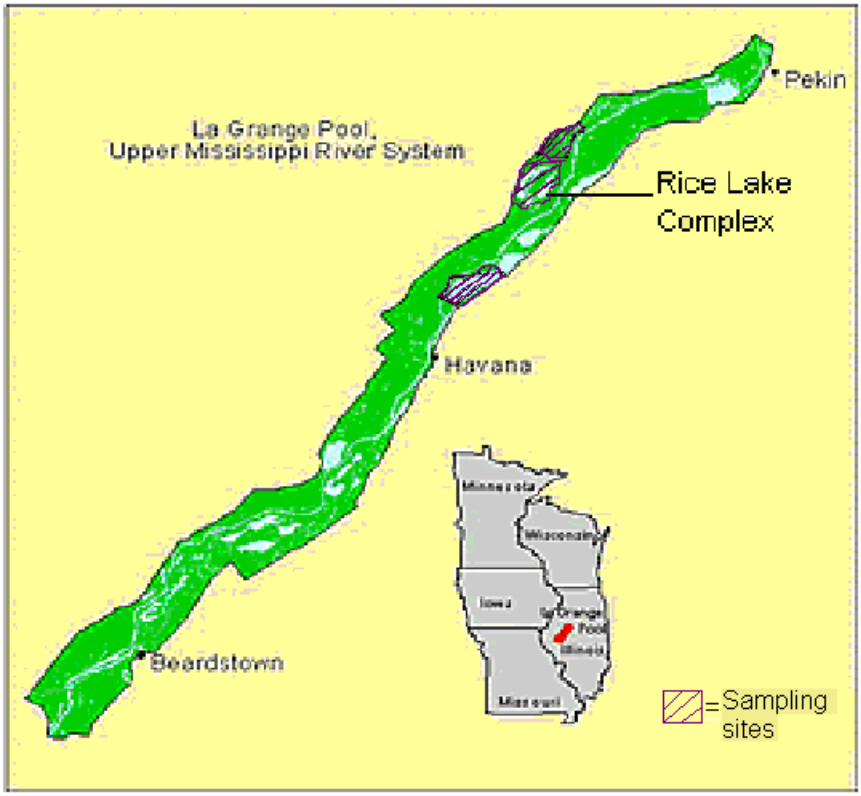


Figure C-1. The LaGrange Sampling Pool for Vegetation on the Illinois River
http://www.umesc.usgs.gov/reports_publications/ltrmp/water/srs/srs_study_areas.html#plg

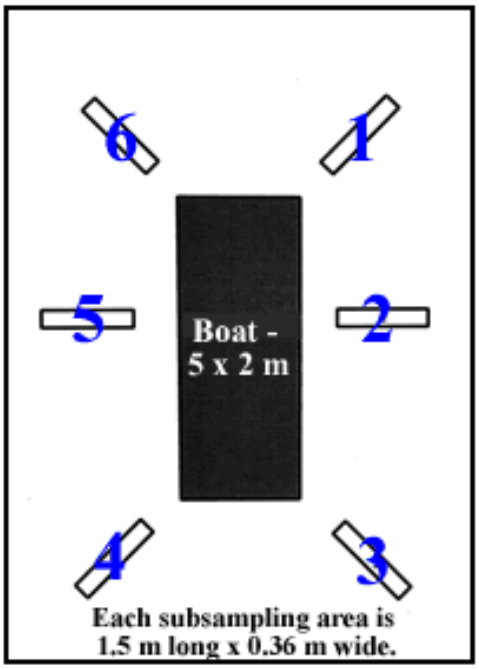


Figure C-2. Placement of the Subsampling Areas Around the Boat Identify Aquatic Vegetation by Visual Observations and the Rake Method

Table C-1. Cover Ratings Assigned to Vegetation During Sampling Based on a Percentage of Area Covered

% of Area Covered	Cover Rating
81-100	5
61-80	4
41-60	3
21-40	2
1-20	1
None	0

B. Results and Discussion. Results are for the LaGrange Pool as a whole, not just Rice Lake, Big Lake and Goose Lake. Results are representative of the Rice Lake Complex.

Eleven species of emergent and root floating-leaf vegetation were present in the LaGrange Pool, but no submerged aquatic vegetation (SAV) was found. The primary vegetation includes emergent species of broadleaf arrowhead (*Sagittaria latifolia*), river bulrush (*Schoenoplectus fluviatilis*), rice cutgrass (*Leersia oryzoides*), Japanese millet (*Echinochloa esculenta*), smartweed (*Polygonum* spp.) and spikerush (*Elocharis* spp.) (figure C-3). The rooted floating-leaf species include American lotus (*Nelumbo lutea*), primrose-willow (*Ludwigia ludwigia*), floating primrose-willow (*Ludwigia peploides*) and wingleaf primrosewillow (*Ludwigia decurrens*) (figure C-4). There were also filamentous algae present.

All of the emergent species create good habitat for migrating waterfowl. Seeds, roots, tubers, leafy parts and stems can all serve as a food source for different species of waterfowl (Low and Bellrose, 1944). This vegetation also creates an abundance of benthic aquatic invertebrates for waterfowl (Krull, 1970). More emergent vegetation could help reduce sediment resuspension in wetlands (Dieter, 1990). The Japanese millet is planted by staff at the ILDNR to provide a supplemental food source for migrating waterfowl.

American lotus was the dominant rooted floating-leaf species from 1999 to 2004. Lotus beds can be good roosting habitat for wildlife. Current water level conditions at Rice Lake have been high since 2004 and lotus beds have seen a marked decrease.

C. Conclusions and Potential Post-Construction Outcomes. Currently there is poor diversity of vegetation in the LaGrange Pool, with only eleven species. This creates a paucity of diverse vegetation habitat for wildlife. Most all of the vegetation present provides some type of cover, habitat, or food for wildlife; however, greater diversity of vegetation will attract greater diversity in waterfowl and other wildlife.

Exposing mud flats during the drawdown would allow more emergent species to become available, and would allow germination and growth of herbaceous annual vegetation which provides an important natural food source for migratory waterfowl. Emergent vegetation creates habitat for roosting and migrating shorebirds and waterfowl along with fish. It also creates habitat for benthic macroinvertebrates which are an important food source for waterfowl. Increases in the numbers of aquatic insects and their larvae, mollusks, and crustaceans would benefit migrating waterfowl.

Any submerged aquatic vegetation would be beneficial as habitat for fish or food for waterfowl. Submerged aquatic vegetation is not likely to establish in any of the lakes at the Rice Lake Complex due to flooding, Asian carp and wind fetch. Flooding brings in large Asian carp that would destroy any SAV. Flooding and Asian carp also create turbidity which prevents light penetration, a necessity for SAV to propagate. Flooding, even after construction of the 440.0 elevation spillway, will still occur bringing in more Asian carp and suspended sediments. Wind fetch is high at the Rice Lake Complex which creates large waves that also increase sediment resuspension.

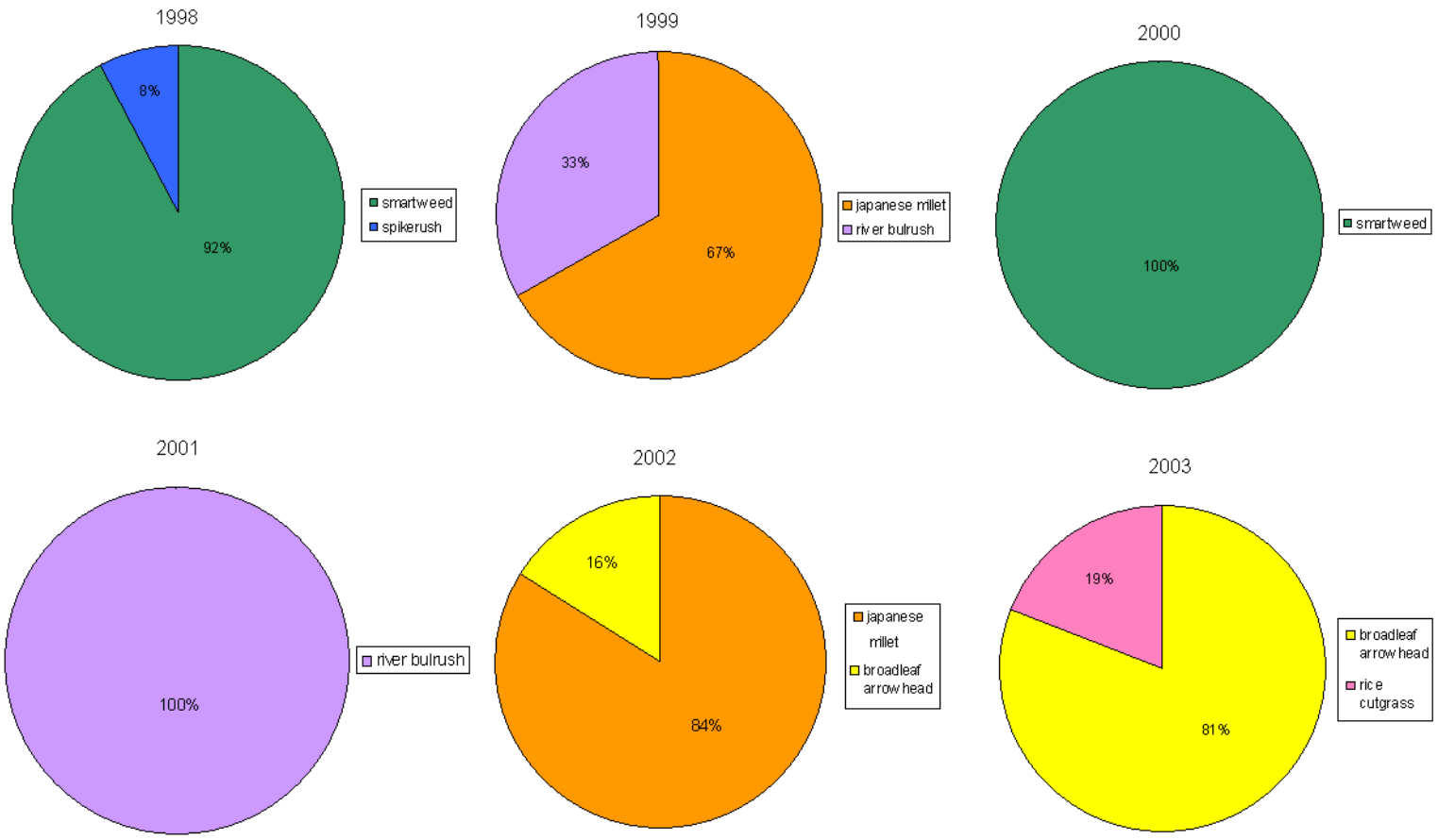


Figure C-3. Relative Frequency of Emergent Aquatic Vegetation for the LaGrange Pool on the Illinois River, 1998 to 2003

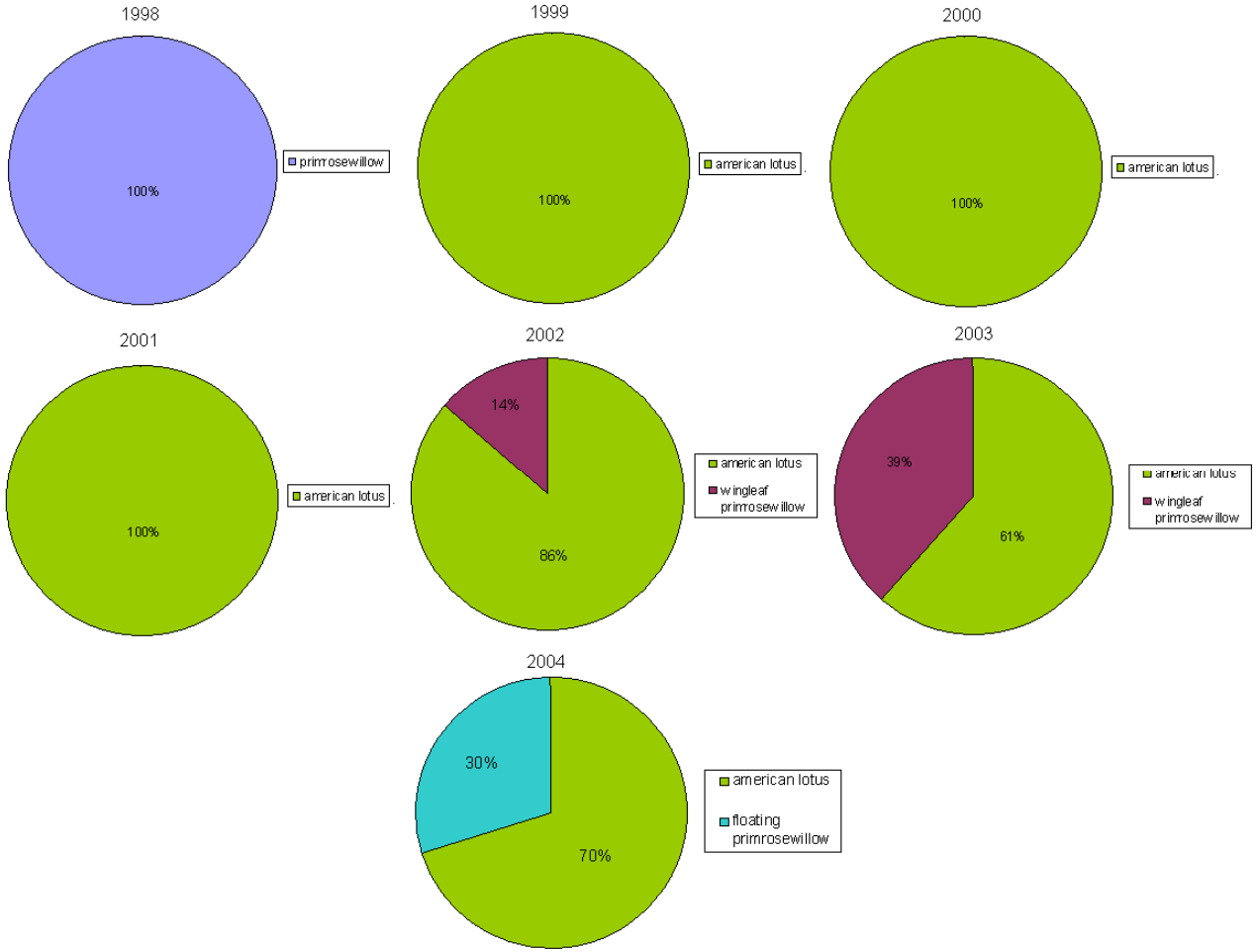


Figure C-4. Relative Frequency of Rooted Floating-Leaf Species in the LaGrange Pool, 1998 to 2004

III. FISHERIES

Rice Lake lacks deep water habitat for fish to retreat during summer stress periods and to overwinter. There is deep water habitat in Quarry Lake (figure C-5), but it is currently inaccessible to fish in Rice Lake. Fish in Goose Lake, Beebe Lake and Big Lake all have access to Quarry Lake. These lakes currently do not have a water control structure to control water levels and are completely regulated by the Illinois River.

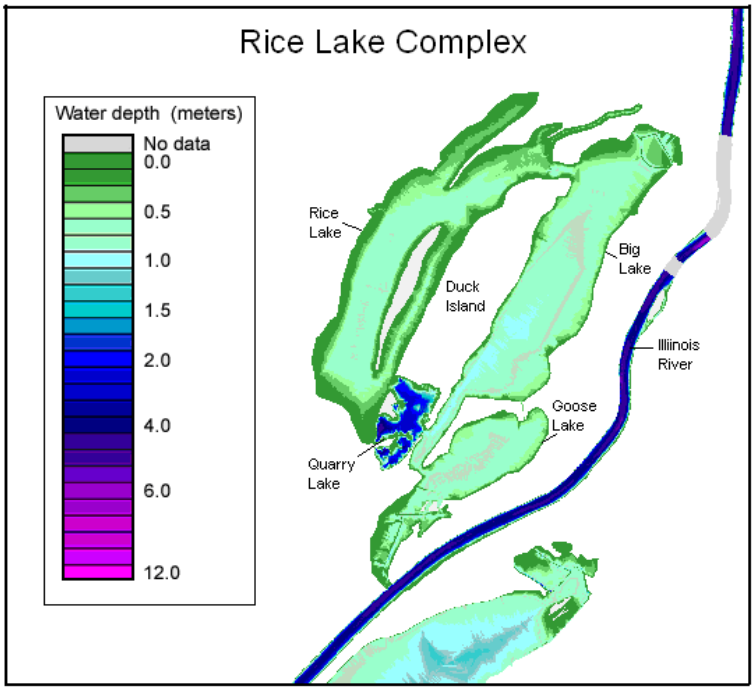


Figure C-5. Bathymetry Data of the Rice Lake Complex.
http://www.umesc.usgs.gov/aquatic/bathymetry/viewable/lgbath.html

Fish in Rice Lake experience severe conditions in the summer during the drawdown. Typical water depths during this time range from 1 to 3 feet. Water temperatures fluctuate greatly and commonly reach over 90^{o}F, dissolved oxygen (D.O) concentrations can dip below 5.0mg/L, and pH can exceed 9.0 during a typical summer day (see water quality appendix). The acceptable pH range is 6.5 through 9.0 and D.O. concentrations should not be less than 5.0 mg/L at any time. All of these conditions are lethal for fish.

Rice Lake has also experienced several large fish kills since 2003. In July 2003, after the drawdown in Rice Lake, a severe fish kill of approximately 38,044 fish was observed. These dead fish were mostly natives. In late July/early August of 2005 low D.O. caused a fish kill of approximately 50,000 large Asian and common carp. Again in late July/early August of 2006 and 2007 another fish kill occurred on Rice Lake. The 2007 fish kill was caused by severe low D.O. and hot weather conditions. A majority of these dead fish were large bighead, grass and silver carp. During these same time

frames no fish kills occurred in Big Lake, ostensibly because the fish were able to take shelter from high temperatures and low dissolved oxygen concentrations in the deeper water of Quarry Lake.

In early spring and late summer of 2008 the Illinois River was above flood stage, bringing in more species of fish than usual, larger numbers of each species, and overall larger individuals of each species.

A. Methods. The fisheries component of Rice Lake is done by the Illinois Department of Natural Resources (ILDNR) Fisheries Department. They do annual fish surveys by direct current (D.C.) electroshock fishing. D.C. electroshock fishing occurs in three sections of Rice Lake, two sections of Quarry Lake, and one section of Big Lake along Duck Island (figure C-6). Rice Lake is sampled in May before the drawdown, while Quarry Lake and part of Big Lake are sampled in July or August. Each section is done in 20 minute increments, with results recorded as catch per unit effort, index of condition and overall species composition. Catch per unit effort (CPUE) is the density of fish caught per minute. Index of condition is the average relative weight (Wr).

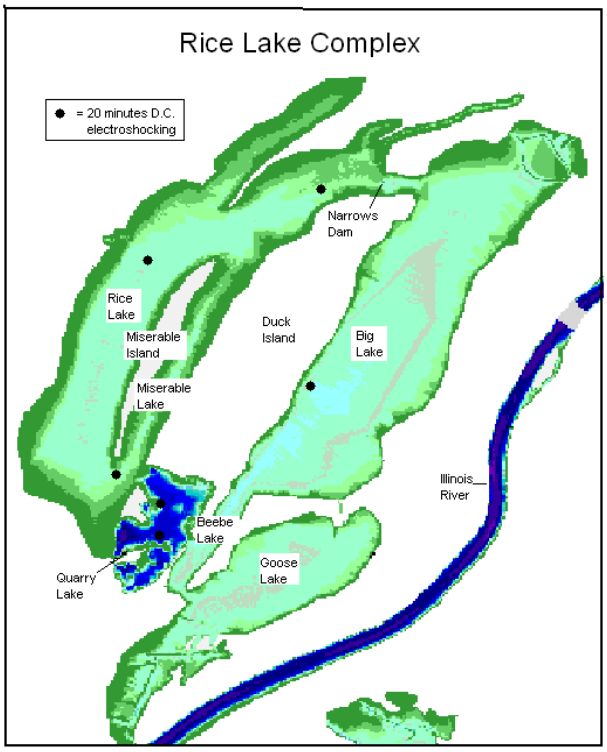


Figure C-6. Six D.C. Electroshocking Locations in Rice Lake Complex

B. Results and Discussion. Samples are collected and results recorded for Rice Lake (table C-2 and figure C-7) and Quarry Lake (tables C-3 and C-4 and figure C-8). Forty-four fish species, including three hybrid species, were collected from 1997 to 2008 from Rice Lake, Big Lake and Quarry Lake. Other species of fish caught in Rice Lake, Quarry Lake and/or Big Lake but not listed in any of the tables include bowfin, bullhead minnow, carp x goldfish hybrid, golden shiner, goldfish, mosquito fish, redear x green sunfish, skipjack herring, spotted gar, white perch and yellow bullhead. The fish species in the Rice Lake Complex are representative of a backwater/riverine fish community.

The number of sport fish in Rice Lake has decreased since 1996. Largemouth bass have not been caught during sampling since 2004. Bluegills have not had a sampling with the CPUE/min. above 1.00 since 2001. The overall number of fish caught using the D.C. electroshock decreased by 580 percent from 2006 to 2007. It decreased by 149 percent from 2005 to 2006 (table C-2 and figure C-7).

In early spring and late summer 2008, Rice Lake was at flood stage. This resulted in a much higher diversity and sport fish density in Quarry Lake when compared to previous surveys (tables C-3 and C-4).

C. Conclusions and Potential Post-Construction Outcomes. Putting in the fish egress from Rice Lake to Quarry Lake would allow fish to escape the severe conditions that occur in the summer and allow for overwintering habitat. This would reduce the likelihood of future massive fish kills. The fish egress from Goose Lake to the Illinois River would allow native fish species to return back to and potentially repopulate the Illinois River. The stop log structures that will be in the fish egress from Rice Lake to Quarry Lake will not allow for bidirectional movement. Fish would be allowed into Quarry Lake during the drawdowns, but not back into Rice Lake when water is being let in.

By allowing native fish species back out to the Illinois River it could negatively impact or deplete their numbers in Rice Lake. The 440.0 elevation spillway that the Corps would build as part of this project would not prevent flooding but is expected to reduce the number of times the complex is flooded during summer drawdown periods.

Table C-2. Rice Lake Fisheries Data Collected by the ILDNR Using D.C. Electroshock Fishing, From 1996 to 2007, Excluding 2002

	1996	1997	1998	1999	2000	2001	2003	2004	2005	2006	2007
Sample time (minutes)	80	56	84	79	61	55	47	58	48	53	32
# species	14	23	19	19	16	23	22	21	24	20	17
Largemouth Bass											
# Fish	3	29	3	13	9	3	1	2	0	0	0
CPUE Min.	0.05	0.51	0.04	0.16	0.14	0.05	0.02	0.02	0	0	0
Bluegill											
# Fish	38	81	23	21	131	58	17	50	36	26	11
CPUE Min.	0.5	1.41	0.27	0.26	2.14	1.05	0.36	0.86	0.75	0.49	0.5
Yellow Bullhead											
# Fish	27	2	0	0	35	22	3	34	27	2	4
CPUE Min.	0.33	0.04	0	0	0.57	0.4	0.06	0.59	0.56	0.04	0.18
Brown Bullhead											
# Fish	0	3	1	0	11	58	20	47	15	1	1
CPUE Min.	0	0.05	0.01	0	0.18	1.05	0.42	0.81	0.31	0.02	0.04
Black Bullhead											
# Fish	0	10	4	4	22	82	35	84	69	17	1
CPUE Min.	0	0.17	0.05	0.05	0.36	1.49	0.74	1.5	1.43	0.32	0.04
Carp											
# Fish	91	228	69	63	52	119	43	44	59	58	9
CPUE Min.	1.07	4.3	0.82	0.79	0.85	2.16	0.91	0.75	1.23	1.09	0.4
Bigmouth Buffalo											
# Fish	15	38	26	36	28	34	19	12	20	47	0
CPUE Min.	0.2	0.77	0.3	0.46	0.45	0.61	0.4	0.2	0.42	0.89	0
Sum of # Fish	174	391	126	137	288	376	138	273	226	151	26
Average of # Fish	24.9	55.9	18	19.6	41.1	53.7	19.7	39	32.3	21.6	3.71
Average CPUE	0.31	1.04	0.21	0.25	0.67	0.97	0.42	0.68	0.67	0.41	0.17

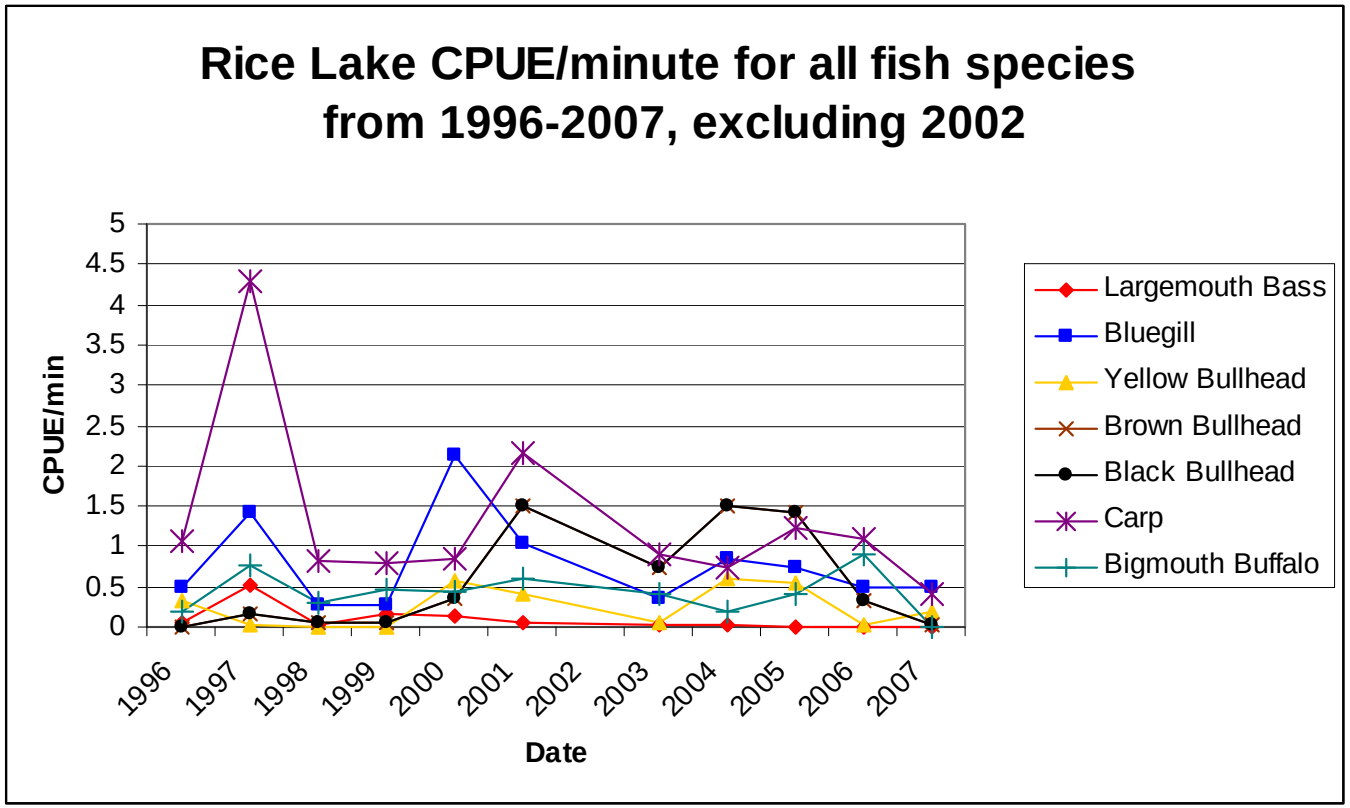


Figure C-7. Rice Lake Fisheries Data from 1996 to 2007, Excluding 2002, Recorded in CPUE/minute

Table C-3. Quarry Lake Fisheries Data Collected by the ILDNR Using D.C. Electroshock Fishing From 2003 to 2005 and 2008

	2003	2004	2005	2008
Sample time (minutes)	40	30	20	35
# species	19	17	15	27
Largemouth Bass				
# Fish	21	22	5	93
CPUE Min.	0.5	0.73	0.25	2.7
Size Range (inches)	4.3-20.1	3.5-18.1	2.4-15.7	2.8-16.9
Average Relative Weight (Wr)	103	122	89	114
Bluegill				
# Fish	45	41	11	112
CPUE Min.	1.1	1.37	0.55	3.2
Size Range (inches)	2.4-6.7	2.0-6.7	2.4-5.5	2.0-8.3
Average Relative Weight (Wr)	131	131	126	115
White Crappie				
# Fish	2	0	2	2
CPUE Min.	0.5	0	0.1	0.06
Size Range (inches)	7.5-8.7	0	8.1-9.2	7.9-10.2
Black Crappie				
# Fish	3	0	0	16
CPUE Min.	0.8	0	0	0.46
Size Range (inches)	7.9-10.2	0	0	7.5-11.4
Sum of # Fish	71	63	18	223
Average of # Fish	17.75	15.75	4.5	55.75
Average CPUE	0.725	0.525	0.225	1.605

Table C-4. Quarry Lake Fisheries Data Collected by the ILDNR Using D.C. Electroshock Fishing From Flooded Conditions in 2008

	# Fish in 2008
Bluegill	112
Largemouth Bass	93
Gizzard Shad	28
White Bass	25
Threadfin Shad	22
Smallmouth Buffalo	20
Freshwater Drum	19
Black Crappie	16
Green Sunfish	16
Orange Spotted Sunfish	15
Silver Carp	10
Bigmouth Buffalo	9
Black Bullhead	9
Carp	5
Flathead Catfish	4
Grass Carp	3
River Carpsucker	3
Brown Bullhead	2
Logperch	2
Quillback	2
Sauger	2
Warmouth Sunfish	2
White Crappie	2
Bluegill x Green sunfish	1
Channel Catfish	1
Golden Redhorse	1
Shorthead Redhorse	1

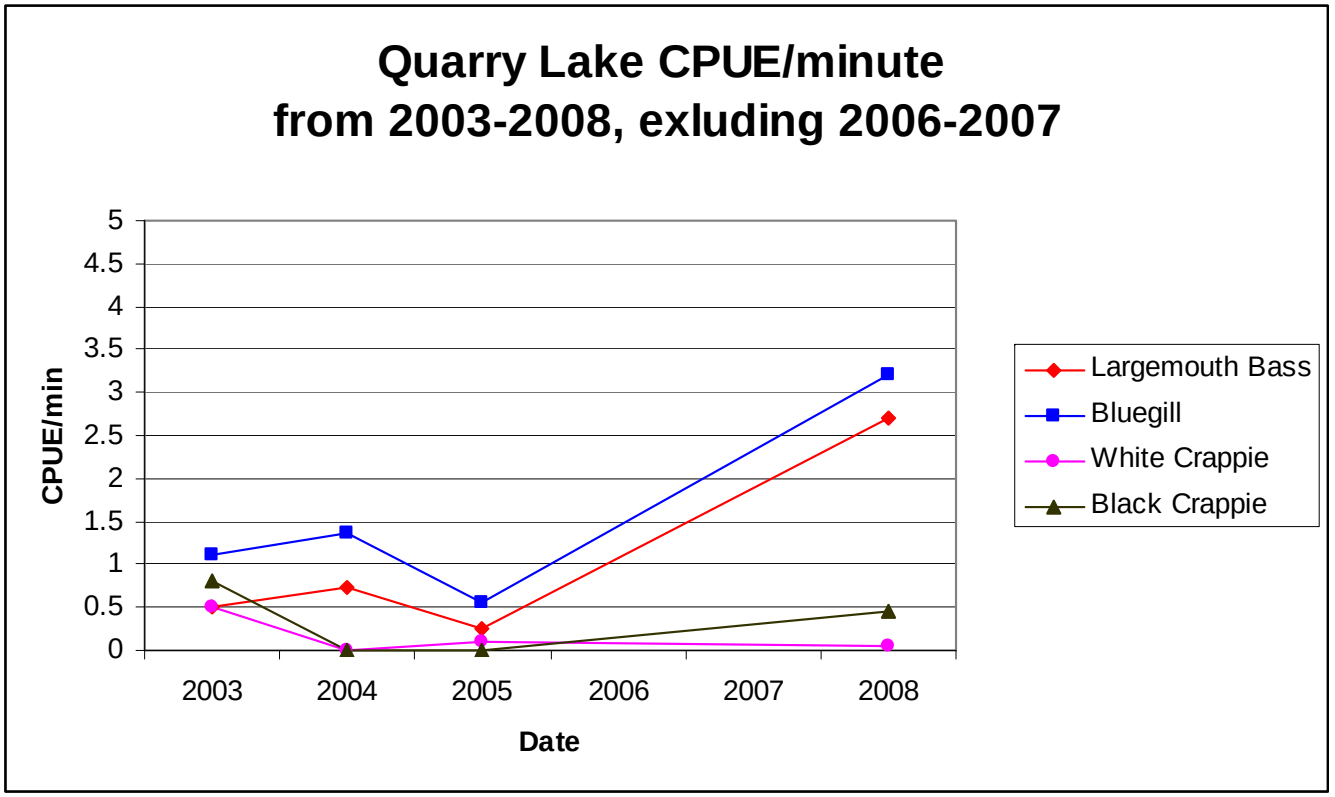


Figure C-8. Quarry Lake Fisheries Data Collected From 2003 to 2005 and 2008, Recorded in CPUE/minute

IV. WATERFOWL

The Rice Lake State Fish and Wildlife Area (SFWA) is a 2,290 hectare (ha) habitat that is an important migratory pathway for birds. There are three other refuges in close proximity to the Rice Lake SFWA which are also important for migrating waterfowl. The Chautauqua National Wildlife Refuge (NWR) was established in 1936, is 1,816 ha, and 8 kilometers downstream from Rice Lake. The Emiquon NWR was established in 1993 and is 86-ha. Banner Marsh SFWA was acquired in the 1980s, is 1,766-ha., and is directly upstream from Rice Lake SFWA (figure C-9).

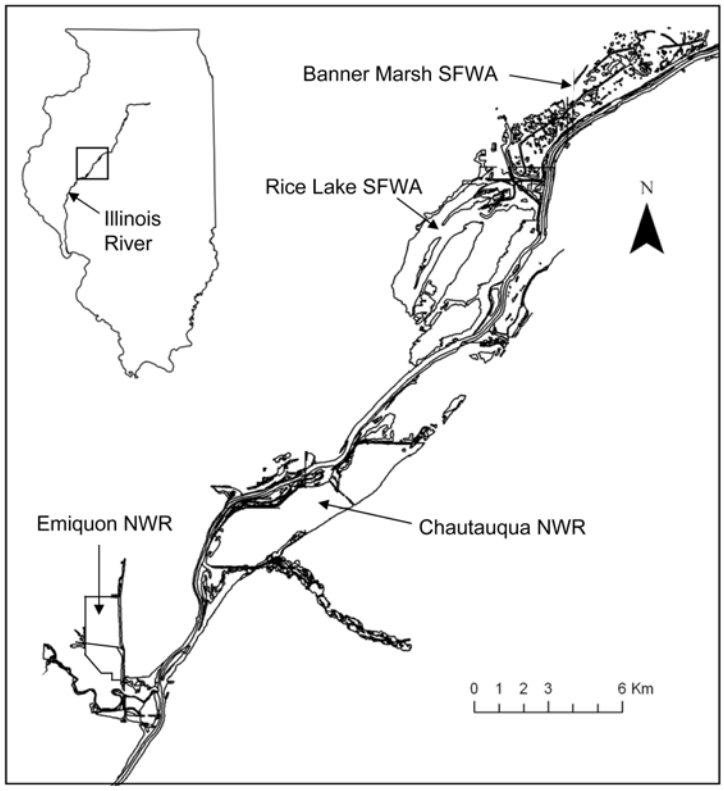


Figure C-9. Map Showing Locations of Banner Marsh SFWA, Rice Lake SFWA, Chautauqua NWR and Emiquon NWR in the Illinois River Valley (Hamer et al., 2008)

Rice Lake is hunted extensively with a total of twenty-three duck blinds, Goose Lake has four blinds and Big Lake has three blinds at the southeast end, for a total of thirty duck blinds (figure C-10). Hunting season for migratory waterfowl occurs from October to January, which encompasses the entire fall migration for waterfowl.

Waterfowl, specifically dabbling ducks, benefit greatly from exposing mudbanks by drawdowns and allowing a sufficient growing season for emergent vegetation and moist-soil plants to grow.

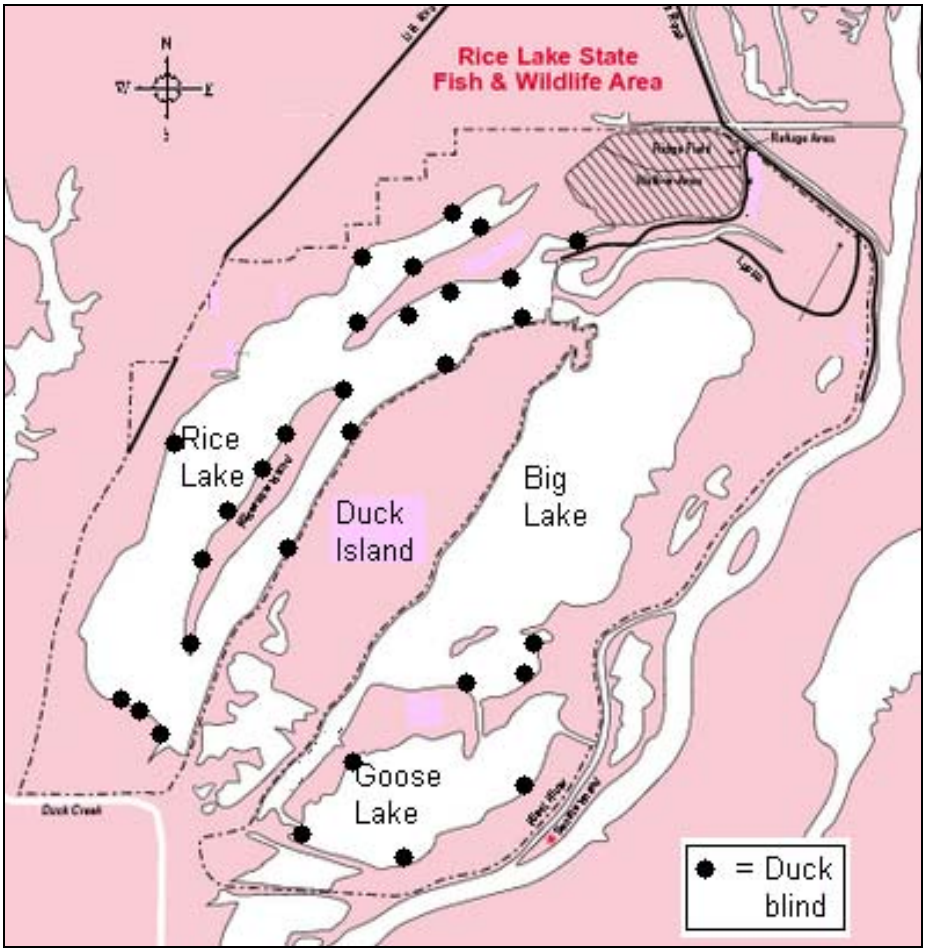
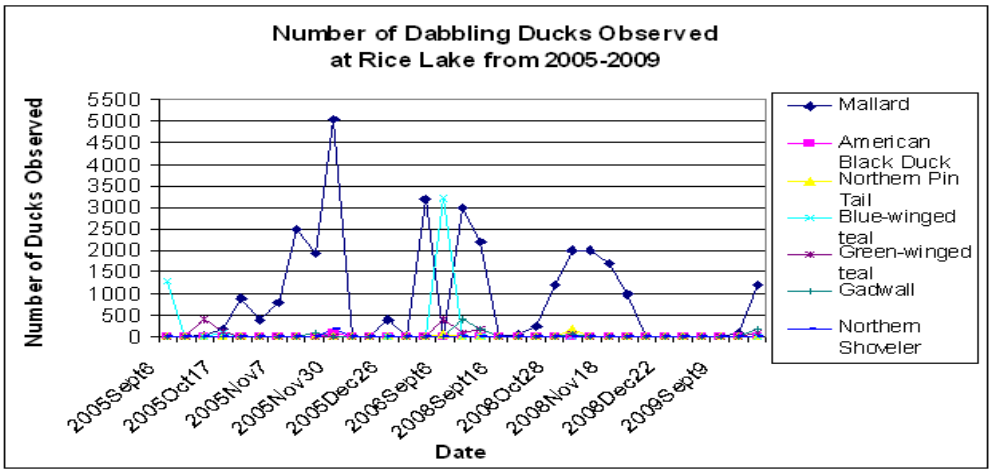
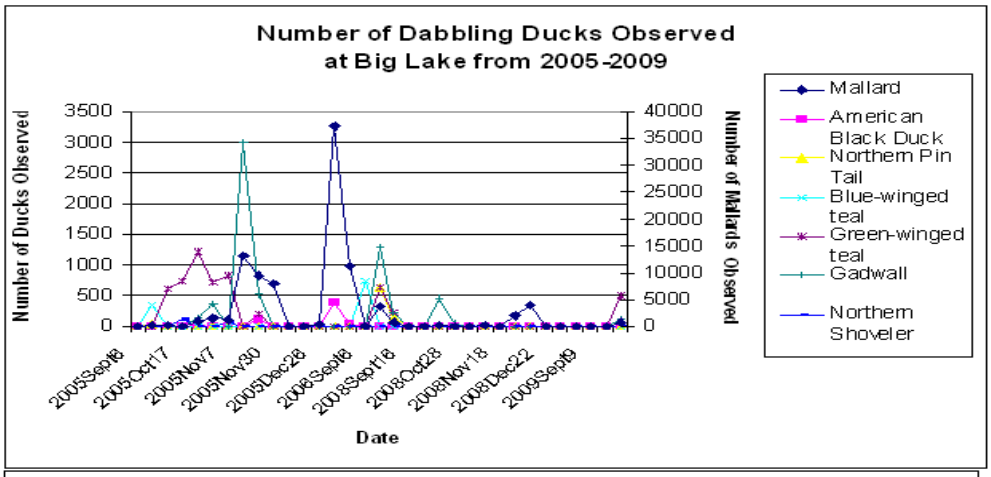


Figure C-10. Location of 30 Duck Blinds for the Fall Hunting Season at the Rice Lake SFWA

A. Methods. Waterfowl monitoring at Rice Lake is done by the Illinois Natural History Survey (INHS) as weekly aerial surveys from early September to early January. Results are recorded by species observed for Rice Lake, Big Lake and Goose Lake. The INHS does not do aerial surveys for the spring migration.

B. Results and Discussion. Eight species of dabbling ducks, five species of diving ducks, three species of geese along with American white pelicans (*Pelecanus erythrorhynchos*) and American coots (*Fulica americana*) are present in Rice Lake, Big Lake and Goose Lake (figures C-11, C-12 and C-13).





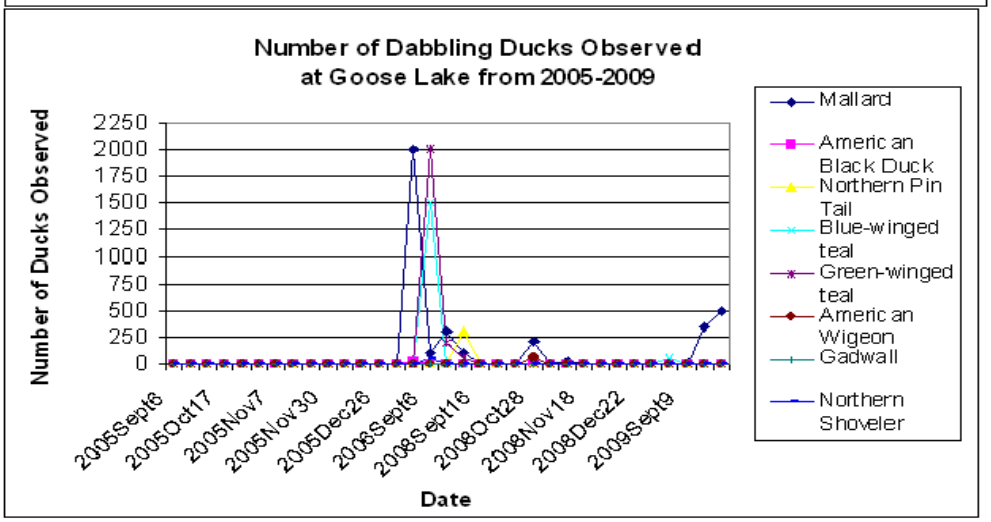
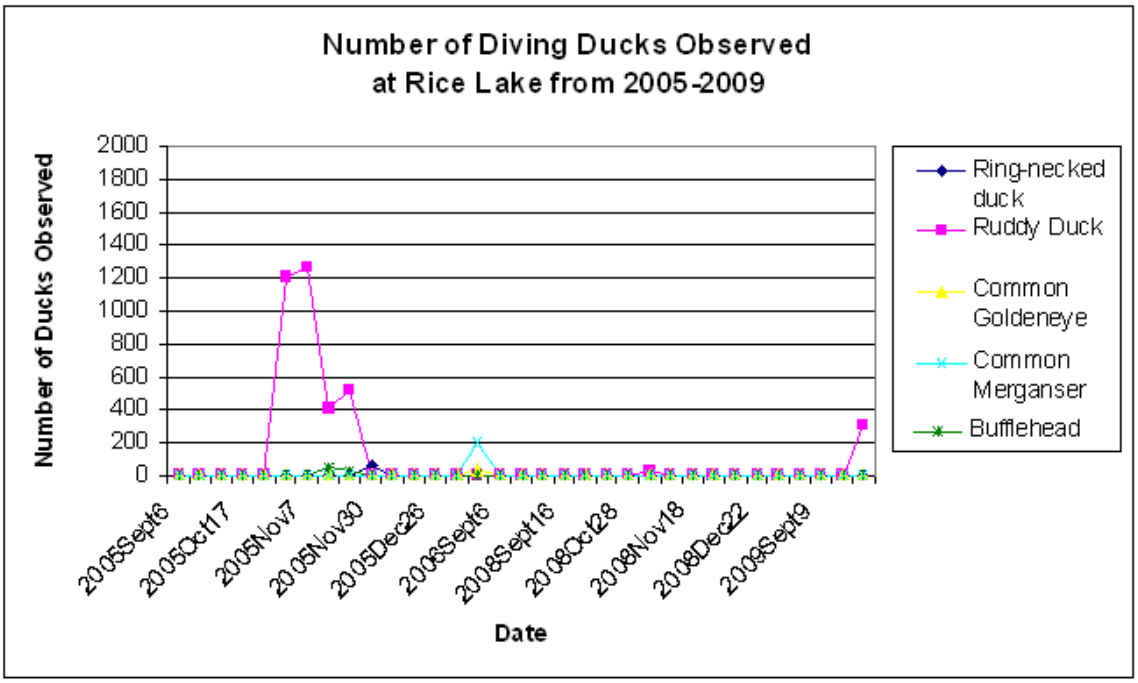


Figure C-11. Number of Dabbling Ducks Observed at Rice Lake SFWA From 2005 to 2009



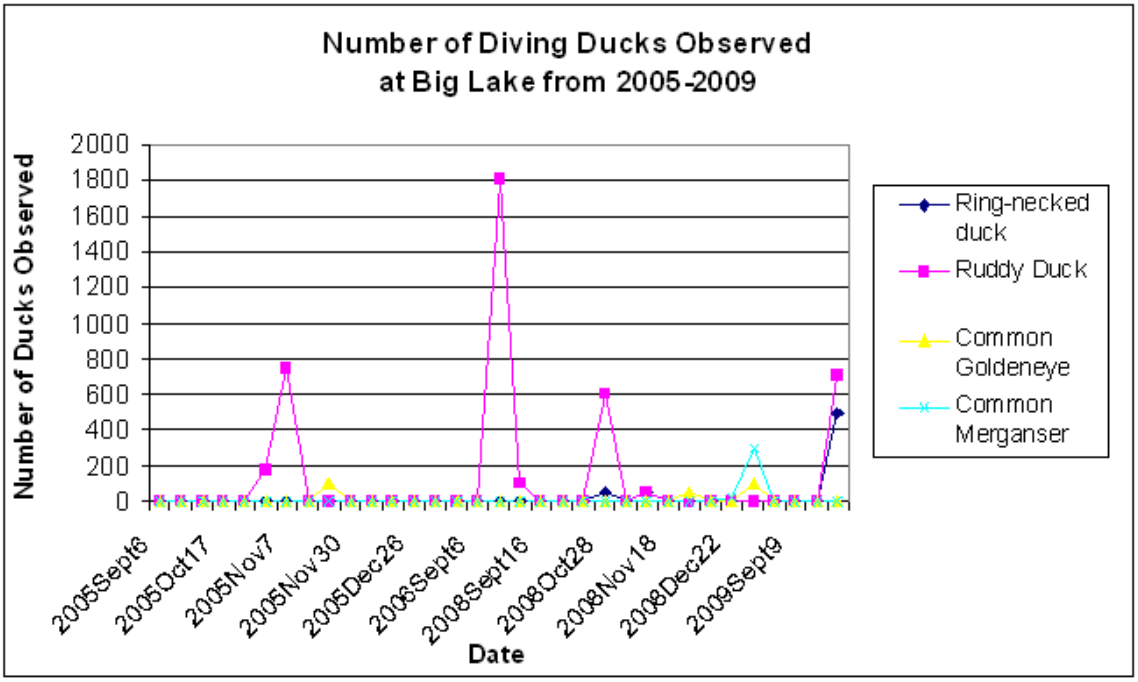


Figure C-12. Numbers of Diving Ducks Observed at Rice Lake and Big Lake, From 2005 to 2009; No Diving Ducks Were Observed at Goose Lake

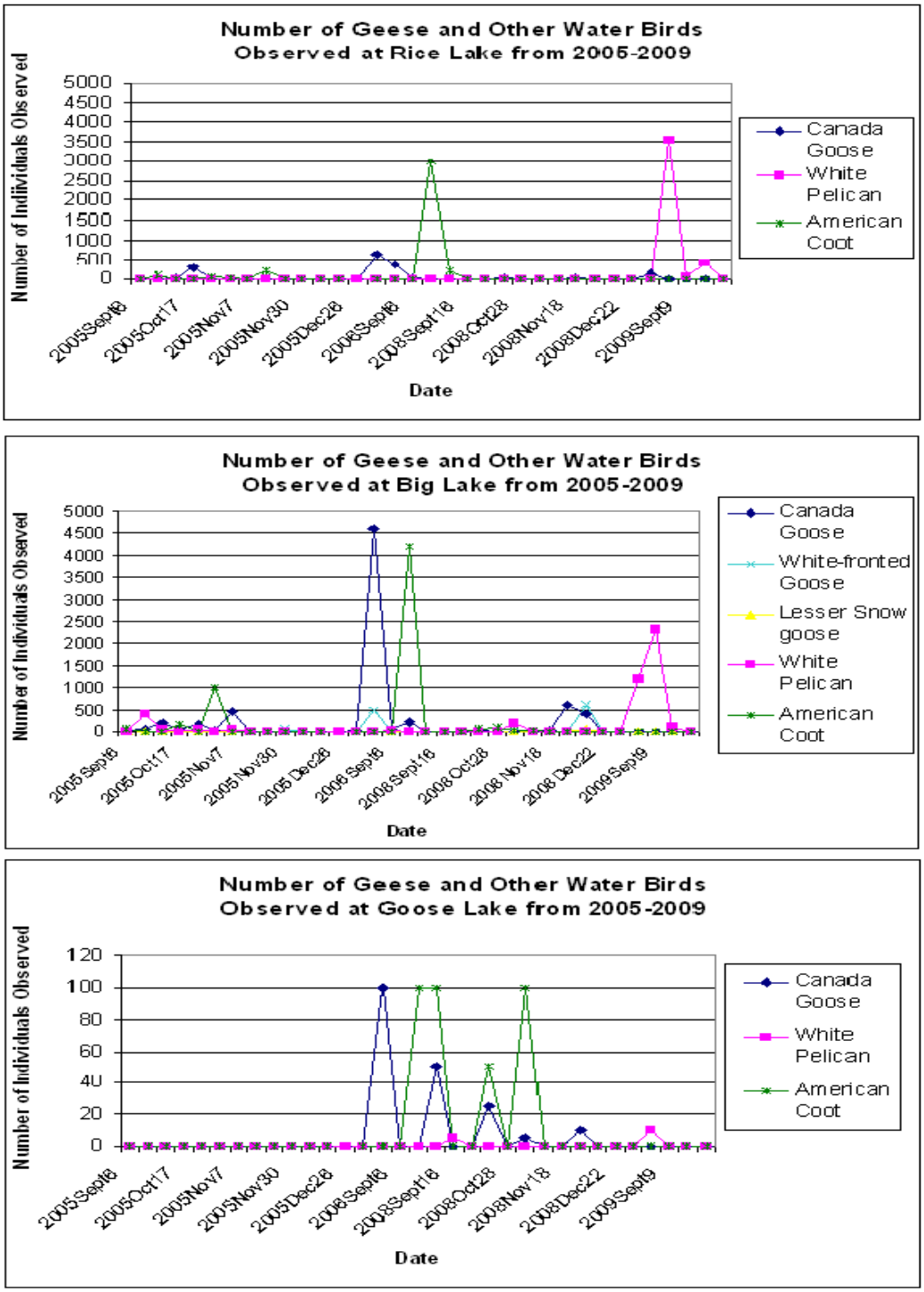


Figure C-13. Number of Geese and Other Water Birds Observed at Rice Lake From 2005 to 2009

The dabbling ducks include mallards (*Anus platyrhynchos*); blue-winged teals (*Anas discors*); green-winged teals (*Anas crecca*); gadwalls (*Anas strepera*); northern pintails (*Anas acuta*); American black ducks (*Anas rubripes*); northern shovelers (*Anas clypeata*); and American wigeons (*Anas americana*) (figure 11). Dabbling ducks feed on a variety of vegetation including seeds, rootlets, tubers and vegetative parts. Some common vegetation they feed on includes pondweeds, smartweeds, sedges, grasses, water milfoil, algae, and bulrush. They also feed on aquatic insects and their larvae, mollusks, crustaceans and amphibians. All dabbling ducks make use of planted vegetation and waste grains.

Mallards are the most common of all the waterfowl at Rice Lake SFWA, arriving almost continually from early September to late December. They are commonly seen at each lake with an average of 3,000 at Big Lake, 900 at Rice Lake and 100 at Goose Lake. Big Lake mallard densities exceeded ten thousand individuals during the 2005-2006 fall migration, with up to 37,300 individuals observed. Blue-winged and green-winged teals generally arrive in September and October through November, respectively. Blue-winged teals migrating through the Rice Lake Complex have been very scarce with a total of 55 individuals seen since 2006. Green-winged teals are more common and generally appear in numbers of greater than 100 individuals. Gadwalls arrive at Rice Lake and Big Lake from late October to November. Gadwalls have not been recorded on Goose Lake. Gadwalls migrate through Rice Lake SFWA almost every year with numbers ranging from 10 to 300 individuals. Northern pintails are among the first ducks to migrate south in the fall and north in the spring. They arrive at Rice Lake in early September or early November. Northern pintails are not common at Rice Lake Complex but occasionally are seen in numbers from 50 to 640 individuals. American black ducks arrive anytime from September through January, with no real pattern to when they will be at the Rice Lake SFWA. American black ducks have not been recorded using the Rice Lake SFWA as a stopover during migration since January 2006. When they have been recorded their numbers are usually low from 10-100 individuals, with one exception of 400 individuals seen in December 2005. Northern shovelers are occasionally seen at Rice Lake SFWA and arrive from September to November. Northern shovelers have not been observed at Rice Lake SFWA since September 2006. American wigeons do not frequent the Rice Lake Complex and have only been observed once at Goose Lake in October 2008 (figure 11).

The diving ducks that migrate through the Rice Lake Complex include ruddy ducks (*Oxyura jamaicensis*); common mergansers (*Mergus merganser americanus*); common goldeneyes (*Bucephala clangula americana*); ring-necked ducks (*Aythya collaris*); and buffleheads (*Bucephala albeola*) (figure 4). Redheads (*Aythya americana*); canvasbacks (*Aythya valisineria*); and lesser scaups (*Aythya affinis*) migrate through the Rice Lake Complex in the spring. Diving ducks also feed on vegetation similar to dabbling ducks such as pondweeds, sedges, grasses, smartweeds, coontail, algae and wild celery. A majority of diving ducks feed on animal matter such as aquatic insects and their larvae, mollusks, crustaceans, amphibians and fish. Diving ducks also feed in deeper water, further from shore as compared to dabbling ducks.

Ruddy ducks arrive almost annually in November at Rice Lake and Big Lake with numbers ranging from 25 to 1800 individuals. Common mergansers are not common to the Rice Lake Complex. They arrive at Rice Lake and Big Lake from late December to early January. Common mergansers have only been recorded three times at the Rice Lake with numbers of approximately two hundred

individuals. Common goldeneyes occasionally arrive at Big Lake in November and December. They have not been recorded in populations greater than 100 individuals. Ring-necked ducks arrive from late October to November. Ring-necked ducks were previously observed in groups of approximately 50, but last recorded observation on November 2, 2009 spotted 500 individuals. Buffleheads are not a common waterfowl species to the Rice Lake SFWA and have only recorded twice at Rice Lake in November 2005 (figure 12).

The geese that migrate through the Rice Lake Complex include Canada geese (*Branta canadensis*), white-fronted geese (*Anser albifrons*) and lesser snow geese (*Anser caerulescens caerulescens*). Other water birds that migrate by way of the Rice Lake Complex include American white pelicans and American coots (figure 13). Most of these geese feed on grasses and waste grains. The pelican's diet mainly consists of fish and coots are opportunistic feeders.

Canada geese arrive continually at all three lakes of the Rice Lake Complex from September to January. Numbers range from 5 to 4610 individuals with the most occurring on Big Lake, followed by Rice Lake and a few observed at Goose Lake. White-fronted geese have only been recorded three times and all at Big Lake. The numbers of individuals observed were 50 in November 2005, 500 in January 2006 and 600 in December 2008. Lesser snow geese are not common to the Rice Lake SFWA. They have been observed twice, both times at Big Lake, in September 2005 and December 2008 with 20 and 50 individuals, respectively. American white pelicans arrive September through November at the Rice Lake Complex, with the largest numbers appearing in September. Since 2008, pelicans have been more common at Rice Lake and Big Lake. American coots arrive at the Rice Lake Complex from September through November with the largest numbers occurring in November. The number of coots observed varies over a large range from 50 to 4200 individuals (figure 13).

C. Conclusions and Potential Post-Construction Outcomes. Rice Lake will see increased use by waterfowl, specifically dabbling ducks, when drawdowns expose mudflats. A three-month growing season is needed to allow enough time for emergent annual ("moist soil") vegetation to establish. Increasing the amount of aquatic vegetation that can be used as a food source for migrating waterfowl, and increasing the seasonal availability of this resource will benefit migratory waterfowl and potentially increase their occurrence within the Rice Lake SFWA.

Both diving and dabbling ducks would benefit from establishment of SAV. Without large stands of submerged aquatic vegetation, diving ducks will not be present in large numbers. Wind fetch is high, creating large waves that also increase turbidity. Submerged aquatic vegetation establishment is inhibited in the Rice Lake SFWA by flooding, Asian carp grazing, and wind fetch.

Comparing aerial surveys for waterfowl data for Rice Lake SFWA with data from Banner Marsh SFWA, Chautauqua NWR and Emiquon NWR would allow for better accuracy in determining success at Rice Lake. By comparing these four sites it is possible to determine if Rice Lake is seeing an increase or decrease in waterfowl against the other refuges. This would also prevent bias by examining the number of overall waterfowl that migrated through this stretch of the Lower Illinois River Valley for the season.

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RICE LAKE STATE FISH AND WILDLIFE AREA
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APPENDIX D
HABITAT EVALUATION AND QUANTIFICATION AND INCREMENTAL COST ANALYSIS

I. INTRODUCTION TO HABITAT EVALUATION

A habitat analysis was used to evaluate the potential benefits of alternative habitat rehabilitation and enhancement project (HREP) features at the Rice Lake State Fish and Wildlife Area (SFWA). Evaluated features and alternatives are described in detail in Section 4, *Potential Project Features.* Active participants included biologists from the U.S. Army Corps of Engineers (Corps), Rock Island District (District); the U.S. Fish and Wildlife Service (USFWS); Rock Island Ecological Service Office; and the Illinois Department of Natural Resources [(ILDNR) (formerly Department of Conservation)].

The need for quantification of HREP outputs as a project performance evaluation tool, a project ranking tool, and a project planning tool has been discussed by various agencies associated with the Upper Mississippi River System- Environmental Management Program. This application involves quantification solely for the purpose of project planning.

Quantification of project outputs (benefits) for the Rice Lake HREP is expressed in Habitat Units (HUs). Habitat units are a measure of habitat quality (habitat suitability indices (HSI)) and quantity (acres). Annualization of HUs can then be used to determine changes brought about by project features/alternatives over time. This annualization computes average annual habitat units (AAHUs). Once construction begins and as a project matures, habitat changes occur, and therefore habitat benefits may change. Many features, such as tree planting, would not begin to show benefits until well into the project life. The particular dynamics of the ecosystem under study then determine the target years chosen for analysis. With or without a project, habitat conditions change over time; therefore, the overall value of a proposed project depends upon the comparison of expected with-project benefits to expected without-project benefits.

II. HABITAT EVALUATION METHODOLOGY

The methodology used in this evaluation was the Wildlife Habitat Appraisal Guide (WHAG) (Urich, *et al.*, 1984). The WHAG was developed by the Missouri Department of Conservation and the U.S. Department of Agriculture, Soil Conservation Service. It is a field evaluation procedure designed to estimate habitat quality and account for changes due to land management practices. Checklist-type appraisal guides are used for upland, wetland, and aquatic habitats, and computer programs are used to analyze field data in terms of habitat suitability for various wildlife species. This analysis employed a multi-agency team approach with representatives from the District, the USFWS, the ILDNR, and the Illinois Natural History Survey.

The WHAG analysis is a numerical system for evaluating the quality and quantity of particular habitats for species selected by WHAG team members. The qualitative component of the analysis is known as the habitat suitability index (HSI) and is rated on a 0.1 (unsuitable) to 1.0 (optimal) scale. The suitability of a given habitat type for a set of evaluation species is determined by the qualitative characteristics of the habitat type. The WHAG procedures include the use of limiting factors, which is a habitat requirement for an individual species during a critical time of year. Absence of that habitat characteristic makes the habitat unsuitable and results in the lowest HSI value of 0.1. Habitat quality values can be improved by: 1) increasing the quantity of habitat types that may be limited or lacking in the study area; 2) altering a limiting factor, such as excessive current velocity; 3) altering a management strategy, such as cropping practices or water level manipulation; or 4) a combination of the preceding, depending on management goals, target species requirements, or available funds.

The quantitative component of the WHAG analysis is the measure of acres of habitat that are available for the selected species. From the qualitative and quantitative determinations, the standard unit of measure, the habitat unit (HU), is calculated using the formula (HSI x Acres = HUs). For project planning and impact analysis, project life was established as 50 years. To facilitate comparison of project alternatives, target years were established at 0 (existing conditions), 1, 25, and 50 years. HSIs and average annual habitat units (AAHUs) for each evaluation species were calculated to reflect expected habitat conditions over the life of the project.

Prior to field evaluation, the study team reviewed aerial photography, topographic maps, and preliminary design drawings. During field evaluation, assumptions were developed regarding existing conditions and projected post-project conditions relative to limiting factors and management practices.

III. EVALUATION SPECIES SELECTION

Table D-1 lists the 23 fish and wildlife species used in this analysis. These are part of an established set used in the habitat matrices of the WHAG model. Although a set list of species has been used, each individual represents a guild of other similar species that utilize the habitat in similar ways. In essence, each species reflects an array of habitat variables for the species being evaluated. The habitat requirements for the evaluated species also reflect the ecosystem goals and objectives, as listed in Section 3, *Project Objectives,* established for the Rice Lake SFWA HREP.

Appendix D
Habitat Evaluation and Quantification

Table D-1. Evaluation Species Selected for Habitat Analysis

Species	Scientific Name	Habitat Evaluated
Channel catfish	*Ictalurus punctatus*	aquatic
Crappie	*Poxomis sp.*	aquatic
Largemouth bass	*Micropterus salmoides*	aquatic
Gizzard shad	*Dorosoma cepedianum*	aquatic
Carp	*Cyprinus carpio*	aquatic
Bluegill	*Lepomis macrochirus*	aquatic
Black bullhead	*Ictalurus melas*	aquatic
Mallard	*Anas platyrhynchos*	nonforest wetland/cropland
Canada goose	*Branta canadensis*	nonforest wetland/cropland
Least bittern	*Ixobrychus exilis*	nonforested wetland
Lesser yellowlegs	*Tringa flavipes*	nonforested wetland
Muskrat	*Ondatra zibethicus*	nonforested wetland
King rail	*Rallus elegans*	nonforested wetland
Green-backed heron	*Butorides striatus*	nonforested wetland
White-tailed deer	*Odocoileus virginianus*	crop/grass/BLH forest
Wild turkey	*Meleagris gallopavo*	wet-mesic grass/BLH forest
Fox squirrel	*Sciurus niger*	BLH forest
Wood thrush	*Hylocichla mustelina*	BLH forest
Kentucky warbler	*Oporornis formosus*	BLH forest
Eastern bluebird	*Sialia sialis*	wet-mesic grass/BLH forest
Bobwhite quail	*Colinus virginianus*	crop/grass/BLH forest
Eastern cottontail	*Sylvilagus floridanus*	wet-mesic grass/BLH forest
Indigo bunting	*Passerina cyanea*	BLH forest

Seven species were selected to evaluate the effect of proposed water control and water level management features on nonforested wetland habitat: Mallard and Canada goose are migratory waterfowl that utilize early successional, seasonal wetland habitat, including wet cropfields, and have socioeconomic importance as game species. The green-backed heron is a wading bird species found in midsuccessional herbaceous and shrub-dominated wetland habitat. The least bittern is a state listed endangered/threatened species that favors permanent, midsuccessional nonforested wetland habitat. Lesser yellowlegs is a migratory shorebird that favors initial successional, seasonal wetland habitat (e.g. mudflats, waterlogged substrates). The king rail is a migratory water bird that utilizes midsuccessional, sedge dominated, permanent wetland habitat. The muskrat is a resident furbearing mammal found in midsuccessional herbaceous, permanent wetland habitat. These species were selected to represent a much wider range of wildlife species, migratory and resident, game and nongame, common and rare that utilize nonforested wetlands.

Seven species were selected to evaluate the effects of the proposed fish passage feature on the quality of the backwater aquatic habitat: channel catfish, crappie, largemouth bass, gizzard shad, carp, bluegill, and black bullhead. This group represents a wider range of sport, commercial, and forage species commonly found in the project area, and all of which utilize backwaters during part of their life cycle. A total of nine species were selected to evaluate both positive and negative effects of conversion of the existing cropfield habitat to wet meadow and/or forest habitat. Species selected for

evaluation represent a wider range of species, including those which utilize only one of the habitat types (e.g. bottomland hardwood forest) potentially impacted by the project as well as several which use more than one habitat type. Mallard and Canada goose can utilize cropfield habitats as feeding areas (Note: These two species were also used to evaluate nonforested wetland habitat for the water control/management features). White-tailed deer and wild turkey are game species that favor a diversity of habitats. The eastern bluebird and the indigo bunting utilize grassland/forest edge habitat. The fox squirrel favors mature forest habitat with snag and cavity trees as well as mast producing tree species. Wood thrush and Kentucky warbler are species found in mature bottomland forest habitats. The bobwhite quail and eastern cottontail are game species that favor early successional habitats with an abundance of openland edge.

IV. HABITAT EVALUATION ASSUMPTIONS

Several assumptions have been made in regards to model performance, changes in habitat conditions over time, future management use, habitat use, management reliability, design of fish passage structures, and Duck Island plantings.

A. Model Performance. The WHAG methodology has been designed to be applied to many different types of habitat. To evaluate the habitat effects of the proposed features for improved water control and water level management, the nonforested wetland habitat matrix was used. An aquatic matrix for backwater habitat (MOFISH) was used to evaluate changes in aquatic habitat quality resulting from proposed fish passage structures. Cropfield, wet meadow/grassland, and bottomland forest habitat types were evaluated to quantify habitat changes related to conversion of agricultural fields on Duck Island to native floodplain plant cover types.

B. Changes in Habitat Conditions Over Time. Habitat conditions are not static. Either through natural processes or human activity, habitat evolves and may change in quality and/or quantity. Imbedded in each habitat type evaluation, change has been added to the model. To assess the change over the period of analysis, target years have been defined. At each target year, a change in the habitat variables may be noticed. Noticeable changes can be characterized by a change in habitat benefit output. Target years of 0, 1, 25, and 50 were considered sufficient to analyze HUs and characterize habitat changes resulting from proposed features over the estimated project life.

For planning purposes, future conditions without implementation of the project were assumed to be similar to baseline conditions. Land cover in the future would be similar to current conditions. Habitat quality would be equal to or less than what currently exists in the project area. Rice Lake would be actively managed by the ILDNR for waterfowl food production and use, but Big Lake and associated shallow water areas would continue to be subject to Illinois River fluctuations during the growing season and interior water levels could not be managed in this portion of the SFWA. Rice Lake would continue to be isolated from deepwater areas when Illinois River levels drop below the top elevation of the Narrows Dam. The Duck Island fields would continue to be cultivated for agricultural production.

Future river stage seasonal patterns of fluctuation and recurrence of moderate to severe flooding were assumed to be similar to river stage fluctuations recorded over the past 50+ years. Assumptions concerning the influence of river stages on the effectiveness of alternative spillway and pump station designs are discussed in Section IV. E. In most cases, future without-project conditions were assumed to be similar, though not identical, to baseline conditions (no significant future degradation or loss of habitat).

The potential for restoration of historically diverse native floodplain forest on Duck Island through passive means (cessation of cultivation followed by natural regeneration) was assumed to be severely limited to nonexistent due to altered hydrology of the Illinois River over the last 70+ years combined with depletion of natural seed banks.

C. Future Management Use. The analysis assumed that there would be minor capital improvements made at Rice Lake that would have some effect on wildlife and human use. One assumption was that the integrity of existing water control structures would remain essentially the same over the 50-year project life. Another assumption was that current operating plans would remain in effect during that time, and that the current management objectives would remain in effect.

D. Habitat Use. The proposed project would affect all the principal water bodies of the Rice Lake SFWA, as well as the agricultural fields on the Duck Island peninsula. While most evaluated species are selected to identify changes to just one habitat type, the nonforested wetland/shallow aquatic habitat in the project area is evaluated both as wetland that provides habitat to birds and mammals, and as backwater/overflow lakes that provide habitat for fish of the Illinois River ecosystem. The plantings feature was evaluated for species associated with floodplain habitat types (wet meadow/grassland, forest) as well as wet cropfield habitat.

Anticipated impacts to floodplain forest resulting from construction of the perimeter spillway, pump station, and interior channels are addressed in the integrated Environmental Assessment and Biological Assessment. Floodplain forest is one of the major habitat types currently found in the Rice Lake SFWA (approximately 2,000 acres) and conservation of this habitat is one of the planning constraints for the site. However, the mast tree planting feature proposed to restore lost structure and function to this habitat type within the SFWA is located on land currently cultivated for agricultural purposes, rather than within existing floodplain forest stands. For this reason, existing floodplain forest habitat in the Rice Lake SFWA was not evaluated in the WHAG analysis.

Construction of proposed water level management features would require the permanent clearing of approximately 4.8 acres of bottomland hardwoods, mostly along the spillway alignment and conveyance channel rights-of-way. The proposed conversion of a portion of Duck Island to floodplain forest cover that includes mast-producing tree species would be expected to contribute to the overall quality and diversity of forest habitat in the project area, and should also result in a net increase in the overall quantity of this habitat type long term. Operation of water control features is not expected to adversely affect floodplain forest. Proposed normal pool elevations for both lakes (437.0 for Rice Lake and 436.0 for Big Lake) approximate the existing tree line and increased flooding of wooded areas is not anticipated. The ability to draw down the lakes during the majority of the

growing season, and the increased protection from minor summertime flooding, could potentially result in slightly improved conditions for floodplain survival and growth. The low level of protection provided by the perimeter spillway would not protect existing floodplain forest from the negative effects of major floods that may occur during the growing season.

E. Management Reliability (Probability of Successful Operation) for Perimeter Water Control and Water Level Management Features. Alternative combinations of features to incrementally increase water control and water level management capability (perimeter spillway and additional pumping/distribution facilities) were difficult to incrementalize through the WHAG analysis. The suitability variables addressed in the WHAG matrix for nonforested wetland are not sensitive enough to measure the differences in habitat outputs between the incremental levels of management capability evaluated for this project. For this reason, the "future with-project condition" developed through the WHAG analysis reflects the projected outputs of the combination of spillway elevation and pumping capacity which provided the highest level of output measured in total AAHUs (see Section VII). In order to account for the outputs of alternative (lower) water control capability, it was necessary to develop a method of quantifying the benefits of alternative combinations expected to provide lower levels of output than the evaluated combination.

Successful water level management is dependent on the ability to manipulate interior water levels independent of river stage. The higher the level of protection, and the greater the capacity to manipulate interior water levels independent of Illinois River levels, the greater the probability of successful operation and the greater the reliability of meeting habitat needs of wetland species to achieve management objectives. The 1991 water control study conducted for the ILDNR by Crawford, Murphy and Tilly analyzed 41 years of river stage data (1950 to 1990) to evaluate the probability (success rate) of meeting operational objectives for the site with different levels of water control capability. Analysis of river stage data by Corps staff further refined the expected performance of spillway and pump alternatives based on more recent historic records (1960 to 2000) and the size of the total area affected by each alternative. The lower increments of spillway and pumping primarily affect Big Lake only, while the higher increments affect both Big Lake and Rice Lake.

The results of the Corps' analyses of historic river stage data were used to derive a multiplier factor reflecting relative reliability in meeting operational objectives for comparison of each combination of spillway (L) and pumping (P) alternative features. The multipliers applied to each L+P combination are as follows:

Combination	**Multiplier** [1]
L1+P2	1.00
L1+P1	0.63
L1+P0	0.36

[1] % success relative to the maximum with-project condition evaluated

L1 - Big Lake perimeter spillway with 440' top elevation
P0 - No new pump station
P1 - New pump station for Big Lake and adjacent interior management units only
P2 - New pump station for Big Lake, Rice Lake and all interior management units

The multiplier for L1+P0 derives from the estimated "with-project" success rate for achieving and sustaining a growing season drawdown given in Section VI.B of Appendix G (0.35 percent, or 17 of 49 years). For purposes of the WHAG analysis, the multiplier was increased to 0.36 to account for a very minor anticipated benefit to Rice Lake and associated waterbodies, resulting from construction of the L1 perimeter levee at elevation 440.0, or one foot higher than the elevation of the Narrows Dam at elevation 439.0.

The multiplier for L1+P1 (0.63) reflects the relative size of the area projected to experience an incremental increase in net benefits under the FWP condition. This alternative is expected to affect only Big Lake and associated waterbodies, which comprise approximately 63 percent of the total nonforest wetland/shallow aquatic habitat potentially affected by the perimeter water control and water level management features (Rice Lake and associated waterbodies account for the remaining 37 percent). The L1P2 alternative provides net benefits to the entire habitat acreage (Big Lake et al + Rice Lake et al) affected under the FWP condition and for this reason the multiplier for this alternative is 1.0.

It is important to note that the multiplier values are keyed to the maximum "with-project" condition estimated through the WHAG analysis, and do not represent the expected absolute rate of success in following the management plan. For example, the L1+P2 combination is not expected to result in achievement of summer drawdown 100 percent of the time through the project life. The actual rate of drawdown success (assuming future river stage fluctuations would reflect recent historic hydrologic profiles) anticipated for the highest degree of water control and water level management evaluated for this project is approximately 39 percent, or about 4 out of every 10 years (compared with less than 10 percent or one out of 10 years expected for baseline and future without-project conditions). This assumption was reflected in the WHAG analysis of the with-project condition. It is also important to note that the highest level of water control evaluated for this project still affords only a very low level of flood protection relative to many neighboring areas in the floodplain, including the Spring Lake Levee and Drainage District and the Banner Marsh SFWA.

F. Design of Fish Passage Structures. The evaluation of aquatic habitat using the aquatic (MOFISH) Overflow Waters matrix assumed that the fish passage structure F1 would facilitate fish movement from Rice Lake into deepwater areas of the Duck Island gravel pit, and that the addition of a passage structure between Goose Lake and the Illinois River would benefit fisheries over the entire complex by helping to maintain connectivity of the backwater complex with the Illinois River. Both alternatives assume that the existing connection between Big Lake, Beebe Lake, Goose Lake, and the Duck Island gravel pit remains open and functioning through the life of the project, and that movement of fish between Goose Lake and the Illinois River is minimal during the low river stages that frequently occur during summer months.

G. Duck Island Plantings. The conversion of cropfield acreage on Duck Island to native plant cover types involves more extensive physical alteration to the existing project area land cover than would be expected for either the wetland or aquatic features. Consequently, the WHAG analysis accounted for the value of cropfield, wet meadow/grassland, and forest habitats to certain wildlife species under baseline and future without-project conditions to address the anticipated "trade-offs"

between habitat values for the full range of species evaluated for this feature. The analysis also assumed differing rates of maturity for the two native cover types (wet meadow/grassland and bottomland hardwood forest) evaluated for the project.

V. RESULTS OF HABITAT EVALUATION

This Section describes the HSI scores and benefits in net AAHUs for each feature discussed in the main report. These features are: development of a perimeter water control spillway (L); improved water level management capability through constructing a new pump station and associated distribution channels (P); constructing fish passage structures (F); and planting native vegetation on Duck Island (T). In each feature discussion, the no action, or without-project condition is also discussed.

A. Water Control/Management Alternatives. The final WHAG analysis evaluated one alternative perimeter spillway design and two pump station alternatives. Spillway alternative 1 (L1) would involve constructing a perimeter spillway around Big Lake with a top elevation of 440.0. Pump station alternative 1 (P1) would involve constructing a new pump station and conveyance channels to provide water for Big Lake and adjacent management units with continued operation of the existing Rice Lake pump station. Pump station alternative 2 (P2) would construct the new pump station and conveyance channels to the entire Big Lake-Rice Lake backwater complex and replace the existing Rice Lake pump station. These alternatives are described in greater detail in the Main Report, Section 5, *Evaluation of Feasible Project Features and Formulation of Alternatives.*

Results of the analysis indicated that under baseline and expected future without-project conditions the nonforested wetlands of the Rice Lake SFWA provide habitat suitable for species that utilize either seasonal mud flats (lesser yellowlegs) or permanent midsuccessional wetlands dominated by perennial vegetation such as cattail and bulrush (bittern, muskrat, heron). However, unseasonal river stage fluctuations limit the capability of the project area to provide reliable seasonal or permanent wetland habitat dominated by annual vegetation such as sedge and wild millet. This in turn limits the area's suitability as habitat for migratory and resident species such as mallard, Canada goose, and king rail. Under the expected future with-project condition (perimeter spillway, new pump station, and associated water control structures), restoration of historic seasonal water level cycles within the project area is expected to increase the availability and/or quality of habitat for all evaluated wildlife species, as displayed in table D-2.

Table D-2. Habitat Suitability Index (HSI) Values for Water Control/Management Alternatives

	HSI VALUES						
Species	**TY 0 Base**	**TY1 No Action**	**TY25 No Action**	**TY50 No Action**	**TY 1 w/Project**	**TY 25 w/Project**	**TY 50 w/Project**
Mallard	0.1	0.1	0.1	0.1	0.54	0.54	0.54
Canada Goose	0.1	0.1	0.1	0.1	0.66	0.66	0.66
Least Bittern	0.71	0.71	0.69	0.69	0.71	0.76	0.76
Lesser Yellowlegs	0.59	0.59	0.59	0.59	0.68	0.68	0.68
Muskrat	0.29	0.29	0.28	0.28	0.33	0.33	0.33
King Rail	0.1	0.1	0.1	0.1	0.67	0.67	0.67
Green-backed Heron	0.69	0.69	0.75	0.75	0.78	0.78	0.78

Note: In the WHAG methodology, an HSI value of 0.1 or less indicates unsuitable habitat.
TY=target year

As shown in table D-3, evaluation of net AAHUs for alternative combinations of water level control (perimeter spillway) and water management capability (pump station) reflected the comparative degree of reliability and capability associated with each combination, as discussed in Section IV, paragraph E. All of the alternative combinations resulted in net positive effects to all evaluated species, with king rail, Canada goose and mallard expected to experience the greatest increases in habitat value. This result indicates that operation of the proposed features to mimic the historic seasonal pattern of river stage fluctuation should enhance the habitat function of the project area for a wide range of migratory and resident wetland species.

Table D-3. Water Control/Management – Estimated Net Habitat Benefits (AAHUs) [1]

Species	**No Action**	**(36%)[1] L1P0**	**(63%)[1] L1P1**	**(100%) L1P2**
Mallard	0	592	1036	1645
Canada Goose	0	723	1266	2009
Least Bittern	0	58	101	161
Lesser Yellowlegs	0	96	168	267
Muskrat	0	50	87	138
King Rail	0	732	1281	2033
Green-backed Heron	0	42	73	116
SUM NET AAHU[1]	**0**	**2293**	**4012**	**6369**

[1] Effectiveness Multiplier

B. Fish Passage Structures. This feature involves constructing structures to allow fish access to deeper water, increasing opportunities for survival during summer drawdown periods within the project area. Table D-4 displays the HSI values computed for baseline, future without-project (No Action), and future with-project conditions. The results of the WHAG analysis showed positive effects to all evaluated fish species. Carp, black bullhead, gizzard shad, and channel catfish showed the greatest increase in habitat suitability under the with-project condition, while crappie, largemouth bass, and bluegill showed only slight increases in suitability. This result reflects the assumption that

the primary effect of the proposed features will be to increase access to deep water areas without affecting other aquatic habitat characteristics within or outside the SFWA.

Although not addressed through the WHAG analysis, providing refugia for fish in the Duck Island quarry pit could potentially provide some secondary benefit to waterfowl. Decomposing fish can serve as a host for maggots producing the toxin that causes avian botulism. Improving fisheries habitat is expected to decrease the likelihood of fish kills, which in turn could potentially reduce the probability of future outbreaks of avian botulism.
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Table D-4. Habitat Suitability Index (HSI) Values for Fish Passage Alternatives

Species	TY 0 Base	TY1 No Action	TY25 No Action	TY50 No Action	TY 1 w/Project	TY 25 w/Project	TY 50 w/Project
Channel Catfish	0.1	0.1	0.1	0.1	0.28	0.30	0.30
Crappie	0.1	0.1	0.1	0.1	0.1	0.14	0.14
Largemouth Bass	0.1	0.1	0.1	0.1	0.1	0.15	0.15
Gizzard Shad	0.1	0.1	0.1	0.1	0.35	0.35	0.35
Carp	0.1	0.1	0.1	0.1	0.38	0.38	0.38
Bluegill	0.1	0.1	0.1	0.1	0.1	0.16	0.16
Black Bullhead	0.1	0.1	0.1	0.1	0.38	0.38	0.38

Note: In the WHAG methodology, an HSI value of 0.1 or less indicates unsuitable habitat.
TY=target year

Table D-5 displays the net benefits in AAHUs computed for two fish passage alternatives. Both alternatives are expected to result in net benefits to all evaluated species. The first alternative (F1) involves construction of a single structure to provide fish access between Rice Lake and the Duck Island gravel pit. The second alternative (F2) would involve construction of a second structure to allow fish passage from Goose Lake to the Illinois River, in addition to the Rice Lake-gravel pit structure.

Table D-5. Fish Passage Alternatives – Estimated Net Habitat Benefits (AAHUs)

Species	No Action	F1 Rice Lake 1134 acres	F2 Rice Lake + Big Lake 3054 acres
Channel Catfish	0	375	886
Crappie	0	170	401
Largemouth Bass	0	177	418
Gizzard Shad	0	449	1061
Carp	0	485	1145
Bluegill	0	182	430
Black Bullhead	0	491	1159
SUM NET AAHU	**0**	**2329**	**5501**

C. Duck Island Planting Alternatives. This feature involves restoration of floodplain habitat by converting 409 acres of cropfield on Duck Island to native vegetative cover through active planting. The ILDNR's specific management objective for Duck Island is to maximize restoration of floodplain forest cover to enhance landscape level benefits for forest-dwelling animal species. However, a portion of the cropfield (57 acres minimum) will be planted in native herbaceous species. This is necessary to ensure that tree planting activities do not adversely affect four archeological sites located on Duck Island that are potentially eligible for inclusion on the National Register of Historic Places.

Table D-6 displays the HSI values computed for existing (cropfield) and proposed (wet meadow/grassland, forest) plant cover types for Duck Island for target years 1, 25, and 50.

Table D-6. Habitat Suitability Index (HSI) Values for Duck Island Planting Alternatives

Species	TY 50 Crop	TY 0 Grass 1	TY1 Grass 25	TY25 Grass 50	TY50 Forest 1	TY 1 Forest 25	TY 25 Forest 50
White-tailed Deer	0.64	0.71	0.71	0.71	0.67	0.67	0.67
Wild Turkey	0	0.75	0.75	0.75	0.24	0.24	0.25
Fox Squirrel	0	0	0	0	0	0.55	0.55
Wood Thrush	0	0	0	0	0	0.36	0.36
Kentucky Warbler	0	0	0	0	0	0	0.52
Eastern Bluebird	0	0.72	0.72	0.72	0.78	0.62	0
Bobwhite Quail	0.11	0.51	0.51	0.51	0.27	0.20	0.16
Eastern Cottontail	0	0.43	0.43	0.43	0.29	0.19	0.15
Indigo Bunting	0	0	0	0	0	0.68	0
Mallard	0.37	0	0	0	0	0	0
Canada goose	0.54	0	0	0	0	0	0

Crop (No Action)
Grass (Native Wet Meadow/Grassland)
Forest (Bottomland Forest)
Note: In the WHAG methodology, an HSI value of 0.1 or less indicates unsuitable habitat.

Analysis of cropfield habitat produced baseline values for four species (deer, quail, mallard, and goose). Conversion of the cropfield habitat on Duck Island to native wet meadow and/or forest cover is expected to result in a slight reduction in suitability for deer and a total loss of suitability (within the converted cropfield) for mallard and goose. The establishment of wet meadow/grassland habitat is expected to produce conditions suitable for turkey, bluebird, and cottontail. Establishment of native hardwood forest with mast-producing trees should provide conditions suitable for squirrel, thrush, warbler, and bunting, though the suitability for the different species changes as the forest habitat changes and matures over the 50-year project life.

Table D-7 lists net benefits computed for several alternative combinations of native cover type restoration on Duck Island. Alternatives T1 (352 acres wet meadow/grassland) and T5 (352 acres forest) involve conversion of the 409-acre Duck Island cropfield to a single cover type. Alternatives T2, T3 and T4 involve converting the cropfield to various combinations of wet meadow/grassland and forest. Because of differences in their individual habitat requirements, the wildlife species evaluated for this feature respond differently to the alternatives. While alternative T5 has the highest total

benefits, this alternative does not fully meet the ILDNR's management objective to restore large contiguous tracts of native forest cover to the Illinois River floodplain.

Table D-7. Duck Island Planting Alternatives – Estimated Net Habitat Benefits (AAHUs)

Species	No Action (crop)	T1 352 grass 57 trees	T2 272 grass 137 trees	T3 204 grass 205 trees	T4 137 grass 272 trees	T5 57 grass 352 trees
White-tailed Deer	0	26	23	21	18	15
Wild Turkey	0	274	234	200	166	126
Fox Squirrel	0	25	60	90	119	155
Wood Thrush	0	19	47	70	93	120
Kentucky Warbler	0	12	28	42	55	72
Eastern Bluebird	0	280	265	252	239	224
Bobwhite Quail	0	144	120	100	80	56
Eastern Cottontail	0	161	143	128	113	95
Indigo Bunting	0	22	52	78	104	135
Mallard	0	-150	-150	-150	-150	-150
Canada Goose	0	-219	-219	-219	-219	-219
SUM NET AAHU	**0**	**594**	**604**	**611**	**619**	**629**

VI. DISCUSSION

The results of the habitat analysis support the premise that the functions and values of the Rice Lake floodplain-wetland complex can be enhanced with the features proposed for this project. The WHAG analysis indicates that improved water level control and water management capability, conversion of Duck Island cropfields to native hard mast producing forest and wet meadow/grassland through active planting, and the fish passage culverts, would provide a high level of quantified project outputs (net ecosystem benefits), with no unacceptable trade-offs in habitat values for any evaluated species. This combination of features would allow the ILDNR site manager optimal management flexibility conditioned on the level of flood protection provided by the perimeter spillway, which would add to habitat diversity as well as quality, and would best meet the overall ecosystem restoration objectives for the site.

VII. COST EFFECTIVENESS AND INCREMENTAL ANALYSIS OF ALTERNATIVES

Comparison of alternative feature designs and combinations of features is accomplished through cost-effectiveness evaluation and incremental cost analysis. Cost-effectiveness evaluation is used to identify the least costly solution to achieve a range of project benefits. Incremental cost analysis is a tool that can assist in making decisions on the scale or size of the project or of individual features by determining changes in costs associated with increasing levels of benefits.

A. Enhancement Features. The proposed project for Rice Lake involves four primary enhancement features: perimeter water control spillway; improved water level management capability (pump station and distribution channels); construction of fish access structures; and planting native vegetation on Duck Island cropfields. As explained in the text of the main report, establishment of the perimeter water control spillway is an essential starting point for implementation of these features. Thus, the incremental cost analysis evaluated the perimeter water control spillway (two alternative heights) by itself and in combination with the two water control options — two planting options, and the fish access structures.

1. Perimeter Water Control Spillway (L). The successful management of the Rice Lake SFWA for migratory birds is dependent on the reliable production of seasonal annual vegetation. The key to achieving this objective lies in the ability to accomplish a late spring drawdown to expose mudflats and promote the growth of annual vegetation that is protected from flooding until after the growing season, coupled with the capacity to reflood the area during fall migration and manipulate water levels as needed to meet management goals (e.g. mudflats for shorebirds vs. $\leq$2-foot water depths for ducks). The addition of a perimeter water control spillway to the project area is essential to achieve any degree of improved wetland management. This feature includes a spillway structure and a gravity flow outlet for water level control and to protect the structure from flood damage.

Quality of existing wetland habitat would be raised by improving the ability to promote food plant production and provide feeding areas for waterfowl during migration periods. The results of the WHAG analysis show positive impacts for all evaluated species, particularly those which utilize moist soil vegetation as a food source (mallard and Canada goose) or require stable water levels (king rail).

Spillway at Elevation 440.0 (L1). The earth segment of the perimeter water control spillway would be constructed with a minimum top elevation of 440.0 (part of the northern portion of the alignment exceeds this elevation). This alternative would protect the Big Lake area from minor fluctuations in Illinois River levels up to elevation 440.0 during the summer drawdown. Drawdown and reflooding of the Big Lake area would be accomplished by gravity flow and would be dependent on favorable river stage conditions.

2. Improved Water Level Management Capability (P). As discussed in Section IV. E, the probability of achieving the operational goals of the project is dependent not only on the ability to maintain desired water levels in Big Lake and Rice Lake, but also on the ability to manipulate those water levels independent of Illinois River stages. Additional pumping capacity and associated distribution channels (drainage ditches) would provide the management flexibility needed to reliably achieve project goals and objectives. Additional pumping and distribution capacity would provide greater management flexibility for the entire project area, and would further improve habitat quality by increasing the success rate for the operational plan.

a. New Pump Station and Distribution System for Big Lake Only (P1). This alternative would involve construction of a new pumping station with a capacity of 50,000 gpm on the Illinois River near the old Copperas Creek lock, and excavation of distribution channels to move water between the river and Big Lake. The newly constructed facilities would provide the capability to

reflood the Big Lake area to achieve desired water levels. The existing pump station would continue to be operated and maintained to manage water levels in the Rice Lake area.

b. New Pump Station and Distribution System for Big Lake and Rice Lake (P2). This alternative would involve construction of a new pumping station with a capacity of 133,200 gpm on the Illinois River near the old Copperas Creek lock, and excavation of distribution channels to move water between the river, Big Lake, and Rice Lake. The newly constructed facilities would provide the capability to reflood both the Big Lake area and the Rice Lake area, in order to achieve desired water levels. The existing pump station would no longer be operated and maintained to manage water levels in the Rice Lake area.

3. Fish Access Structures (F). Restoration and protection of habitat for fish in the backwater aquatic areas of the Rice Lake SFWA involves reducing the potential for fish mortality due to seasonal fluctuations in water levels (primarily midsummer drawdowns), and by maintaining or, if possible, enhancing seasonal connectivity with the Illinois River. The access structures would allow movement of fish from shallow water to areas with greater water depth (Duck Island gravel pit and the Illinois River) during spring and summer drawdown periods within the SFWA.

a. No Action (F0). No action would result in no increase in fish access between Rice Lake and the deepwater areas of the Duck Island gravel pit, and no increase in fish access between Big Lake and the Illinois River.

b. Rice Lake-Gravel Pit Access (F1). This alternative would involve constructing a single structure to allow fish access between Rice Lake and the Duck Island gravel pit. Because a connection between Big Lake and the gravel pit already exists, this alternative would affect only Rice Lake. Access between the entire SFWA and the Illinois River would be unaffected.

c. Rice Lake-Gravel Pit Access plus Goose Lake-Illinois River Access (F2). This alternative would involve constructing the Rice Lake-gravel pit access described above and also constructing a second structure between Goose Lake and the Illinois River that would function both as a gravity drain and fish access for the entire SFWA during the summer drawdown.

4. Duck Island Native Vegetation Plantings (T). This feature would convert the 409 acres of cropfield habitat on the Duck Island peninsula to native vegetation to provide habitat for a diversity of wildlife species. Although Duck Island lies entirely within the 500-year floodplain, most of the peninsula is considerably higher in elevation than the surrounding wetlands of the Rice Lake SFWA. The higher topography of Duck Island provides conditions suitable for the reintroduction of native floodplain hardwoods, particularly mast producing species, and herbaceous plant species less tolerant of frequent flooding than those which are currently common in the project area.

a. No Action (T0). No action would result in no change in existing land cover or land use practices on Duck Island. Agricultural activities would be assumed to continue as currently practiced.

b. Conversion of Cropfields to Native Forest and Wet Meadow/Grassland Cover (T1-T5). These alternatives involve conversion of Duck Island cropfields to native forest and wet meadow/grassland cover through active planting of native vegetation, in varying proportions, as follows:

(T1) - 352 acres wet meadow/grassland, 57 acres forest
(T2) - 272 acres wet meadow/grassland, 137 acres forest
(T3) - 204 acres wet meadow/grassland, 205 acres forest
(T4) - 137 acres wet meadow/grassland, 272 acres forest
(T5) - 57 acres wet meadow/grassland, 352 acres forest

The primary difference between these alternatives would be the proportional availability of habitat for forest-dwelling versus wet meadow/grassland-dwelling species.

B. Cost Estimates for Habitat Improvement Measures. Table D-8 shows the estimated outputs (in AAHUs) and annualized costs for each feature alternative. A detailed breakdown of costs for the recommended plan is outlined in Appendix J, *Cost Estimate*. Costs were annualized and are based on estimates for construction, real estate, monitoring, and OMRR&R.

Table D-8. Environmental Output and Costs of Each Feature

Feature	Symbol	Output [1]	Annualized Cost [2]
Perimeter Spillway			
No action	L0	0	0
Spillway 440, no pump	L1+P0	2293	$124,000
Spillway 440, Big Lake pump only	L1+P1	3949	$369,000[3]
Spillway 440, Big/Rice Lake pump	L1+P2	6369	$425,000
Fish Access Structures			
No Action	F0	0	0
Passage from Rice Lake to Duck Island quarry pit	F1	2329	$14,000
Passage from Rice Lake to Duck Island quarry pit and from Big Lake to IL River	F2	5501	$24,000
Duck Island Native Vegetation Planting			
No action	T0	0	0
352 acres wet meadow/grassland, 57 acres forest	T1	594	$47,000
272 acres wet meadow/grassland, 137 acres forest	T2	604	$51,000
204 acres wet meadow/grassland, 205 acres forest	T3	611	$54,000
137 acres wet meadow/grassland, 272 acres forest	T4	619	$56,000
57 acres wet meadow/grassland, 352 acres forest	T5	629	$60,000

[1] Outputs are calculated as AAHUs.
[2] Annualized cost includes initial construction, real estate, monitoring, and OMRR&R costs based on a 50-year project life, 4⅜% interest rate.
[3] For this feature (L1+P1), annualized costs are not included for OMRR&R of the existing pump station as they are a part of the ILDNR's existing responsibilities.

C. Incremental Analysis of Project Alternatives. Cost effectiveness and incremental cost analysis (CE/ICA) was used to assist the process of determining what project features and design alternatives should be built based on comparison of quantified habitat benefits (outputs) and estimated costs of alternative feature designs. This process identifies alternative features or combinations of features that partially or fully meet the goals and objectives of the project and at the same time are the most cost effective. A cost effectiveness analysis is conducted to ensure that least cost alternatives are identified for various levels of output. After the cost effectiveness of the alternatives has been established, subsequent incremental cost analysis is conducted to reveal and evaluate changes in cost for increasing levels of environmental output.

CE/ICA is basically a three-step procedure: 1) calculate the environmental outputs of each feature; 2) determine a cost estimate for each feature; and 3) combine the features to evaluate the best overall project alternative based on habitat benefits and cost. Costs were annualized by applying a 4⅜ percent interest rate to the construction cost over the life of the project, estimated at 50 years for planning purposes. The incremental analysis of alternatives was accomplished following guidance prepared by the Corps' Institute for Water Resources and using the methodology described in Robinson, *et al*.

Primary assumptions and constraints used in conducting CE/ICA for this HREP are as follows:

- AAHUs for all included fish and wildlife species were accorded equal weight in comparing benefits of alternative plans. Alternatives analysis was limited to combinations that at least partially met all three project objectives listed in table 3.1 in the Main Report**.**
- Feature P (pump station) was assumed to be dependent on Feature L (perimeter spillway).

Because both the perimeter spillway and pump station address the project objective of restoring and protecting wetland habitat, combinations of alternatives that included P0 (no new pumping capacity) were included in the CE/ICA analysis provided they also met the conditions of assumption 2.

A total of 72 plans were evaluated. Of these, 24 plans (including the No-Action alternative L0+P0+F0+T0) were identified as being cost-effective using CE/ICA analysis. These plans are listed in table D-9 and displayed in figure D-1.

Incremental cost analysis identified six of the above plans as "Best Buy" plans, defined as those cost-effective plans which provide the greatest incremental increase in output (benefits) for the lowest incremental increase in cost. These "Best Buy" plans are listed in table D-10 and displayed in figure D-2.

Table D-9. Cost-Effective Alternative Combinations

Plan Alternative	Annualized Cost ($)	Outputs (AAHU)	Average Cost ($/AAHU)
L0P0F1T0	14000	2329	$6.01
L0P0F2T0	24000	5501	$4.36
L0P0F2T1	71000	6095	$11.65
L0P0F2T2	75000	6105	$12.29
L0P0F2T3	78000	6112	$12.76
L0P0F2T4	80000	6120	$13.07
L0P0F2T5	84000	6130	$13.70
L1P0F2T0	148000	7794	$18.99
L1P0F2T1	195000	8388	$23.25
L1P0F2T2	199000	8398	$23.70
L1P0F2T3	202000	8405	$24.03
L1P0F2T4	204000	8413	$24.25
L1P0F2T5	208000	8423	$24.69
L1P1F2T0	393000	9513	$41.31
L1P1F2T1	440000	10107	$43.53
L1P1F2T2	444000	10117	$43.89
L1P1F2T3	447000	10124	$44.15
L1P2F2T0	449000	11870	$37.83
L1P2F2T1	496000	12464	$39.79
L1P2F2T2	500000	12474	$40.08
L1P2F2T3	503000	12481	$40.30
L1P2F2T4	505000	12489	$40.44
L1P2F2T5	509000	12499	$40.72
No Action	0	0	0

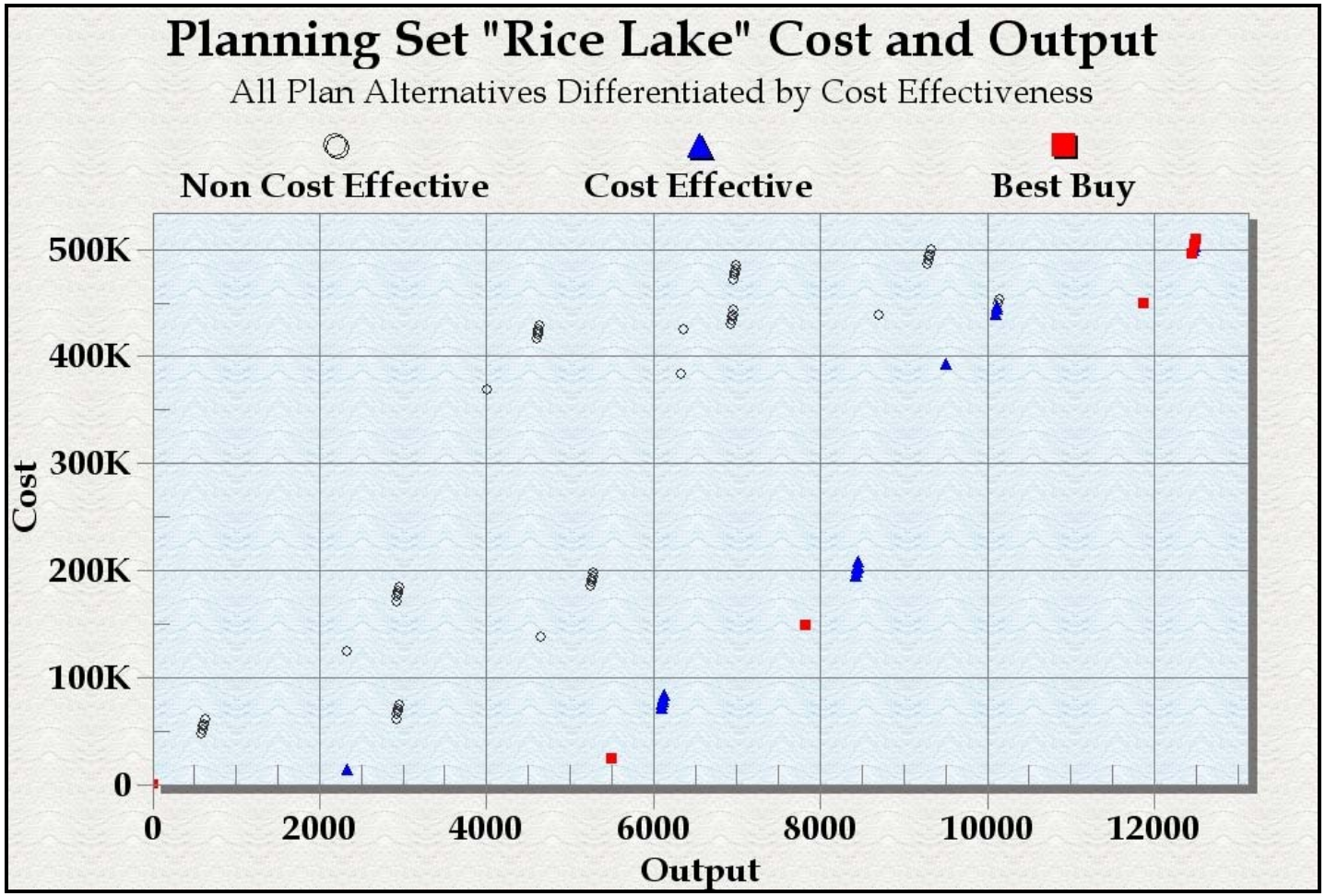

Figure D-1. Cost Effectiveness of Alternatives

Table D-10. "Best Buys" of Cost-Effective Alternative Combinations

Plan	Annualized Cost ($)	Outputs (AAHU)	Average Cost ($/AAHU)	Incremental Output (AAHU)	Incremental Cost ($)	Incremental Cost/Output ($/AAHU)
No Action Plan	0	0	$0	0	$0	$0.00
L0P0F2T0	24000	5501	$4.36	5501	$24,000	$4.36
L1P0F2T0	148000	7794	$18.99	2293	$124,000	$54.08
L1P2F2T0	449000	11870	$37.83	4076	$301,000	$73.85
L1P2F2T1	496000	12464	$39.79	594	$47,000	$79.92
L1P2F2T4	505000	12489	$40.44	25	$9,000	$360.00
L1P2F2T5	509000	12499	$40.72	10	$4,000	$400.00

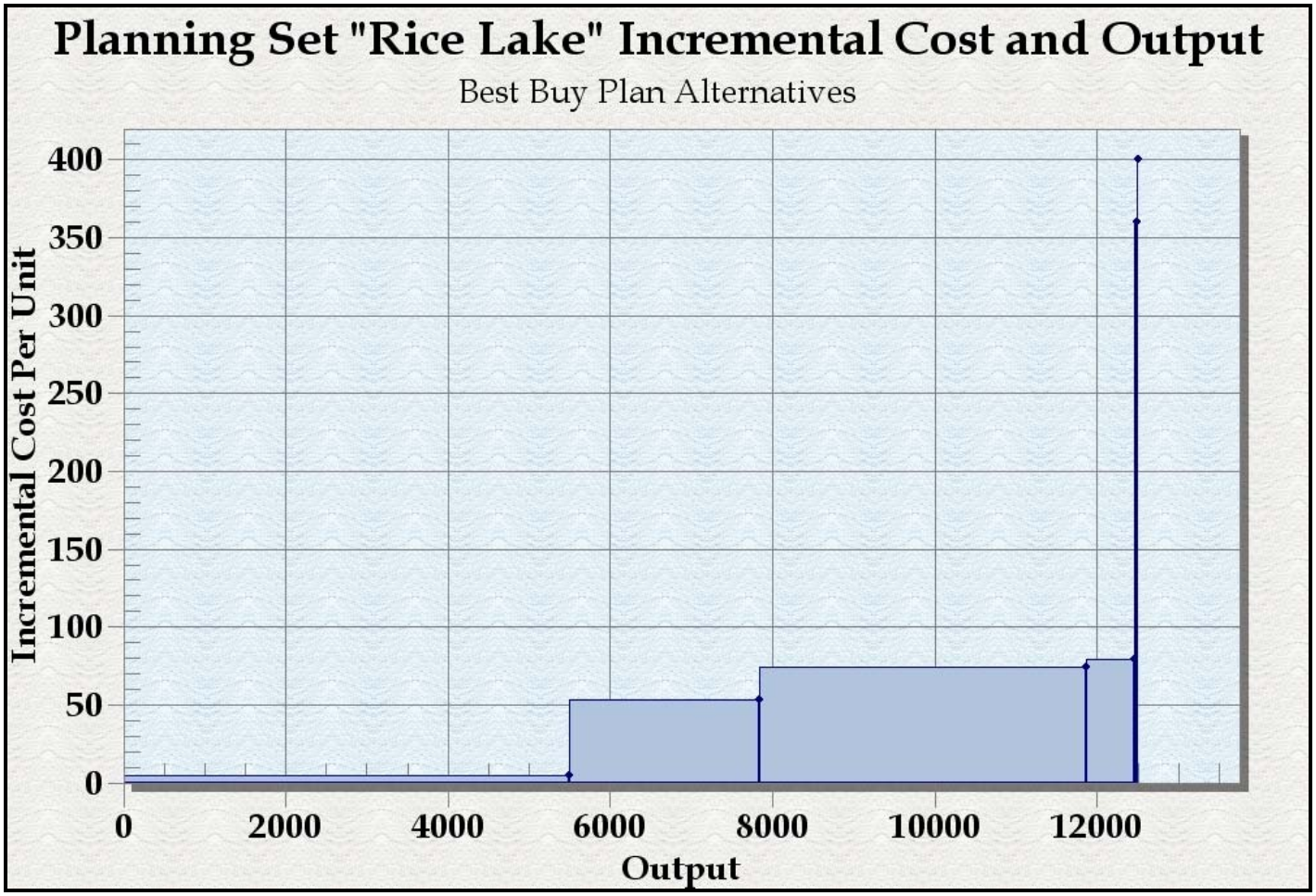

Figure D-2. Rice Lake "Best Buy" Plans

D. Selection of Recommended Plan. Federal planning for water resources development is conducted in accordance with the requirements of the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (P&G). The P&G provide a decision rule for selecting a recommended plan where both outputs and costs are measured in dollars. Under this rule, "The alternative plan with the greatest net economic benefit consistent with protecting the Nation's environment (National Economic Development Plan, NED Plan) is to be selected..." (paragraph 1.10.2). There is no similar rule for plan selection where outputs are not measured in dollars, as is the case in planning for environmental restoration and rehabilitation projects such as this HREP.

Neither cost effectiveness analysis nor incremental cost analysis includes a plan selection rule similar to the NED rule. In the absence of such a decision-making rule, neither analysis will indicate what choice to make. The information developed by CE/ICA will assist in making informed decisions and, once a decision is made, will help in better understanding its consequences in relation to other choices. However, this procedure should not be the sole source of information on which to base a decision. Other factors considered in this analysis were landscape of the site (including physical dynamics associated with the large river-floodplain ecosystem), management objectives of the resource agencies, critical needs of the region, and ecosystem needs of the Upper Mississippi River System.

The question posed to the interagency team involved in this analysis was, "Is the cost of the added increment in output worth the added costs?" The Rice Lake HREP team concluded that the alternative plan that best meets the goals and objectives of each agency and the EMP program is L1P2F2T5 (perimeter spillway at elevation 440.0, new pumping capacity for both Big Lake and Rice Lake, fish access to Duck Island gravel pit and Illinois River, and conversion of Duck Island cropfields to 352 acres native forest and 57 acres native wet meadow/grassland). This alternative is cost-effective and justified as a "Best Buy" plan. While the other cost-effective alternatives evaluated for this project would partially address the goals and objectives of the project, the consensus of the interagency team was that this alternative would reasonably maximize ecosystem restoration benefits for the greatest diversity of resident and migratory species, and that other cost-effective alternatives would be less effective in meeting project objectives. This alternative would also maximize the rare opportunity to restore a critical functional component of the floodplain ecosystem (mast-producing trees) on public lands by re-establishing a large (352 acres), self-sustaining, contiguous tract of this cover type within the Rice Lake SFWA. Establishment of such a large tract of mast-producing trees would also enhance the overall quality of existing floodplain forest throughout the SFWA and the surrounding vicinity. For these reasons, L1P2F2T5 is considered to be the NER plan.

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX E
GEOTECHNICAL CONSIDERATIONS

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APPENDIX E
GEOTECHNICAL CONSIDERATIONS

I. PURPOSE AND SCOPE

This appendix presents the general geology and specific geotechnical analysis pertinent to the project. Geologic information was obtained from publications produced by the Illinois State Geological Survey. Detailed soils information was obtained from borings collected under the direction of the Rock Island District, U.S. Army Corps of Engineers, (District) which also performed the laboratory interpretation of the samples. Additional soils information was obtained from a pre-published county soil survey obtained from the Illinois Department of Natural Resources in Fulton County.

II. DESCRIPTION OF PROJECT GEOTECHNICAL FEATURES

A. Discharge Channel. The channel will be used to fill Rice Lake, Big Lake, and the Voorhees moist soil management units. The channel consists of both new and existing embankments (figure E-1). The deepest section of the channel will consist of cut sections that are approximately 8 feet below the existing ground surface and small embankments approximately 2 feet above the existing ground surface. Shallow sections of the drainage channel will contain embankments that are approximately 4 feet above the existing ground and ditches that are 6 feet below existing ground.

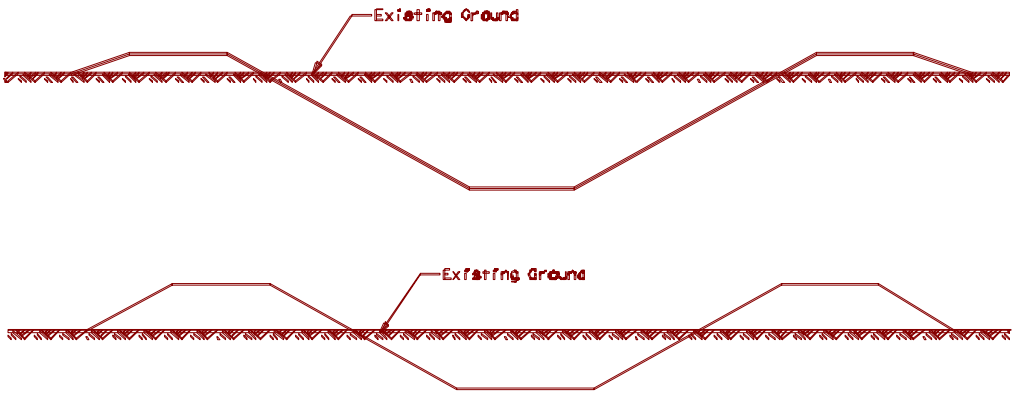

Figure E-1. Interior Channel Cross Section

B. Overflow and Overland Flow Spillway. Across the south end of Goose Lake, an overflow spillway will be constructed to elevation 440. The overflow spillway will be approximately 6 feet high at its maximum height and constructed of clay. It is anticipated that material would be excavated from Goose Lake using a large size bucket and side cast on the spillway alignment. The overland flow spillway will also be constructed to elevation 440 and extend adjacent to the river from the south end of Goose Lake to approximate River Mile 136.5. The combined overflow/overland spillway will allow the protected area to be completely filled with water during high water events.

C. Fish Egress between Gravel Pit and Rice Lake and between Goose Lake and Illinois River. The proposed connection between Rice Lake and the Gravel Pit on Duck Island and between Goose Lake and the Illinois River will consist of a 9-foot by 7-foot box culvert that will run through the narrow strip of land and connect the two main bodies of water. The invert elevation will be approximately 430 feet, which is 15 feet below the existing surface.

D. New Pump Station. Borings were taken at proposed locations to describe the foundation material present.

III. LOCATION

The Rice Lake EMP is located in Fulton County, Illinois, south of Banner, Illinois (plate 1). The site borders the Illinois River from river mile (RM) 132.0 to approximately RM 138.0.

IV. PHYSIOGRAPHY

The project area is situated within the Dissected Till Plains Section of the Central Lowlands Province of the Interior Plains. The project area has little topographic relief and consists of shallow backwaters, bottomland, and islands that are subject to permanent high water tables and annual flooding.

V. GEOLOGY

With the exception of Duck Island, the entire Rice Lake project area falls on a deposit called the Cahokia Alluvium. Alluvium is river-deposited material generally consisting of clayey silt and sandy silt with lenses of silty sand and gravel. The thickness of the deposit is generally less than 40 feet in the Illinois River Valley but may be up to 60 feet deep in some locations. Directly below the alluvial material lies bedrock that is Pennsylvanian in age. The bedrock consists of layers of limestone, shale, and sandstones. The bedrock has a slight dip in the southeast direction of about 15 feet per mile.

VI. SURFICIAL SOILS

The United States Department of Agriculture (USDA) publishes soil surveys for most counties in the United States. Information contained in these reports pertains to soil within 5 feet of the surface. These soils are mapped by soil series. A soil series is a group of soils having almost identical profiles. All soils of a particular series have horizons that are similar in compositions, thickness, and arrangement. Information in a pre-published soil survey indicated that the types of soils that are present in and around Rice Lake generally fall into the Beaucoup soil series, which is described as a silty clay loam in the USDA classification system. Duck Island surficial soils fall into a different series that is not discussed in the pre-published survey. Generally, soils in the upper 35 in of the profile classify as low plasticity clay (CL) in the Unified Classification system. Soils from 35 to 60 inches in depth classify as CL and CL-ML (low plasticity silt). The water table is said to vary from 0.5 feet above the ground surface to 2 feet below the ground surface. This soil series is frequently flooded.

With the exception of Duck Island, surficial soils of Rice Lake are fine-grained soils with over 80 percent passing the number 200 sieve. The soils generally classify as CL or ML in the Unified Classification System. Clay contents range from 15 percent to 35 percent. Soils on Duck Island contain more sand-sized material than the rest of the Rice Lake EMP site.

VII. SUBSURFACE EXPLORATIONS

The District conducted an extensive subsurface exploration to characterize the composition and engineering properties of soils present at Rice Lake. Borings were taken at locations shown on plate 31 of the Definite Project Report. A log for each boring was created; these logs are shown on plates 32, 33, and 34.

On each boring, samples were taken at sufficient intervals to classify all the strata encountered. Resistance to drive the split spoon sample was measured and recorded. Representative samples were taken for visual classification, compaction testing, and Atterberg limits on enough samples to verify classifications.

Borings RL-96-1 through RL-96-6 were used to characterize the foundation conditions at two proposed pump station locations (plate 31). Three borings were taken at each alternative. For each alternative, one boring approximately 50 feet deep was located at the proposed pump station site, one boring 50 feet deep was taken at the proposed head gate section, and one boring approximately 25 feet deep was taken between the head gate and pump station.

Borings RL-96-7 through RL-96-18 were used to identify soils and foundation conditions for the proposed discharge channel. Borings were approximately 25 feet deep, which made the bottom of the boring about three to 5 feet below the proposed bottom of the channel. Generally, the borings were taken approximately every 1,000 feet along the proposed alignment. Additionally, 50-foot-deep borings were taken at proposed water control structures.

Borings RL-96-19 through RL-96-23 were hand-auger borings taken from a boat to verify material types that have been deposited in the existing channel.

Borings RL-96-24 and RL-96-25 were taken within the Voorhees Unit.

Borings RL-96-26 through RL-96-29 were taken at 1,000-foot intervals along the overflow spillway. The borings were approximately 10 feet deep and were used for a slope stability and underseepage analysis of the proposed spillway.

Boring RL-96-35 is located at the proposed closure between Big Lake and the Gravel Pit. Boring RL-96-34 is located at a proposed connection between Rice Lake and the Gravel Pit.

VIII. COMPACTION TESTING

Standard Proctor compaction testing was performed on samples obtained from both the upper and the lower ends of Rice Lake. Samples from the upper end were combined to develop one curve, and samples from the lower end were combined to develop another curve. Both samples produced similar results. DPR plates 32, 33, and 34 show the results from the compaction testing. The optimum densities on each of the tests were 101 and 105 lbs for the lower sample and upper sample, respectively. The optimum moisture content for both samples was around 20 percent. The *in situ* water contents of the soils are closer to 30 or 40 percent. Based on the proctor curves developed in the lab, the 30 percent moisture content will yield a density about 90 percent of the maximum density. If fills on the project are to be fully compacted, then extensive measures will have to be taken to dry materials, which is often time consuming and expensive. Therefore, fill material will be placed at natural moisture content and compacted with controlled movement of spreading and hauling equipment or a certain number of passes with a sheeps foot and/or rubber-tired rollers.

The strength parameters selected for analysis will be based upon semi-compacted fill materials. Therefore, conservative values of analysis will be used.

IX. STABILITY OF INTERIOR CHANNELS

The stability of the embankments was analyzed in accordance with EM 1110-2-1913 “Design and Construction of Levees.” The UTEXAS-3 computer program was used to analyze the embankments and cuts proposed on the project. Both the discharge channel and the overflow spillway were analyzed for stability.

A. Geometry. Both the deep and the shallower channel sections were evaluated for stability. Borings RL-96-7 through RL-96-18 showed that the depth to sand varied between 15 and greater than 30 feet in depth. Two sections were modeled with the soil profile as shown. It is believed that sand any deeper than this would have no bearing on the stability of the interior channels.

Table E-1. Soil Properties Used for Stability Analyses

Top of Stratum Elevation	Material Type	Friction Angle, φ	Cohesion, c psf	Unit Weight, γ pcf
435	CL-CH	0	400	110
427	CH	0	500	115
417	CL-CH	0	400	110
411	SP-SC	0	250	100
407	CL-CH	0	250	100
397	GP-GC	32	0	125
391	Bedrock	--	--	--

B. Loading Conditions. EM-1110-2-1913 suggests that five different loading conditions be analyzed. Table E-2 shows the cases that were analyzed for this project. Preliminary analysis indicated that the End of Construction (Case 1) and Rapid (or Sudden) Drawdown (Case 2) were the most critical design conditions. Slopes designed for Cases 1 and 2 would also be stable under the other design conditions. The earthquake loading was not analyzed because the probability of a serious earthquake is low in this area and the soil's susceptibility to liquefaction is low.

Table E-2. Suggested Loading Conditions in EM 1110-2-1913

Case No. [1]	Design Condition	Slope Analyzed	Shear Strength	Minimum Factor of Safety
I(I)	end of construction	riverside and landside [2]	Q or S [3]	1.3
II(II)	sudden drawdown	riverside	S where < R R where < S [4]	1.0
III(IV)	intermediate river stage	riverside	S where < R (R + S)/2 where R < S [4]	1.4
IV(V)	steady seepage from full flood stage	landside	S where < R (R +S)/2 where R < S [4]	1.4
IV(VII)	earthquake: Cases I, III, and IV with seismic loading	riverside and landside	[5]	1.0

[1] Numbers in parentheses are corresponding cases described in paragraph 1-1x of EM 1110-2-1902 (ref. A-3a (4)).
[2] If high water can occur while this case applies, the additional increase in driving forces due to the water must be included in analyzing the landside slope.
[3] In zones where no excess pore water pressures are anticipated, use S strength.
[4] Composite shear strength envelope.
[5] Use shear strength applicable for case analyzed.

C. Selection of Shear Strength Parameters. Strength parameters are major inputs to a slope stability analysis. The strength parameters are described as a ϕ, and c. ϕ is the angle of internal friction and c is the cohesion. Equation 1 describes the shear strength.

Equation 1

$$S = c + \sigma \tan \phi$$

where: S = shear strength in (psi)
c = cohesion (psi)
σ = normal stress (psi)
ϕ = angle of internal friction

For the fine-grained soils, figure 3-2 in EM 1110-2-1913 shows a correlation between Plasticity Index (PI) and ϕ, and the correlation between ϕ and the c/p ratio where p is the previous maximum overburden pressure. Figure E-2 shows figure 3-2 from EM 1110-2-1913. The undrained shear strength was determined from a correlation published by the Virginia Polytechnic Institute in a document titled, *Shear Strength Correlations for Geotechnical Engineering.* The correlation relates undrained shear strength to the blow counts and PI and is shown in figure E-3.

For the cohesionless soils, c was assumed to be zero. The angle of internal friction was estimated based upon figure 3-5 in EM 1110-2-1913, which is shown in figure E-4.

As shown in table E-3, the standard penetration resistance ranged from 0 to 7 blows in the first 14 feet of depth for the soils. For design, the penetration resistance was selected to be 4. Also from the log, the Plasticity Index (PI) ranged from 17 to 44. For design, a PI of 30 was selected. Using figure E-4, the undrained shear strength for design was selected to be in the range of 400 to 500 pounds per cubic feet (pcf).

For the clay layers between elevations 411 and 407, the SPT blow counts were o blow per foot with the water content on the order of 36 percent. It is believed that this stratum of clay is normally consolidated. Therefore, it is appropriate to assign a value of cohesion for this stratum on the order of 250 psf.

EM 1110-2-1913
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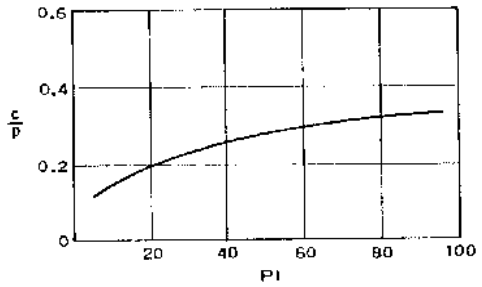
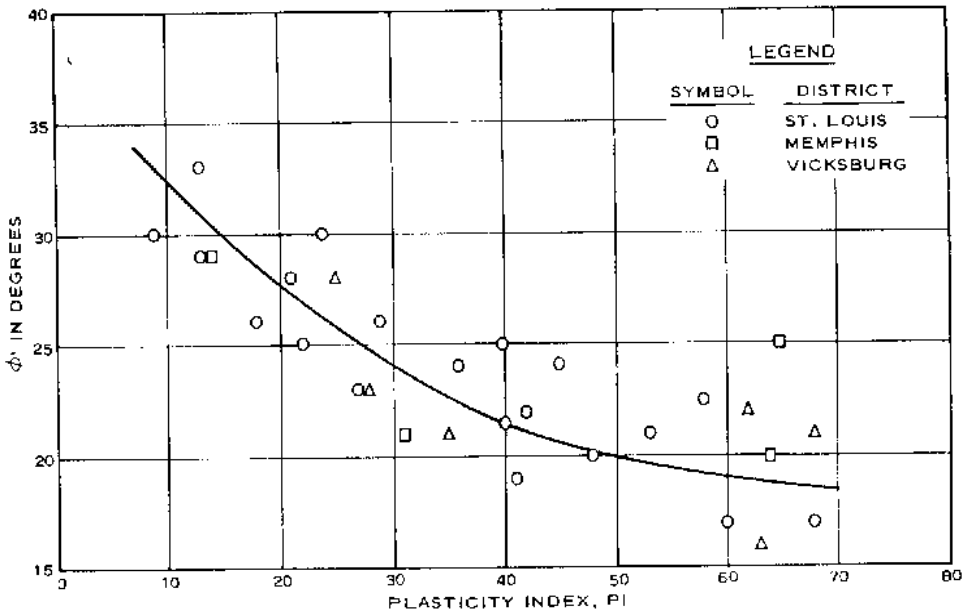


(a) c/p versus plasticity index for normally consolidated soils (after Bjerrum, ref. A-5a)



(b) Ø' versus plasticity index

3-7

Figure E-2. Figure from EM 1110-2-1913 Used To Estimate Drained phi and c

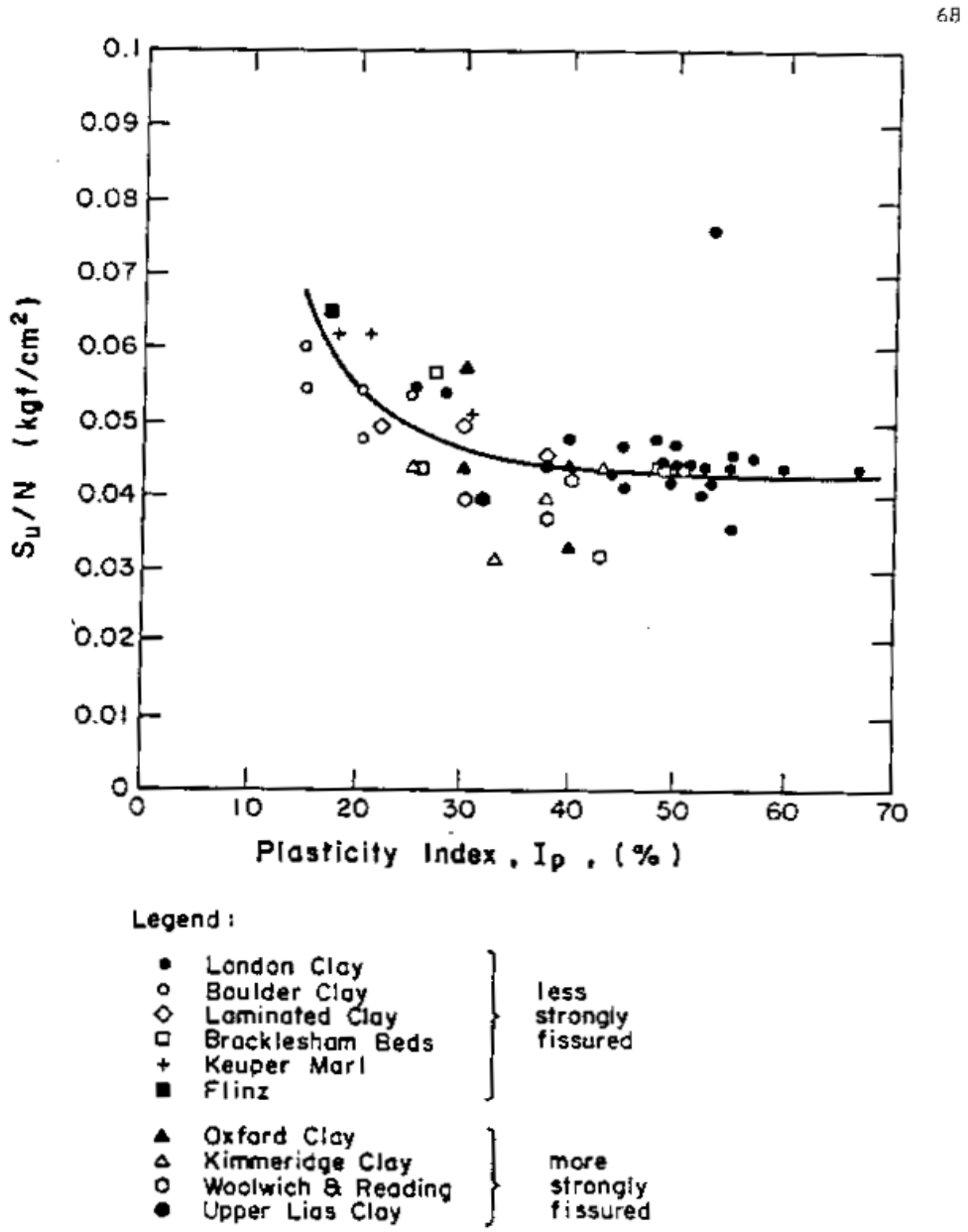


Figure E-3. Figure from EM 1110-2-1913 Used To Estimate Undrained Shear Strength of Soils

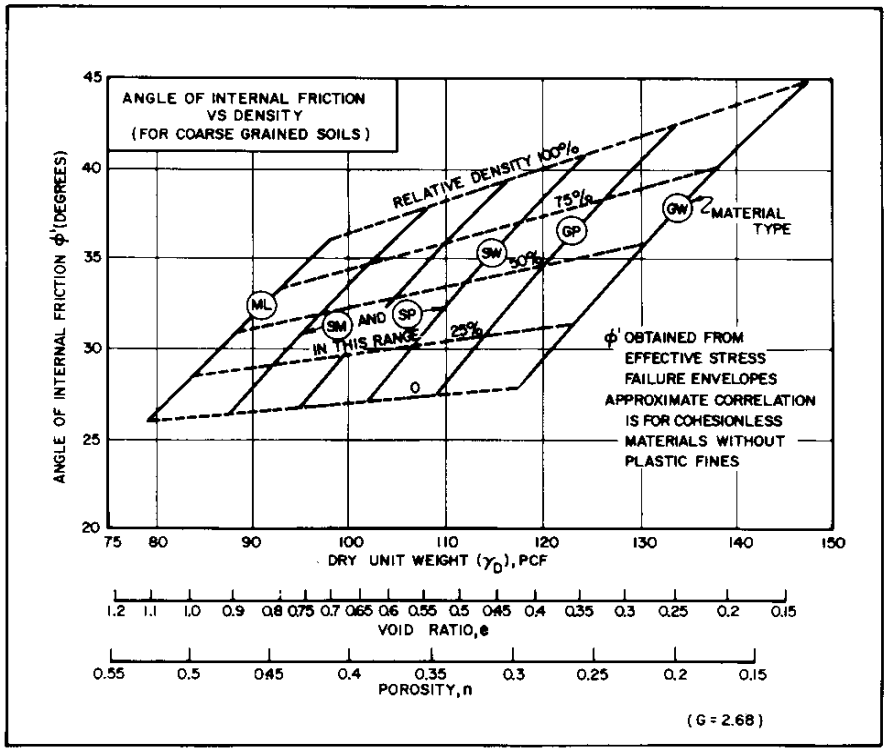


Figure E-4. Figure from EM 1110-2-1913 Used To Estimate Angle of Internal Resistance for Cohesionless Soils

Table E-3. Average Blow Counts Values for Discharge Channel

	Penetration Rate -N (Blows/Ft)										
Depth	**RL-7-96**	**RL-8-96**	**RL-9-96**	**RL-10-96**	**RL-11-96**	**RL-13-96**	**RL-14-96**	**RL-15-96**	**RL-16-96**	**RL-17-96**	**RL-18-96**
0	2	2	6	6	7	3	6	3	5	2	5
2.5	2	2	6	6	7	3	6	4	5	2	5
6	3	2	4	5	4	4	5	7	5	4	4
8	3	0	3	2	5	5	4	7	3	5	7
11	5	0	4	2	5	5	4	4	4	3	5
13	2	3	4	3	2	2	5	2	3	4	3
14	4										

It was felt that the stability of the structure was more dependent on the strength of the clay than on the shear strength of the sand. As a result, a conservative 32 degrees was selected of the ϕ of the sand. Most sand will have higher values of ϕ, but this was sufficient for the designs in this project. In the cases analyzed, the failure plane never passed through the sand. Therefore, the strength of the sand did not affect the factor of safety calculated.

Since the strength inputs were determined from correlation, the actual conditions could vary considerably from the estimated values. Therefore, a sensitivity analysis was performed to determine the sensitivity of proposed structures to design inputs.

D. Results of Slope Stability Analysis. The tabular results of the slope stability analysis are shown in table E-4.

Table E-4. Results Summary of Slope Stability Analysis

		Minimum Calculated Factor of Safety	
	Required Factor of Safety	4:1 Slopes	3:1 Slopes
End of Construction	1.3	5.79	3.63

It should be noted that the side slopes of the spillway sections are gentle and the height of the embankment is low. Therefore, it is believed that the spillway sections should be safe in stability, which is also reflected in the estimated relatively high factor of safety in the end-of-construction analyses. It was decided that the slope stability analysis for the other loading conditions are not necessary.

X. STABILITY OF OVERFLOW SPILLWAY

Originally, the proposed structure of the overflow spillway consisted of a dredged sand core with topsoil placed on top to promote vegetation growth. However, the current design calls for a clay spillway. The change was proposed because at certain locations the existing ground was not high enough to accommodate a sand core with a two-foot thick cover of topsoil. The spillway section would have a conservative factor of safety, as discussed previously.

Along the footprint of the old Hate Levee, it is anticipated that material would be excavated from Goose Lake using a large size bucket and side cast on the spillway alignment. This material would be placed without compaction and allowed to settle for approximately one year. After that time, the spillway would be graded and shaped to the design cross section.

Borings RL-96-26 through RL-96-29 indicate that clay layers extend to depths of approximately 20 feet (elevation 420+/-). This would indicate that underseepage would not be a problem for the overflow spillway.

XI. EXCAVATION AT PUMP STATION

Borings RL-96-1 through RL-96-6 show the soil profile for the proposed pump station structures. RL-96-1 and RL-96-4 are located at proposed locations of the pump stations. RL-96-2 and RL-96-5 are located at the midpoint between the headgate and the pump station. Borings RL-96-3 and RL-96-6 are located at proposed pump stations.

Borings RL-96-1, RL-96-2, and RL-96-4 indicate that fine sands are present in the upper 6 feet of the soil. Under the sand layers, relatively soft clay layers are found which extend to approximately elevation 420. Then, sands and clayey sands are found until the bottom of the borings. Borings RL-96-3, RL-96-5, and RL-96-6 indicate lean clays until approximately elevation 420. Below, fine sands and clayey sands extend to the bottom of the boring. The borings indicate that the water table is within 5 feet of the surface.

While excavation for the structures will require no special equipment, precautions will have to be taken to maintain stable excavation slopes and a dewatered excavation. This may include shoring and/or pumping.

XII. EXCAVATION FOR CONNECTION OF QUARRY PIT TO RICE LAKE

Boring RL-96-34 was taken at the proposed location of the connection between the Quarry Pit and Rice Lake. Above elevation 430, the soil profile generally consists of sands, sandy clays, and clayey sands. Below elevation 430, the profile consists entirely of sands. Open excavation will require a dewatering system. Additionally, a temporary construction shoring will be required for the excavation of the culvert between the two lakes.

XIII. RECOMMENDATIONS

It is recommended that features adhere to the minimum requirements for slopes outlined in the above document.

- Interior Channels: Slopes should consist of 3H to 1V. Embankments should have 3H to 1V slopes with 10-foot minimum crown widths. Embankment material should consist of cohesive soils from the adjacent cut sections.

- Overflow spillway: The crown width should be 10-foot minimum. Adjacent to the river, slopes shall be at least 3H to 1V. Along the old Hate Levee, slopes shall be at least 3H to 1V. Embankment material would be excavated from the adjacent Goose Lake.

- Excavations for structures will be able to be accomplished using conventional construction methods. Precautions will be required to assure stable and dewatered excavations at some locations.

XIV. REFERENCES

EM 1110-2-1913, "Design and Construction of Levees."

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UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX F
WATER QUALITY

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
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APPENDIX F
WATER QUALITY

I. PURPOSE

The purpose of this appendix is to discuss the results of baseline water quality monitoring performed at Rice Lake. Water quality monitoring was performed in an effort to define present water quality conditions and to identify potential problem areas.

II. GENERAL

Water quality at Rice Lake is dominated by the shallow nature of the lake coupled with lake management practices. Typically during the summer months, the lake is drawn down to allow for the production of moist soil vegetation that is utilized as a food source by waterfowl.

Preliminary discussions regarding the Rice Lake project called for construction of several islands throughout the Rice Lake complex for the purpose of improving water quality by reducing the resuspension of sediments due to wave action. In response to the construction proposal, a water quality monitoring program was implemented. Beginning in May 1987, Rice Lake water quality was monitored at site W-I135.4B. The location of this site is shown in the monitoring plan (see plate 35 of the Main Report). As the project evolved, it was determined that island construction was no longer a feasible alternative; therefore, the island component was dropped from further consideration. Because of this, the final sampling event occurred on February 15, 1994.

III. METHODS

Pre-project water quality monitoring sampling was accomplished by Corps of Engineers Water Quality and Sedimentation Section personnel on December 20, 1991; February 1, 1993; and February 15, 1994. Daily and Associates, Engineers, Inc., Peoria, Illinois, collected the remaining samples under contract to the Corps. On each sampling event, a water sample was collected just below the surface. Samples requiring laboratory analysis were placed on ice. Samples collected by Daily and Associates, Engineers, Inc., were analyzed by their in-house laboratory, while Corps samples were shipped to ARDL, Inc., Mt. Vernon, Illinois, for analysis.

Turbidity and alkalinity samples collected by the Corps were analyzed in-house. Sample collection/preservation and field/laboratory analytical procedures were performed according to the American Public Health Association, *et al*. (1985, 1989 or 1992) or the U.S. Environmental Protection Agency {USEPA (1983)]. Sampling date, time, water depth, Secchi disk depth, water velocity, wave height, air temperature, percent cloud cover, wind speed and direction, pH, water temperature, dissolved oxygen (D.O.), and conductivity were recorded in the field. In general, quality control procedures for the number of field duplicates, replicate analyses, spiked samples, control samples, and blanks run followed the guidelines of the USEPA of 1979 or 1986.

IV. RESULTS AND DISCUSSION

The results from baseline water quality monitoring at Rice Lake site W-I135.4B are given in table F-1. Sampling commenced on May 27, 1987, and ended on February 15, 1994. The sampling site was often inaccessible during the summer months when the lake was drawn down.

The results from pH and D.O. measurements were compared against Illinois General Use Water Quality Standards. The acceptable pH range is 6.5 through 9.0. Values outside this range are acceptable when they are due to natural causes. Five pH values exceeded the maximum of 9.0; however, all appear to be due to natural causes. In each instance, D.O. and chlorophyll *a* concentrations were also relatively high, indicating the high pH values were probably a result of algal photosynthesis. The Illinois General Use Water Quality Standards state that D.O. concentrations shall not be less than 6.0 mg/l during at least 16 hours of any 24-hour period, nor less than 5.0 mg/l at any time. A review of the data indicates the D.O. concentration was below 5.0 mg/l on four occasions: July 10, 1990 (4.60 mg/l), September 7, 1990 (4.10 mg/l), October 17, 1990 (0.90 mg/l) and May 27, 1992 (0.40 mg/l). A combination of below average chlorophyll *a* concentrations, heavy cloud cover, and early sampling time appear to be responsible for the low D.O. concentrations. On all four sampling days, the chlorophyll *a* concentration was below the average value of 137.7 mg/m^3, with the highest concentration being 56 mg/m^3 on October 17, 1990. The cloud cover on July 10, 1990, and September 7, 1990, was 100 percent. Except for the September 7, 1990, sampling event, the sampling time was at or before 8:10 a.m.

Suspended sediment concentrations at Rice Lake were relatively high, averaging 62.60 mg/l. This is probably a result of resuspension of bed sediments due to wind-generated waves, with high algal concentrations also being a contributing factor.

V. CONCLUSIONS

Baseline water quality monitoring studies at Rice Lake have shown that on occasion, pH values exceed 9.0 and dissolved oxygen concentrations fall below 5 mg/l. Periodic extreme plant photosynthesis/respiration would appear to be the primary factors contributing to these events. The shallow nature of the lake, coupled with the aquatic vegetation present, most likely result in wide swings in pH values and D.O. concentrations during a typical summer day. A combination of resuspended bed material and algal biomass appear to be the factors resulting in the lake's relatively high suspended solids concentration.

Appendix F
Water Quality

Table F-1. Water Quality Monitoring Results From Samples Collected at Site W-I135.4B

Date	Water Depth (Ft)	Velocity (Ft/Sec)	Wave Height (Ft)	Air Temp (°C)	Cloud Cover (%)	Wind Speed (mph)
5/27/1987	4.80	-	-	29	-	15
6/9/1987	4.80	-	-	23	-	10
6/23/1987	3.30	-	-	27	-	5
7/7/1987	1.90	-	-	29	-	10
9/15/1987	1.60	-	-	24	-	0
9/30/1987	2.60	-	-	21	-	10
10/13/1987	2.50	-	-	16	-	5
10/27/1987	3.10	-	-	8	-	5
6/26/1990	9.00	0.380	0.3	26	90	2
7/10/1990	7.00	0.400	0.2	27	100	2
7/25/1990	7.00	0.060	0.8	26	10	8
8/8/1990	5.00	0.120	0.0	26	40	2
8/23/1990	4.50	0.580	0.2	24	100	2
9/7/1990	5.50	0.040	0.8	28	100	8
9/19/1990	4.00	-	0.5	18	100	5
10/2/1990	4.00	0.030	0.5	28	0	2
10/17/1990	3.50	0.270	1.0	19	25	10
10/30/1990	4.00	0.250	0.5	22	0	8
5/21/1991	7.00	0.140	0.2	27	100	3
6/5/1991	8.00	-	2.0	26	0	20
6/18/1991	5.00	0.070	0.2	29	5	3
7/1/1991	2.00	0.150	0.5	29	5	8
12/20/1991	3.80	0.047	0.0	0	100	0
5/12/1992	3.00	0.110	0.5	31	80	2
5/27/1992	4.00	-	0.5	10	0	2
6/9/1992	3.00	-	0.5	30	80	8
8/5/1992	2.00	0.020	0.5	27	95	8
2/1/1993	10.00	0.152	*	3	0	2
2/15/1994	4.60	0.045	*	3	5	8
MIN	**1.60**	**0.020**	**0.0**	**0**	**0**	**0**
MAX	**10.00**	**0.580**	**2.0**	**31**	**100**	**20**
AVG.	**4.50**	**0.168**	**0.5**	**22**	**49**	**6**

* Not applicable, ice cover

Appendix F
Water Quality

Date	Wind Direction	Water Temp. (°C)	D.O. mg/l)	Ph (su)	Total Alkalinity (mg/l as Caco3)
5/27/1987	SW	24.0	14.00	9.40	-
6/9/1987	NE	25.0	10.50	9.50	-
6/23/1987	NE	32.0	7.10	9.30	-
7/7/1987	SW	27.0	11.50	9.20	-
9/15/1987	-	23.0	7.70	8.20	-
9/30/1987	NW	21.0	11.50	8.90	-
10/13/1987	SW	11.0	12.40	9.00	-
10/27/1987	SW	9.0	13.00	9.00	-
6/26/1990	SW	24.0	6.70	7.95	170
7/10/1990	NW	23.0	4.60	8.39	170
7/25/1990	S	26.0	12.60	8.60	180
8/8/1990	S	29.0	15.80	8.78	180
8/23/1990	SE	25.5	6.40	8.40	190
9/7/1990	NW	30.0	4.10	8.14	200
9/19/1990	N	18.0	8.60	8.53	200
10/2/1990	SE	21.0	7.40	8.56	190
10/17/1990	S	16.6	0.90	8.37	180
10/30/1990	SW	13.3	9.50	8.71	240
5/21/1991	SE	24.0	16.80	8.60	140
6/5/1991	N	26.0	8.80	8.70	150
6/18/1991	NW	28.0	15.40	9.00	170
7/1/1991	SW	32.0	13.30	9.30	150
12/20/1991	-	3.2	16.24	8.85	145
5/12/1992	N	27.0	12.70	8.40	110
5/27/1992	N	16.0	0.40	7.90	180
6/9/1992	NE	27.0	14.00	9.00	150
8/5/1992	N	23.0	5.90	8.80	120
2/1/1993	N	4.2	17.11	8.74	155
2/15/1994	NW	4.8	18.82	8.05	70
MIN	**-**	**3.2**	**0.40**	**7.90**	**70**
MAX	**-**	**32.0**	**18.82**	**9.50**	**240**
AVG.	**-**	**21.2**	**10.47**	**-**	**164**

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Water Quality

Date	Specific Conductance (µMHOS/cm @ 25°C)	Secchi Disk Depth (Ft)	Turbidity (NTU)	Suspended Solids (Mg/L)
5/27/1987	510	0.70	-	92.00
6/9/1987	520	0.50	-	71.00
6/23/1987	530	0.50	-	57.00
7/7/1987	550	0.30	-	210.00
9/15/1987	580	0.40	-	110.00
9/30/1987	480	0.40	-	110.00
10/13/1987	590	0.55	-	52.00
10/27/1987	520	0.70	-	40.00
6/26/1990	610	1.60	9	15.00
7/10/1990	580	1.05	12	29.00
7/25/1990	560	0.90	18	31.00
8/8/1990	590	0.60	26	49.00
8/23/1990	570	0.60	34	64.00
9/7/1990	590	0.80	90	62.00
9/19/1990	580	0.70	90	11.00
10/2/1990	560	0.90	62	50.00
10/17/1990	570	0.65	150	80.00
10/30/1990	650	0.90	74	8.00
5/21/1991	480	1.10	-	10.00
6/5/1991	580	0.90	13	28.00
6/18/1991	490	0.85	11	24.00
7/1/1991	510	0.40	56	120.00
12/20/1991	499	1.05	13	15.00
5/12/1992	630	0.30	81	99.00
5/27/1992	640	0.60	48	69.00
6/9/1992	610	0.55	38	89.00
8/5/1992	450	0.25	26	210.00
2/1/1993	484	*	7	5.30
2/15/1994	536	*	3	5.20
MIN	**450**	**0.25**	**3**	**5.20**
MAX	**650**	**1.60**	**150**	**210.00**
AVG.	**553**	**0.69**	**43**	**62.60**

* Not applicable, ice cover

Appendix F
Water Quality

Date	Chlorophyll a (mg/m3)	Chlorophyll b (mg/m3)	Chlorophyll c (mg/m3)	Pheophytin a (mg/m3)
5/27/1987	450.0	<21	87.0	62.0
6/9/1987	320.0	7.0	62.0	100.0
6/23/1987	340.0	<4	48.0	62.0
7/7/1987	660.0	72.0	70.0	130.0
9/15/1987	290.0	<2	67.0	220.0
9/30/1987	250.0	16.0	38.0	110.0
10/13/1987	130.0	9.0	27.0	94.0
10/27/1987	210.0	15.0	23.0	29.0
6/26/1990	17.0	3.0	<2	<2
7/10/1990	20.0	8.0	7.0	8.0
7/25/1990	48.0	<2	5.0	27.0
8/8/1990	32.0	<2	<2	<2
8/23/1990	84.0	7.0	2.0	34.0
9/7/1990	8.0	5.0	<2	9.0
9/19/1990	111.0	9.0	2.0	27.0
10/2/1990	46.0	<2	<2	44.0
10/17/1990	56.0	<2	5.0	42.0
10/30/1990	16.0	<2	<2	25.0
5/21/1991	50.0	5.0	3.0	9.0
6/5/1991	28.0	3.0	3.0	42.0
6/18/1991	36.0	<2	3.0	2.0
7/1/1991	160.0	10.0	5.0	2.0
12/20/1991	120.0	3.8	21	32.0
5/12/1992	40.0	3.0	7.0	72.0
5/27/1992	4.0	4.0	3.0	80.0
6/9/1992	192.0	3.0	16.0	21.0
8/5/1992	240.0	5.0	23.0	12.0
2/1/1993	20.7	17.2	11.9	80.3
2/15/1994	13.2	<1.3	4.6	<2.7
MIN	**4.0**	**<1.3**	**<2**	**<2**
MAX	**660.0**	**72.0**	**87.0**	**220.0**
AVG.	**137.7**	**-**	**-**	**-**

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DEFINITE PROJECT REPORT
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LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
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APPENDIX G
HYDROLOGY AND HYDRAULICS

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APPENDIX G
HYDROLOGY AND HYDRAULICS

I. INTRODUCTION AND LOCATION

The project site is located on the west bank of the Illinois River between river miles (RM) 132.0 and 138.0, see Plate 1 of main report. Plate 6 of the main report shows the proposed overland spillway alignment. Natural high ground isolates much of the lakes from Illinois River during low level flood discharges. The proposed project will improve habitat for fish and migratory waterfowl by controlling lake levels when the Illinois River is below elevation 440 ft (National Geodetic Vertical Datum 1929). All elevations used in this appendix use National Geodetic Vertical Datum 1929 (NGVD29).

The first hydrologic appendix was completed in 1996, but additional work and design changes have been requested. Work summarized in this appendix covers work for the 1996 version through Fiscal Year 2010.

The site is located upstream of the La Grange Lock and Dam (RM 80.1) where the flat pool elevation is 429.0 ft. The nearest operating gages are at Havana (RM 119.6), Copperas Creek (RM 136.9), and Kingston Mines (RM 145.4). River miles were taken from Reference 1. The drainage area of the Illinois River is 18,299 square miles (sq mi) at the Havana gage and 15,819 sq mi at the Kingston Mines gage (Reference 5).

II. CLIMATE

The National Weather Service at Havana, Illinois, recorded the climatological data used for the project site. The data shown in table G-1 are from the period 1901 to1966. The gage identification number is 3930.

The average annual daily minimum temperature was 42 degrees Fahrenheit (F), while the average annual daily maximum temperature was 64 degrees F. However, the temperatures in central Illinois can fluctuate over an extreme range. Average monthly temperatures range from a maximum of 89.2 degrees F in July to a minimum of 17.5 degrees F in January. The precipitation is moderate, with an average annual value of 34.0 inches (in). The average annual snowfall is 21.4 in.

Table G-1. Average and Extremes of Monthly Precipitation

	Precipitation					Snow		
	Average	Maximum		Minimum		Averag	Maximum	
Month	(in)	(in)	Year	(in)	Year	(in)	(in)	Year
Jan	1.83	9.74	1916	0.02	1919	5.58	22.9	1918
Feb	1.49	4.35	1908	0.05	1947	4.70	14.2	1908
Mar	2.78	7.30	1901	0.26	1910	4.43	23.5	1960
Apr	3.62	7.68	1957	0.89	1901	0.68	11.5	1920
May	3.76	9.82	1935	0.39	1934	0.00		
Jun	4.05	9.68	1947	0.40	1933	0.00		
Jul	3.50	10.95	1937	0.25	1916	0.00		
Aug	3.12	7.16	1965	0.52	1935	0.00		
Sep	3.61	13.14	1911	0.07	1940	0.00		
Oct	2.42	12.22	1941	0.12	1964	0.13	3.05	1925
Nov	2.14	6.78	1942	0.04	1914	1.07	9.70	1926
Dec	1.68	5.82	1949	0.26	1919	4.71	15.2	1942

III. ILLINOIS RIVER

A. Flood Conditions. Although the proposed project will flood during high water it is useful to know water levels at the site. Plate G-1 shows the flood profiles on the Illinois River in the vicinity of the project site. These profiles were taken from Reference 4. It is noted here that the *Upper Mississippi River System Flow Frequency Study: Hydrology and Hydraulics Appendix C* by the Rock Island District (January 2004), resulted in slightly different flow frequency-elevation relationships at the project site. Reference 4 continues as the basis for the design of this HREP project.

B. Stage Hydrographs and Stage Duration. The stage hydrographs from 1960 through 2008 appear on Plates G-2 through G-18. Plate G-19 shows the stage-duration curve derived from daily data for the years 1960-1994. Daily stages were recorded at the Copperas Creek gage adjacent to the project site; elevations are in feet NGVD.

IV. NEW PUMP STATION AND DISCHARGE CHANNEL

During the fall season, pumps located along the Illinois River will be used to raise the water level of the lakes and moist soil units. Originally these pumps totaled 100,000 gallons per minute (gpm), but in 2004 the capacity was increased to 133,200 gpm to fill the lakes and moist soil units within 15 days. The project also consists of digging a new discharge channel between the pump station and the lakes and moist soil units (see Plate 21 of main report).

Plate G-20 lists the lowest and highest annual recorded stage on the Illinois River at Copperas Creek gage (1960 through 2008). Low stages often occurred during months when the pumps would be operating in September and October. The mean annual low water elevation for the 49-year period of record is 430.3 feet with a standard deviation of 0.7 feet. The elevation 430.3 feet was used as the low

water level to design the pump station. During the 49-year period, stages at Copperas Creek dropped below elevation 430.0 feet 27 times, for a total of 57 days. The durations lasted from one day (13 times) to six days (one time). The lowest observed stage was 429.2 feet.

Several bottom widths were examined for the discharge channel from the pump station to the lakes. The design chosen was a dirt channel with a bottom width of 30 feet, side slopes of 3H to 1V, and a constant bottom at elevation 430.0 feet (see Plate 21 of the main report). Maximum mean channel velocities recommended by *EM 1110-2-1601* for various channel materials are two feet per second for sandy silt, three and one half feet per second for silt clay, and six feet per second for clay. Table G-2 lists the depth, velocity, and Froude number for various discharges.

Table G-2. Discharge Channel Flow Conditions for Various Discharges

# of pumps	Discharge (gpm)	Velocity (feet/sec)	Froude #	Flow depth (feet)
1	44,400	.82	.09	3.08
2	88,800	1.02	.10	4.46
3	133,200	1.04	.09	5.98

Scour protection of the discharge channel at the outlet of the pump station is required to prevent erosion. Articulated Concrete Matting (ACM) was selected for scour protection due to the unique geometry and high discharge rates. Plates 28 and 29 of the main report show the pump station plan, profile, and detail. Several simplifying assumptions were necessary in determining coverage of the ACM. The pipe velocity (10.3 fps) for the highest discharge rate (133,200 gpm) and the assumption that the pump station outlet apron is a rectangular channel were used to calculate the length of the resulting hydraulic jump. The length of the hydraulic jump was calculated using Figure 6 from *Hydraulic Design of Stilling Basins and Energy Dissipators* (Reference 3). This length was used as the length to extend the scour protection downstream of the pump station outlet; in actuality, the jump will most likely occur at the end sill of the concrete apron where the flow enters the discharge channel. The jump will be approximately 7 feet long. It is recommended that the ACM be placed on the bed and to the top of the banks (approximately elevation 436.0 feet) of the discharge channel around the pump station outlet and extended 20 feet downstream of the pump station outlet.

V. METHODS TO FLOOD THE INTERIOR BEFORE A FLOOD ON THE ILLINOIS RIVER

An early alternative that was abandoned was to build levees along the Illinois River and across Goose Lake to elevation 442 feet and add an overflow spillway to flood the interior during rising river stages. . Other methods like operating the proposed pumps or installing gates were also evaluated based on the interior water surface elevation after a 48 hour flood. The spillway, pumps, and gates are discussed in this section although they were not adopted.

The recommended plan uses existing high ground along the Illinois River (which varies in elevation from 440 to 443 feet) combined with a berm across Goose Lake with a crest elevation of 440 feet to create a perimeter spillway to control interior water elevations. This spillway will be overtopped continually during the project life. Damage to the proposed spillway can be reduced by raising the

interior water level before the Illinois River flows over the spillway crest and by armoring the spillway segment across Goose Lake. The adopted alternative for flooding the lakes is discussed later under Section D (Appendix G) and consists of constructing a perimeter water control spillway across the lake at elevation 440 feet. No levees will be built on the high ground along the Illinois River RM 133 to 137. Thus much of the with-project response to flood events will be similar to the without-project response. Obviously it is desirable but not essential that the interior water surface elevation be as high as possible when water overtops the spillway at the final river stage (440.0 feet) after a 48 hour flood.

A. Levee Spillway Section. This portion of the appendix summarizes the analysis of overflow spillway section an alternative that was not adopted. The minimum section is 2,500 feet long with a crest at elevation 440.0 feet. The approach consisted of developing an inflow hydrograph and routing it into the interior lakes. The inflow hydrograph was based on observed events on the Illinois River. However, the presence of an existing, downstream levee of about elevation 450.0 feet and running parallel to the proposed levee caused this proposal to be abandoned.

1. Discharges through the Spillway Section. The spillway was evaluated using the same stage hydrograph discussed later under the flow corridor model. The stage was assumed to rise steadily from elevation 440.0 feet to elevation 442.0 feet in 48 hours. The discharge hydrograph into the interior area used in the HEC-1 model was computed using the weir equation:

$$Q = CLH^{1.5}$$

The weir coefficient (C) was initially 2.8 and was increased to 3.0 for depths above the weir crest greater than 1.5 feet. The coefficient was obtained from Reference 2 (page 5-43). Similar coefficients were also found in Reference 6 (2.7 for a head of one foot and 3.0 for a head of two feet). The weir length (L) is 2,500 feet. The height (H) is the difference between the Illinois River stage and the weir crest (elevation 440.0 feet).

After a trial HEC-1 run, the inflow hydrograph was modified. During the last 14 hours of the HEC-1 routing, the water level of Big Lake exceeded elevation 440.0 feet and submerged the spillway. A plot in Reference 2 (page 5-18) was used to estimate the reduction in discharge from the submerged condition. The plot related the ratio of the depths of water upstream and downstream of the weir to the ratio of the submerged discharge to the unsubmerged discharge. The submerged discharge varied from 0.98 to 0.65 of the unsubmerged discharge.

2. Maximum Interior Water Level with Spillway Section. The spillway HEC-1 model contained two routings. The discharge hydrograph (from the Illinois River) was routed into Unit 1 which simulates the combined areas of Goose Lake, Big Lake, Lower Slim Lake, and adjacent management units. The outflow from the Unit 1 was then routed into Unit 2 which simulates Rice Lake and adjacent management units. Elevation-area data were obtained from Reference 1 (table 4-1) and are repeated in table G-3.

When the level of Big Lake exceeds 439.0 feet, water will flow over the Narrows Dam and enter Rice Lake. This flow was estimated for various levels in Big Lake using the weir equation and entered in

the outflow table of Unit 1 (see table G-3). By the time the level in Big Lake reaches elevation 441.0 feet, the weir between Big Lake and Rice Lake is submerged. The discharge from Big Lake to Rice Lake for elevations 441.0 and 442.0 feet was decreased to reflect reduced flow due to submergence.

Table G-3. Elevation-Area Data Used in Spillway Model

Water Surface Elevation (feet)	Unit 1 Area (acres)	Unit 1 Outflow (cfs)	Unit 2 Area (acres)
434.0	1226		
435.0	1675		1136
436.0	2006		1199
437.0	2227		1294
438.0	2440		1441
439.0	2620		1906
439.25		378	
439.5		1516	
439.75		2786	
440.0	2800	4290	2485
441.0	2873	10000	2590
442.0	2941	10000	2693

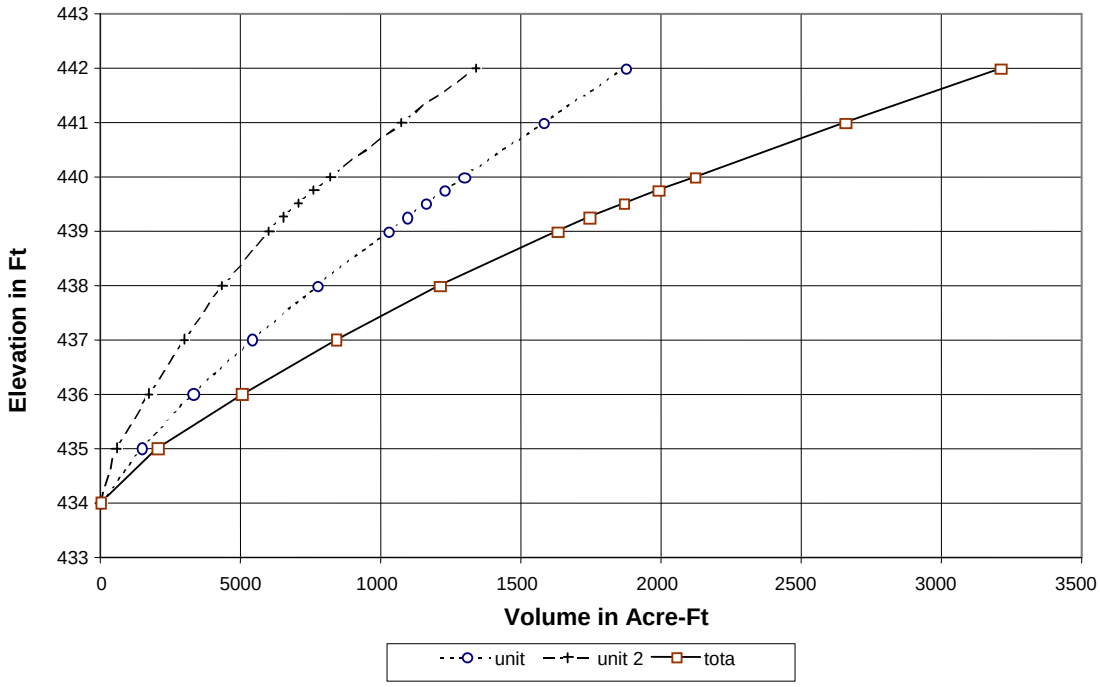

Figure G-1. Volume-Elevation for Rice Lake Interior Area

Otherwise, the weir coefficient varied from 2.6 to 2.8 and the weir length was 1,650 feet long. The volume-elevation plot is shown in figure G-1. The starting water level for Big Lake (Unit 1) was set at elevation 434.0 feet while the starting water level for Rice Lake (Unit 2) was set at 435.0 feet. The discharge hydrograph used a one-hour time interval; the same interval was used for the computation interval. The maximum computed interior water levels at the end of 48 hours, rounded to the nearest foot, can be seen in table G-4.

Table G-4. Maximum Interior Water Surface Elevations with Spillway Section

Location	Water Level (feet)
Illinois River	442
Big Lake (Unit 1)	442
Rice Lake (Unit 2)	441

B. Pump Alternative. The pumps used to regulate water levels in the fall could also be used to help flood the interior. However, operating the pumps for only two days (maximum overtop rate of rise) causes an insignificant increase in interior water level. Since pumps require about 15 days to raise the interior water surface from elevation 435.0 feet to 437.0 feet.

C. Gate Alternative. The possibility of using gates similar to the three control structures built at Lake Chautauqua was also explored. Unfortunately, the volume required to flood the interior associated with the Rice Lake Project is substantially larger than Lake Chautauqua and would require 15 gates. Each gate would be 10 feet wide, 10 feet tall and have a sill at elevation 434.0 feet. Gates would be opened when the river elevation reached elevation 440.0 feet. The gates allow the interior water level to reach elevation 442.0 feet within two days, assuming that the river rises at a rate of one foot per day. As the interior water level rises, the gates become submerged; this reduces the inflow by about one half of the original rate.

D. Overland Flow Corridor with Adopted Alternative. The overland flow corridor is the high ground between the Illinois River and Goose Lake along RM 133 to RM 136. This ground varies from elevation 440 feet to 443 feet. The flow corridor begins at the southeast end of the old Hate Levee and extends upstream along the northwest bank (right descending) of the Illinois River. Overflow along this path was estimated to determine how much it increases the interior water level at the downstream spillway segment across Goose Lake. The estimate was made by determining an inflow hydrograph and then routing this volume into the storage table of the interior lakes. It is estimated to increase the interior water level from elevation 434 feet to elevation 437 feet in two days.

1. Discharges through the Overland Flow Corridor. Discharges through the corridor were calculated every hour for a total period of 48 hours. The corridor was divided into 4 segments then the rating curves for each segment were added to produce one curve for the corridor. Each segment had similar ground elevations. The discharge for each segment is mainly a function of the corridor width, ground elevations, and elevation of the Illinois River. The elevation of the Illinois River at the project site was assumed to increase linearly from elevation 440.0 feet to elevation 442.0 feet in two days (48 hours). The maximum observed stage increase for the Illinois River to rise from elevation 440.0 to

442.0 feet was 1.5 feet in 1 day and 2 feet in 2 days (see page 52 of Reference 1). The stage was assumed to rise steadily over 2 days since this would underestimate inflow into the study area, a more conservative scenario, than if it rose one and one half feet the first day and one half feet the second day. The assumptions from Reference 1 were verified by examining stage data for Copperas Creek for the period 1990 through 1995.

Each point on the stage hydrograph was converted to a discharge value using a rating curve for the flow corridor. A HEC-RAS model was used to produce the rating curves for each segment. Each segment was composed of 10 cross sections and extended in length about 1,500 feet from the edge of the Illinois River toward the edge of Goose Lake. Information for the segments is summarized in table G-5. The width of the total flow path from Illinois River to Goose Lake is 10,500 feet (RM 133 to about RM 135.2). Senate Island was included as part of the flow path in segments 56, 67, and 78.

Table G-5. Information on Segments of Overland Flow

Segment	Flow Width (feet)	Approximate Illinois RM of Flow Path	Min. Max. Ground Elevation Along Illinois River
89	2,520	133 to 133.5	440-440.5
78	2,400	133.5 to 134	440-442
67	2,200	134 to 134.5	442-442
56	3,400	134.5 to 135.2	442-442

A Manning's n-value of 0.11 was used for the cross sections to simulate water flowing through dense woods. The water surface profiles were started at normal depth using the slope between the first two cross sections. The cross section with the highest ground elevations was at the bank of the river. High ground elevations for the segments varied between elevation 440.0 feet and 442.0 feet. Rating curves for the four segments and total appear in the figure on Plate G-21.

2. Maximum Interior Water Level Using the Overland Flow Corridor. The final interior water level of elevation 437 feet was computed using the elevation volume table shown in Table G-6. Computations started with an interior water elevation of 434.0 feet. The discharge hydrograph was entered at one-hour intervals. . The elevation-area-volume data were taken from Reference 1 (table 4-1). The areas (and volumes) used in the model appear in table G-6.

Table G-6. Elevation-Area Data Used in Overland Flow Corridor Model

Elevation (feet)	Surface Area (acres)	Storage Volume (acres-feet)
434.0	1,220	0
434.5	1,450	667
435.0	1,650	1,443
435.5	1,790	2,302
436.0	1,920	3,230
437.0	2,070	5,225
438.0	2,195	7,358
439.0	2,326	9,618

Several existing features separate the combined area of Goose Lake, Big Lake, Lower Slim Lake, and the Duck Island Gravel Pit from the Rice Lake area. These features include high ground and the Narrows Dam. When the water level in Big Lake exceeds elevation 439.0 feet, it will start entering Rice Lake. Since the overland flow corridor routings produced interior water levels below elevation 439.0 feet, the area of Rice Lake was not included in this model. A few of the Big Lake management units were inadvertently omitted. However, since the combined area of the management units is less than 10 percent of the area of Big, Goose, and Lower Slim Lakes, this oversight was not revised.

VI. LOWERING PROJECT LAKE LEVELS IN JUNE

A. Operation Criteria and Description of the Three Alternatives. In this section, the term *Big Lake Complex* refers to Big Lake, Goose Lake, Upper Slim Lake, and adjacent moist soil units. The operating plan calls for lowering the water levels of Big Lake Complex and Rice Lake in 21 days. Drawdown will occur in June and be complete in July to allow for a moist soil plant growing season from July to September 15. Under normal operating conditions Big Lake Complex water surface elevation is 436.0 feet and Rice Lake at elevation 437.0 feet. Big Lake Complex will be drawn down to elevation 434.0 feet and Rice Lake to elevation 435.0 feet.

The Big Lake Complex is currently lowered through Goose Lake by removing the stoplogs of two existing stoplog structures (see Plate 9 of main report) when Illinois River stages are favorable. Each stoplog structure is a corrugated metal pipe (CMP) culvert with a diameter of five feet, a length of about 40 feet, and an invert elevation estimated at 431.3 feet. A dirt channel connects the culverts to Goose Lake. With the existing configuration, model results give a drawdown duration of 27.0 days for Big Lake Complex and Rice Lake given a river stage, or tailwater (TW) elevation, of 434.0 feet.

Therefore, to meet the drawdown criteria outlined in the first paragraph of this section, the outflow capacity must be increased. Three alternatives were examined. **Alternative 1** adds the proposed fish egress structure parallel to the two existing stoplog structures. **Alternative 2** consists of adding the proposed fish egress structure parallel to the two existing stoplog structures and an additional gatewell structure. The additional gatewell structure has a diameter of five feet, a length of about 100 feet, and an invert at elevation 430.0 feet. The fish egress structure is a nine foot by seven foot concrete box culvert, 26 feet long, with invert elevation 430.0 feet. **Alternative 3** abandons the existing gatewells and uses only the new gatewell and fish egress structure for drawdown. Alternative 2 was selected since it provides the most flexibility of operation. Furthermore, scour protection will be required at the inlets and outlets of the proposed gatewell and fish egress structures to prevent erosion. Drawdown analysis of the three alternatives is described in the following section.

B. Evaluation of Alternatives. Historic data was studied to gain an insight into project operation. Table G-7 shows the maximum, minimum, and average Illinois River stage during the proposed drawdown period in June observed at Copperas Creek for selected years (1960 to 2008). The drawdown period for this analysis was selected by taking the lowest average river stage for 15 consecutive days in June. Table G-7 also presents the tailwater (TW) impact on drawdown; the maximum river stage in May; the approximate lake volume in May; the minimum possible drawdown

elevation for partial drawdowns; and if the drawdown process will be a success. As mentioned earlier in this appendix, the project does not operate successfully every year. With the proposed overflow spillway at elevation 440.0 feet, there were 28 out of 49 years when the spillway would not have been overtopped later in the growing season July 1 to September 15). These 28 years furnished conditions for evaluating the two alternatives during the drawdown period. Success of drawdown was determined based on average river stage being at or below 434.0 feet. However, one drawdown (1966) was considered successful due to low river stages, which allow for faster drawdown, even though the average stage was slightly above 434.0 feet.

Complete drawdown of the lakes (Rice Lake and Big Lake Complex) would have been impossible eight of the 28 years the site is not flooded later in the growing season because the Illinois River remained above elevation 436.0 feet (1980, 1984, 1995, 1997, 1999, 2001, 2002, and 2004). Partial drawdown, average river stage between 434.0 feet and 436.0 feet, would have been possible three years (1969, 1983, and 1991). Of the remaining 17 years, 12 occurred with a tailwater at or below 433.0 feet and five occurred with a tailwater of about 434.0 feet. Complete success (complete drawdown of the lakes and no overtopping of the spillway later in the growing season) would have been possible 17 of the 49 years. This gives a "with-project" success rate of 35 percent, or about four out of every 10 years. Without the project, the lakes (Rice Lake and Big Lake Complex) could have been successfully managed (complete drawdown and no flooding later) only five years. This gives a "without-project" success rate of 10 percent, or one out of every 10 years.

Table G-7. Stage Data at Copperas Creek and Lake Drawdown Data for June

	Ignore Year If Project Floods Later in Growing Season	Max. May Stage	Illinois River During Drawdown		Drawdown Avg. Stage	TW Impact On Drawdown	Approx Lake Vol.- May	Drawdown Success	Min. Possible Drawdown Elev.
			Max. Stage	Min. Stage					
Year									
1960	Ignore	--	--	--	--	--	--	--	--
1961		439.4	435.0	432.1	433.1	Fast	Min	YES	--
1962		439.8	437.6	431.5	433.9	Fast	Min	YES	--
1963		436.9	432.0	430.8	431.3	Fast	Min	YES	--
1964		439.2	431.3	430.6	430.9	Fast	Min	YES	--
1965		443.5	432.8	431.0	431.7	Fast	Max	YES	--
1966		444.6	436.6	432.4	434.4	Fast	Max	YES	--
1967		441.6	437.2	432.8	434.0	Fast	Max	YES	--
1968	Ignore	--	--	--	--	--	--	--	--
1969		440.5	438.4	434.1	435.9	Slow	Max	Partial	434-435
1970	Ignore	--	--	--	--	--	--	--	--
1971		434	432.7	431.6	431.6	Fast	Min	YES	--
1972	Ignore	--	--	--	--	--	--	--	--
1973	Ignore	--	--	--	--	--	--	--	--
1974	Ignore	--	--	--	--	--	--	--	--
1975	Ignore	--	--	--	--	--	--	--	--
1976		442.9	434.2	433.2	433.8	Fast	Max	YES	--
1977		438.7	431.8	429.9	430.9	Fast	Min	YES	--
1978	Ignore	--	--	--	--	--	--	--	--
1979	Ignore	--	--	--	--	--	--	--	--
1980		439.1	443.8	438.0	440.9	Slow	Min	Fails	--
1981	Ignore	--	--	--	--	--	--	--	--
1982	Ignore	--	--	--	--	--	--	--	--
1983		446.4	437.2	433.9	435.5	Slow	Max	Partial	434-435

Year	Ignore Year if Project Floods Later in Growing Season	Max. May Stage	Illinois River During Drawdown		Drawdown Avg. Stage	TW Impact On Drawdown	Approx Lake Vol.- May	Drawdown Success	Min. Possible Drawdown Elev.
			Max. Stage	Min. Stage					
1984		440.0	441.6	437.7	439.5	Slow	Max	Fails	--
1985		438.9	432.9	431.8	432.3	Fast	Min	YES	--
1986	Ignore	--	--	--	--	--	--	--	--
1987		439.6	433.9	432.4	433.3	Slow	Min	Yes	--
1988		436.9	430.6	430.3	430.4	Fast	Min	YES	--
1989	Ignore	--	--	--	--	--	--	--	--
1990	Ignore	--	--	--	--	--	--	--	--
1991		443.4	438.9	432.0	434.7	Slow	Max	Partial	434-435
1992		437.2	432.7	430.9	431.4	Fast	Min	YES	--
1993	Ignore	--	--	--	--	--	--	--	--
1994		440.3	432.4	431.5	431.9	Fast	Max	YES	--
1995		451.7	443.4	438.1	440.2	Slow	Max	Fails	--
1996	Ignore	--	--	--	--	--	--	--	--
1997		437.2	439.1	434.5	437.2	Slow	Min	Fails	--
1998	Ignore	--	--	--	--	--	--	--	--
1999		445.1	441.2	439.7	440.3	Slow	Max	Fails	--
2000	Ignore	--	--	--	--	--	--	--	--
2001		437.9	443.0	435.6	440.5	Slow	Min	Fails	--
2002		451.1	442.8	438.6	441.0	Slow	Max	Fails	--
2003	Ignore	--	--	--	--	--	--	--	--
2004		440.5	443.8	440.3	442.6	Slow	Max	Fails	--
2005		435.0	431.7	430.0	430.8	Fast	Min	YES	--
2006		437.6	433.9	431.2	432.1	Fast	Min	YES	--
2007	Ignore	--	--	--	--	--	--	--	--
2008	Ignore	--	--	--	--	--	--	--	--

1. Description of HEC-HMS models. The volume-elevation data used in the HEC-HMS models appears in table G-8 and was generated using Crawford, Murphy, and Tilly (CMT) data. Two adjustments were made to the data: (1) the volume between elevations 435.0 feet to 434.0 feet only includes the volume of Big Lake Complex since Rice Lake is not drained below 435.0 feet; and (2) under normal operating conditions the volume drained from elevation 437.0 feet to 436.0 feet will include only Rice Lake since Big Lake Complex's water surface will not be above 436.0 feet. When the connection between Big Lake and Rice Lake is unblocked before starting the drawdown operation, the water level of both lakes will equalize at elevation 436.4 feet. This elevation was used as the starting water level for the normal operating condition. The second volume adjustment was ignored when computing the volumes above elevation 437.0 feet since Big Lake Complex will be at the same level as Rice Lake. The outflow-elevation data for each alternative was computed with HEC-RAS and appears in table G-8. Two rating curves were generated for each alternative, one with a tailwater elevation of 434.0 feet and another with a tailwater elevation of 433.0 feet. It is important to note the outflows for lake levels below 434.0 feet were set to zero because the lake level will not be drawn down below 434.0 feet.

Table G-8. HEC-HMS Routing for Proposed Alternatives

		Alternative 1		**Alternative 2**		**Alternative 3**	
Lake Elevation (feet)	Total Lake Volume (acre-feet)	Outflow TW=434 feet (cfs)	Outflow TW=433 feet (cfs)	Outflow TW=434 feet (cfs)	Outflow TW=433 feet (cfs)	Outflow TW=434 feet (cfs)	Outflow TW=433 feet (cfs)
433.9	0	0	0	0	0	0	0
434.0	1	0	234	0	302	0	232
434.1	122	104	246	124	317	100	243
435.0	1,451	343	360	430	459	316	340
436.0	4,459	497	497	621	627	440	445
436.4	5,706	554	554	690	693	484	487
437.0	7,822	640	640	793	795	549	552
438.0	11,523	779	779	954	955	661	660
439.0	15,726	911	911	1,108	1,108	764	763
440.0	20,630	1,012	1,012	1,218	1,218	879	879

2. Results from HEC-RAS and HEC-HMS Models to Drawdown Lakes in June. Drawdown times for the lakes were calculated using modified Puls routing in HEC-HMS based on the outflow-elevation data derived from the HEC-RAS model. Model results indicate all alternatives can meet the drawdown criteria for normal operating conditions. However, Alternative 2 drains the lakes in seven to nine days under normal operating conditions and can meet the drawdown criteria when lake levels are higher than normal as shown in table G-9. Normal operating condition refers to Big Lake Complex and Rice Lake starting at elevation 436.0 feet at 437.0 feet, respectively. This case was simulated by starting both lakes at elevation 436.4 feet and using a half hour computation interval. Drawdown times were rounded to the nearest half-day. Alternative 2 is recommended due to its flexibility of operation.

Table G-9. Days Required to Drawdown Big Lake Complex and Rice Lake

	Alternative 1		Alternative 2		Alternative 3	
Initial Lake Level (feet)	TW= 434 ft (days)	TW= 433 ft (days)	TW= 434 ft (days)	TW = 433 ft (days)	TW= 434 ft (days)	TW = 433 ft (days)
439.0	18.0	15.0	14.5	15.5	20.0	17.0
438.0	15.5	12.5	12.5	10.5	17.0	14.0
437.0	13.0	10.0	10.5	8.0	14.0	11.0
Normal (436.4)	11.0	8.5	9.0	7.0	12.0	9.0

VII. MAINTENANCE CONCERNS

Most of the Corps of Engineers guidance leads one to conclude that if the interior water level is within one foot of the levee crest at the time of overtopping, the levee damage will be slight. However, the guidance for overtopping grass levees comes from observations and experiments on levees that rarely overtopped. The Rice Lake Project levee/spillway could be overtopped several times a year.

Riprap armor guidance for the spillway comes from hydraulic modeling conducted at the Waterway Experiment Station (Reference 6). The design curves allow only a small water level difference (two feet to seven feet) across the levee and result in large stone sizes (300 to 3,000 pounds).

Levees providing low levels of protection will have high maintenance costs. Based upon observations of the spillway at Lake Chautauqua, trees and debris will collect on the spillway every time it is overtopped. If the Rice Lake Project is protected with riprap, the debris must **not** be burned in place since the fire would damage the riprap. Equipment and labor would be required to remove debris from the spillway. To quantify these events, the stage at Copperas Creek was examined for the 49 years from 1960-2008; a count was made of the number of times per year the spillway would have been overtopped. No stage adjustments were made to the Copperas Creek data. As shown in table G-10, in 49 years there would have been 126 opportunities for debris to collect on the spillway.

Table G-10. Summary of Opportunities for Debris to Collect at Rice Lake (1960 - 2008)

Description	**Spillway Crest - 440 feet**
Number of years when spillway would not be overtopped (no debris possible)	2
Number of years when spillway would be overtopped once during the year (debris possible from 1 event)	6
Number of years when spillway would be overtopped twice during the year (debris possible from 2 events)	19
Number of years when spillway would be overtopped 3 times during the year (debris possible from 3 events)	11
Number of years when spillway would be overtopped 4 times during the year (debris possible from 4 events)	7
Number of years when spillway would be overtopped 5 times during the year (debris possible from 5 events)	3
Number of years when spillway would be overtopped 6 times during the year (debris possible from 6 events)	1

VIII. INFLUENCE OF PROJECT ON WATER SURFACE LEVELS IN THE ILLINOIS RIVER

Analysis was performed on a previous design with a higher level of protection (442.0 ft) than the recommended plan. The previous analysis found the levee/spillway has a maximum influence on water levels in the Illinois River for a discharge of 34,000 cfs which has a recurrence interval of less than two years. Although the project is within the floodway of the Illinois River the impacts are minimal and were coordinated with the Illinois Department of Natural Resources in 1998. See Plates G-22 and G-23 for a copy of the 1998 letter.

IX. REFERENCES

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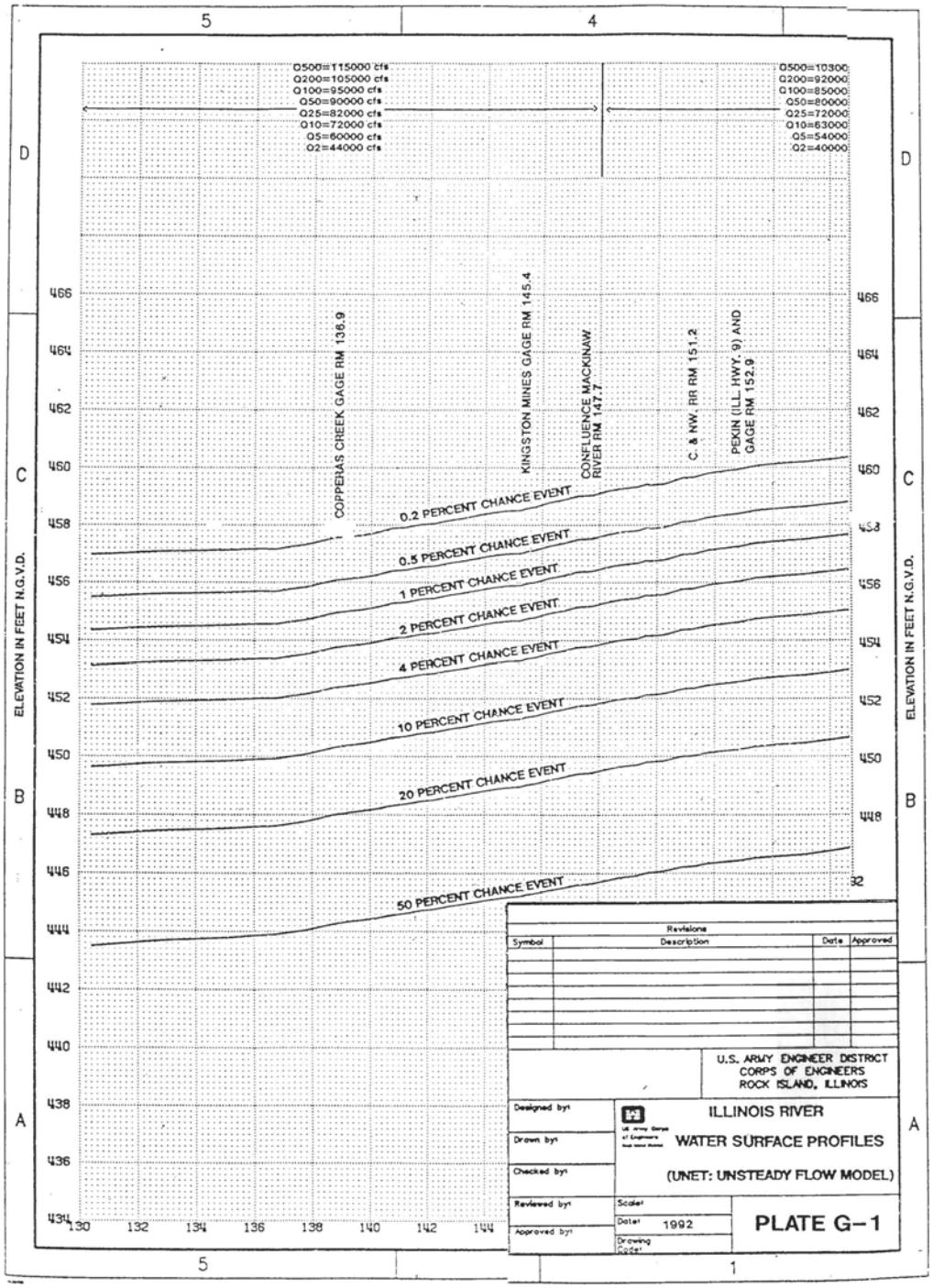
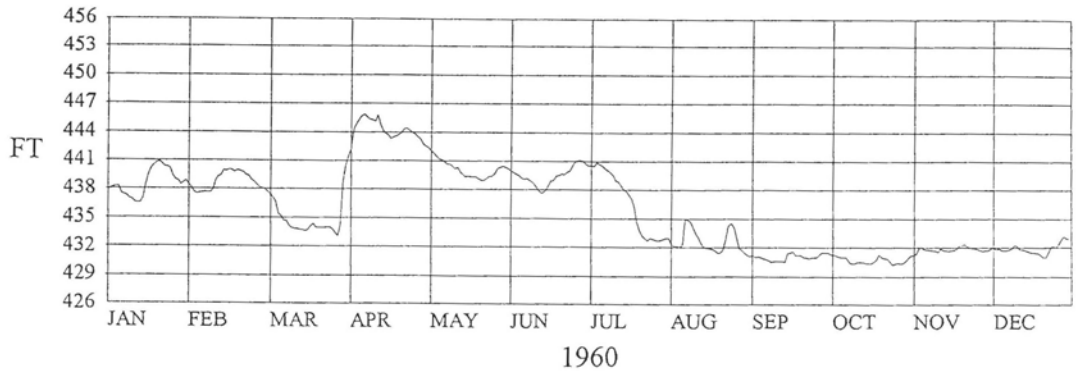
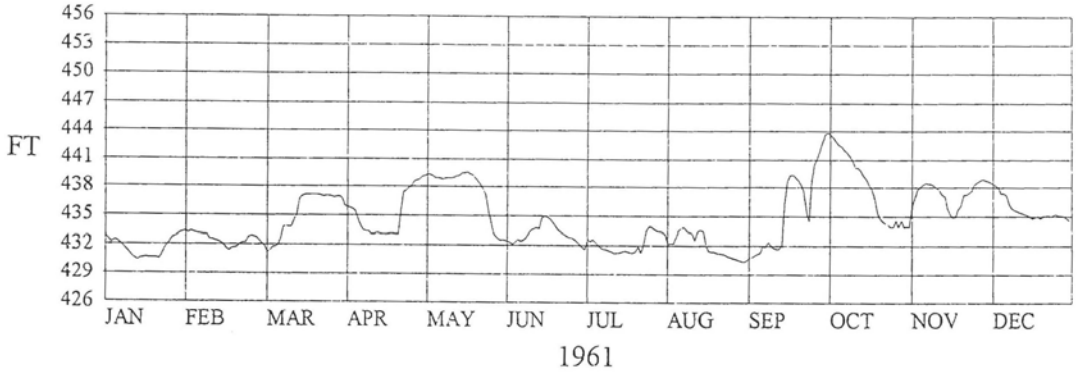
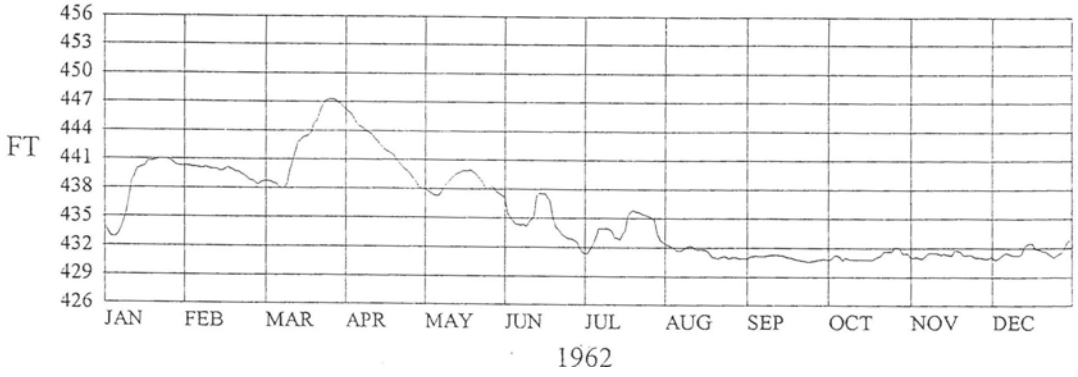


Illinois River Water Surface Profiles

PLATE G-1

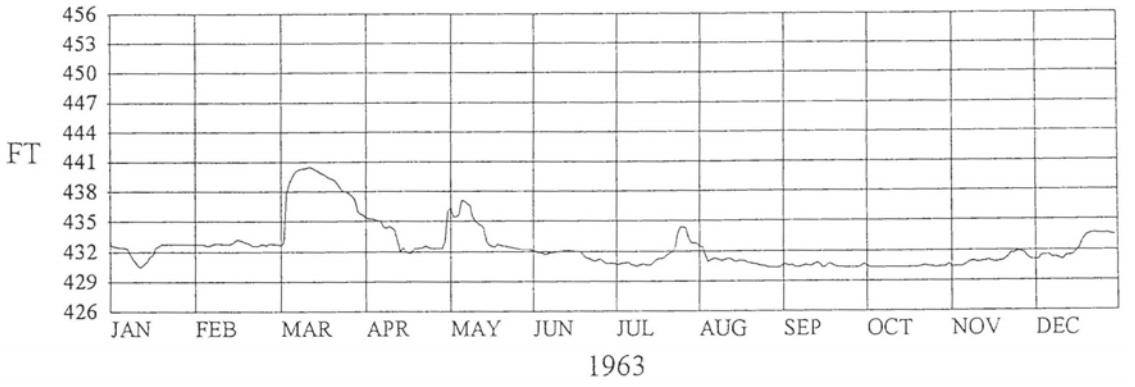


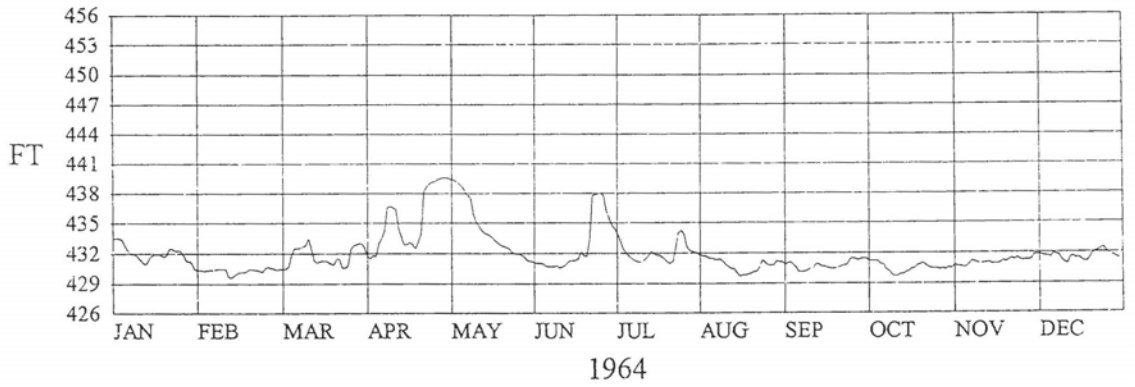


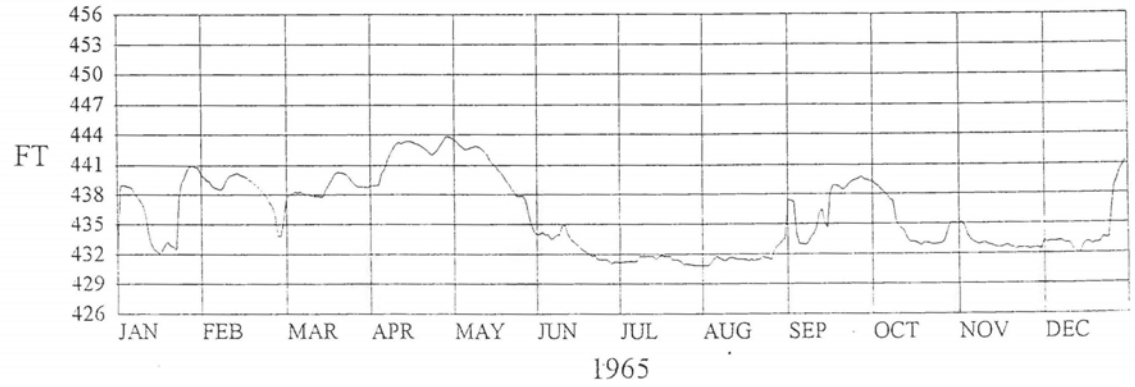


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-2

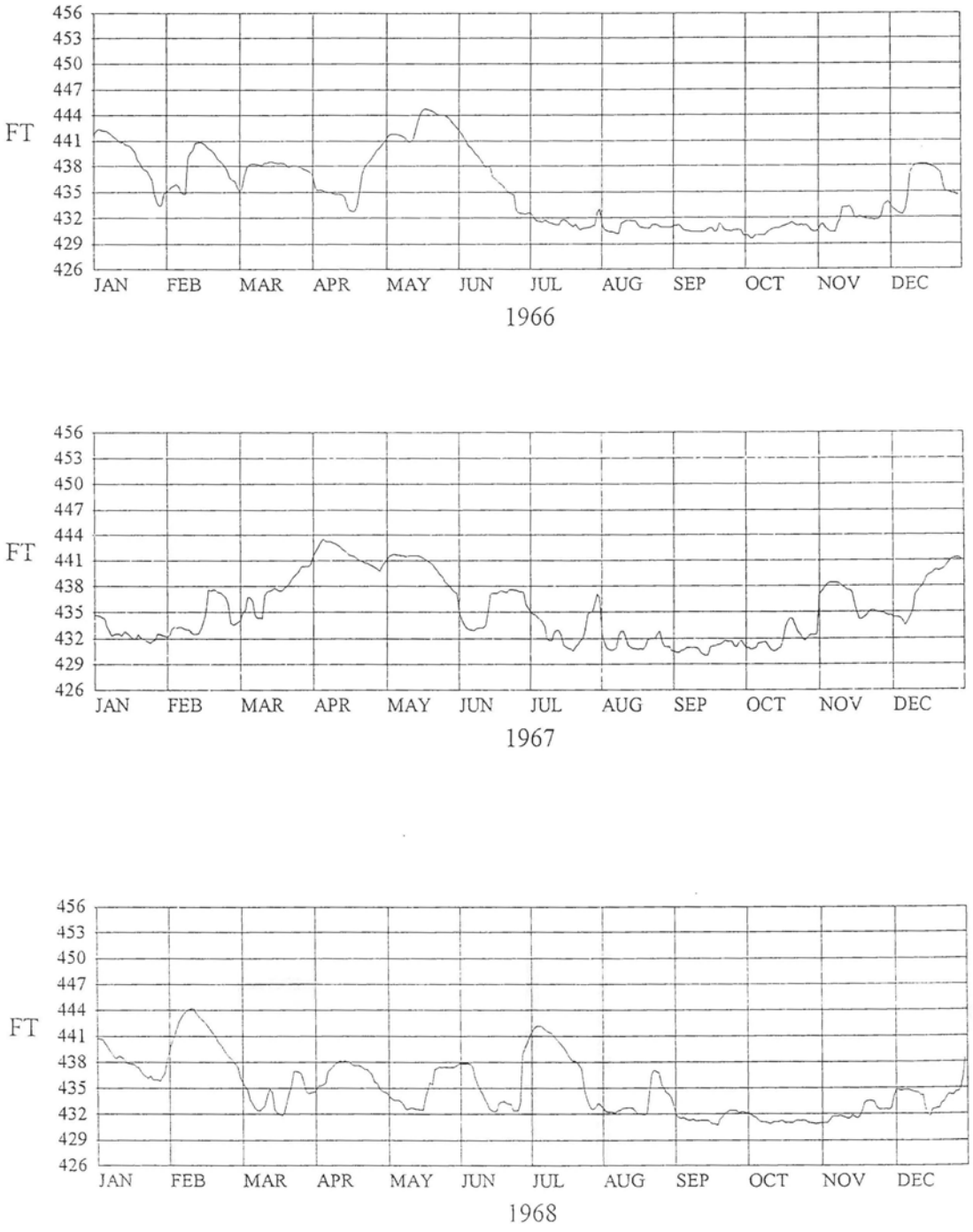






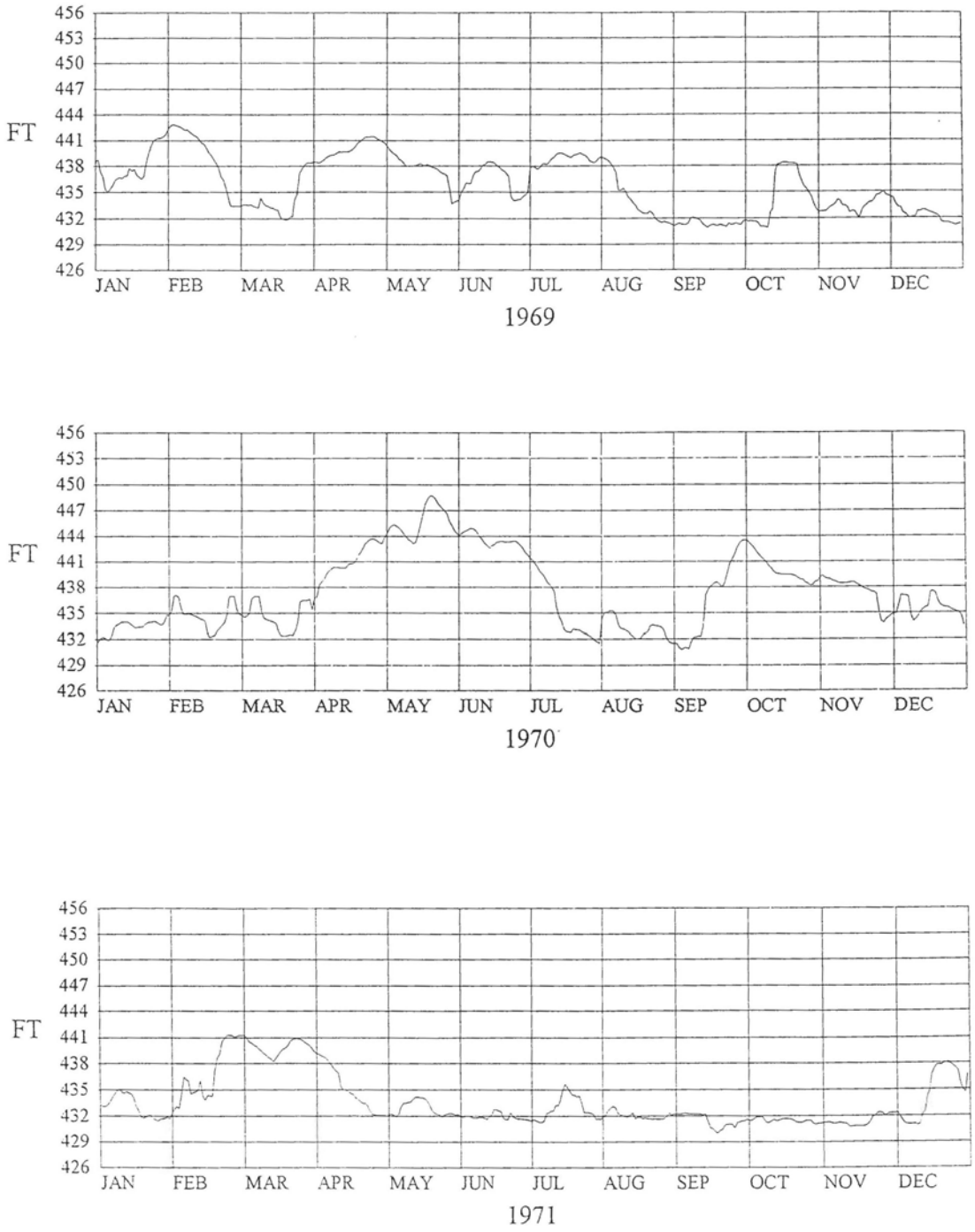
Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-3



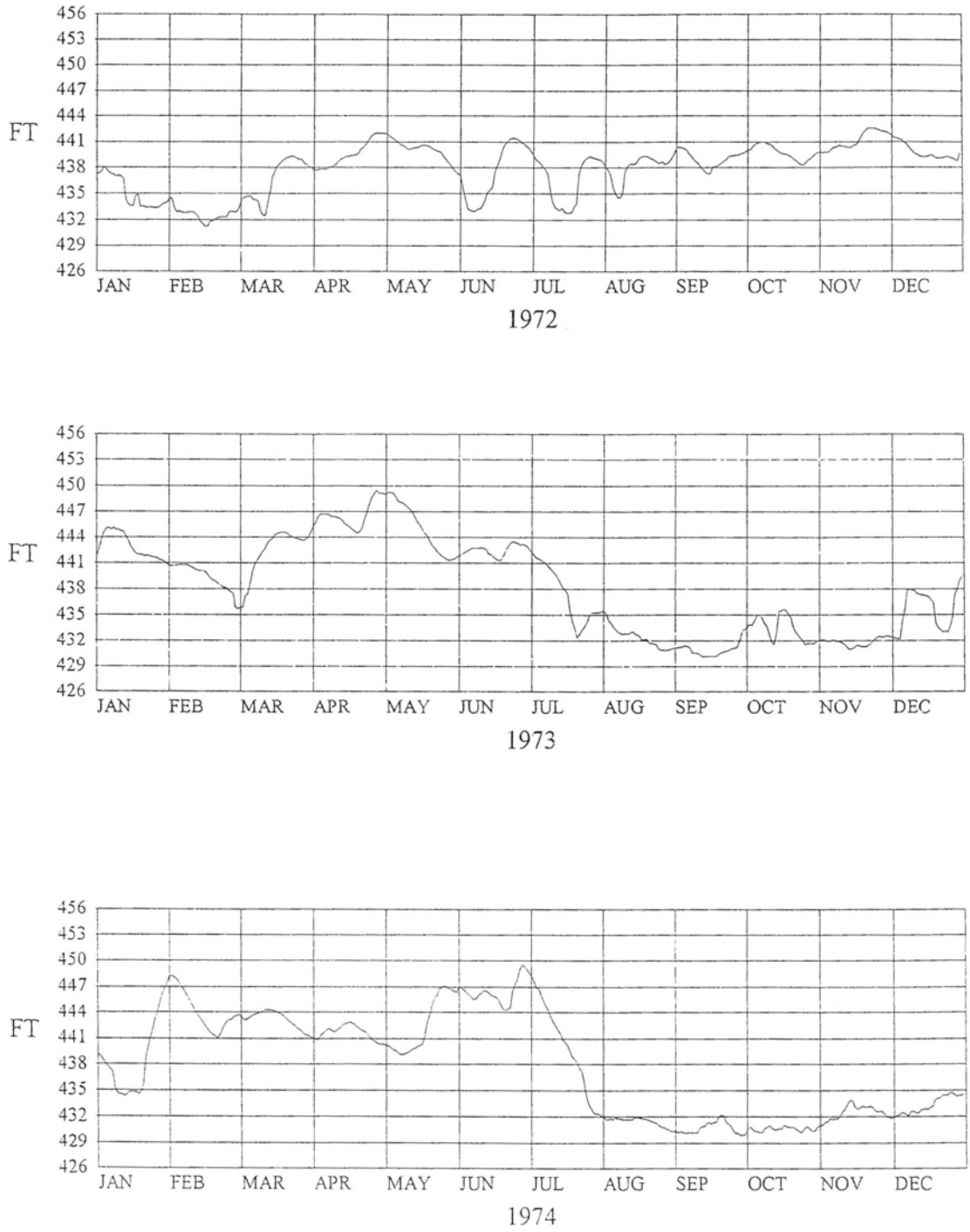
Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-4



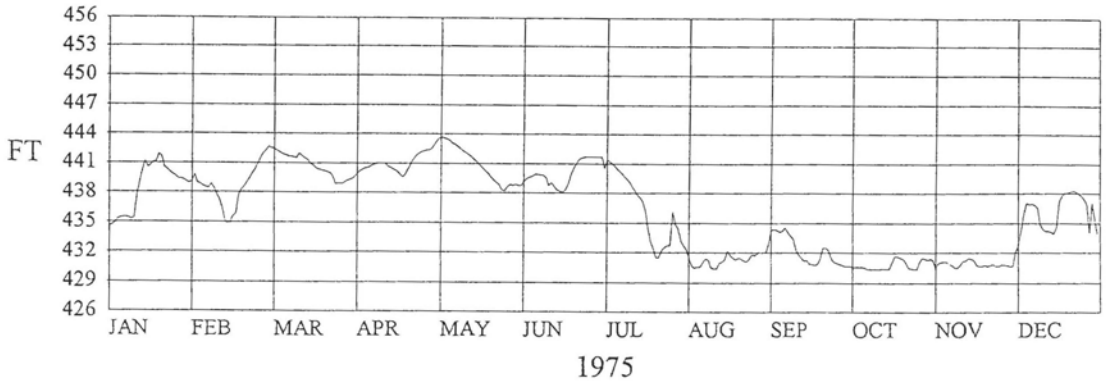
Illinois River Stage Hydrographs at Copperas Creek by Year

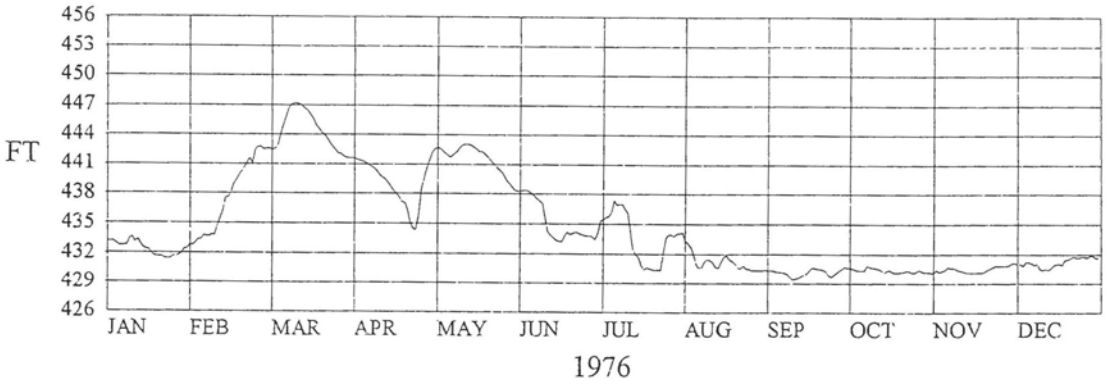
PLATE G-5

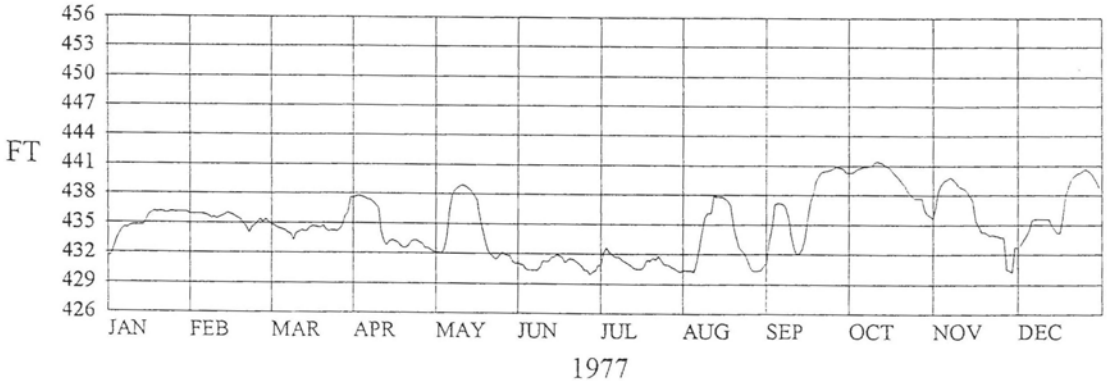


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-6

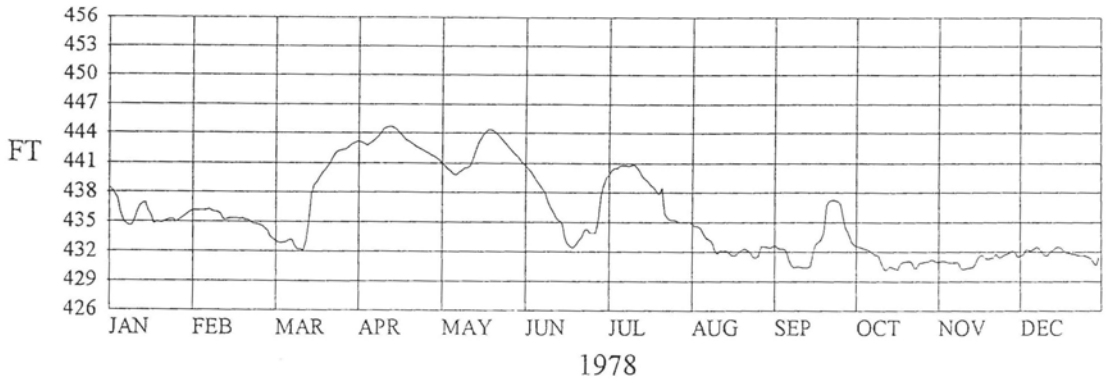


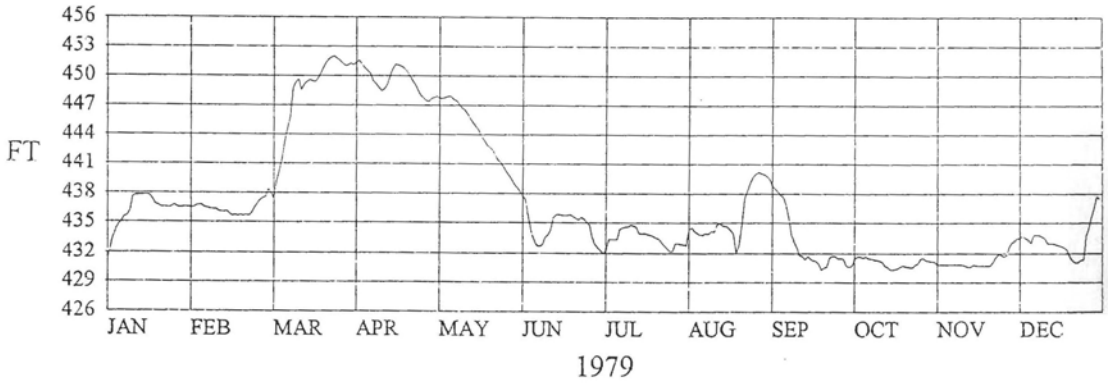


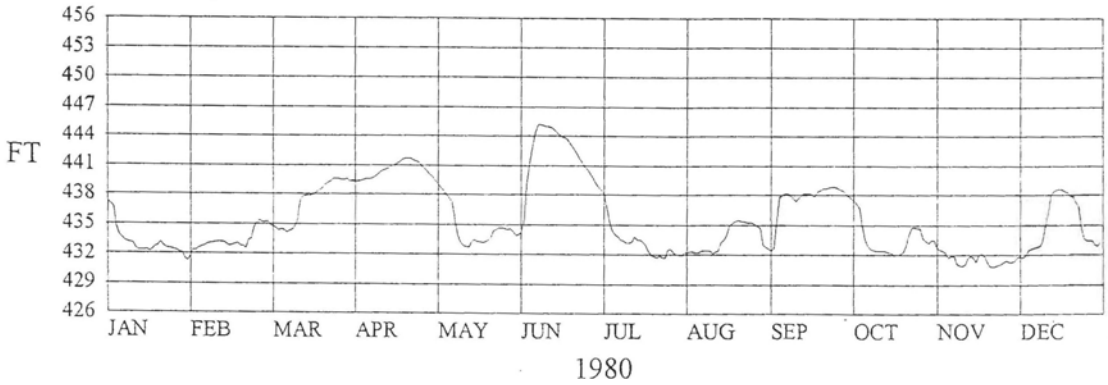


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-7

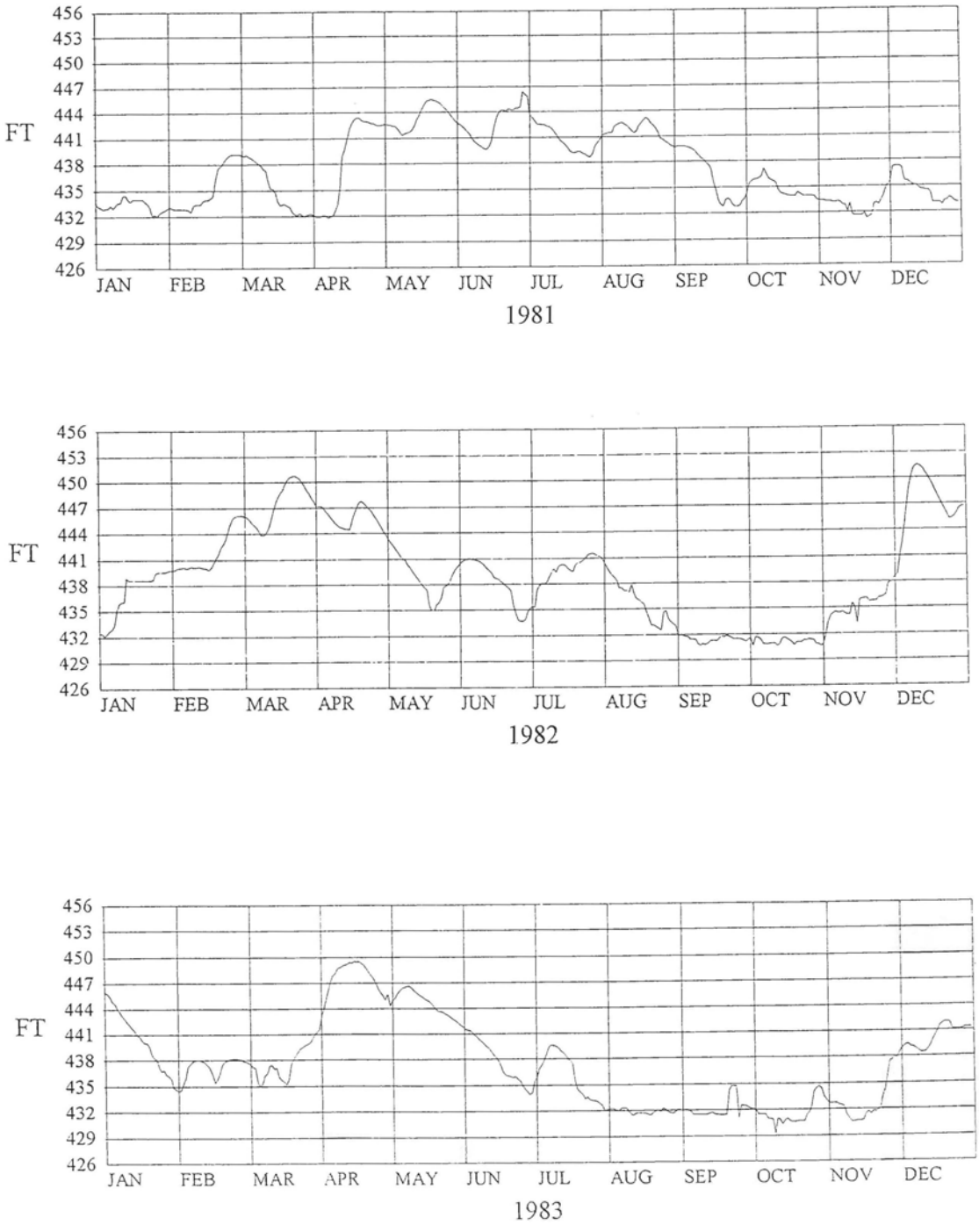






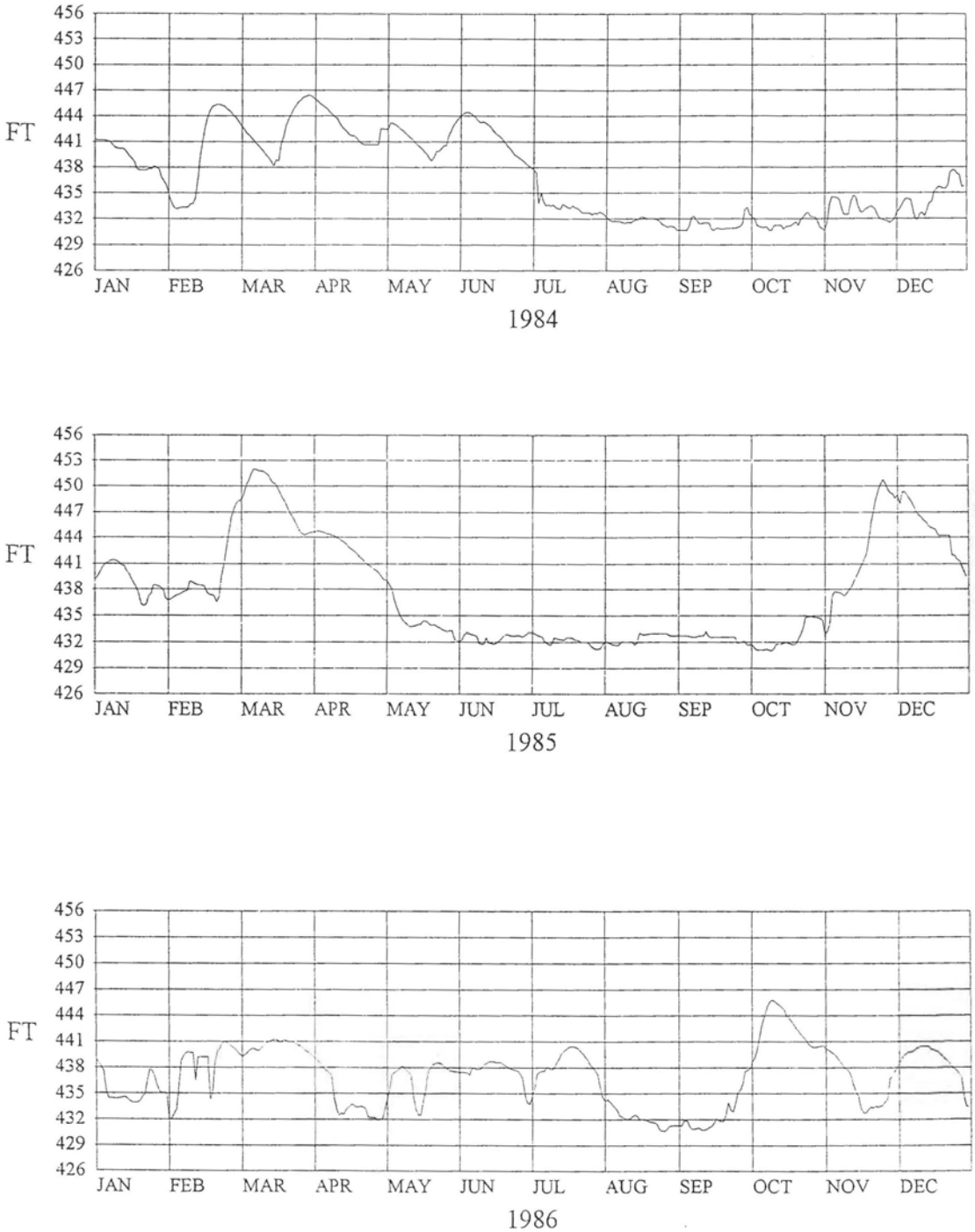
Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-8



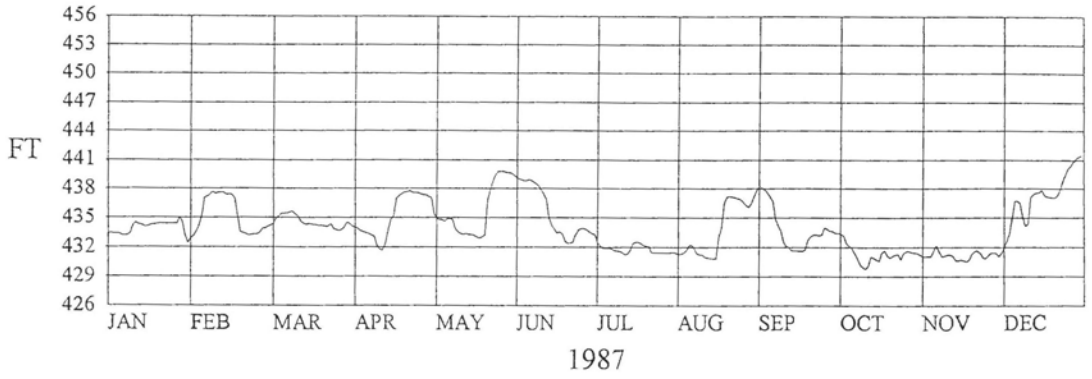
Illinois River Stage Hydrographs at Copperas Creek by Year

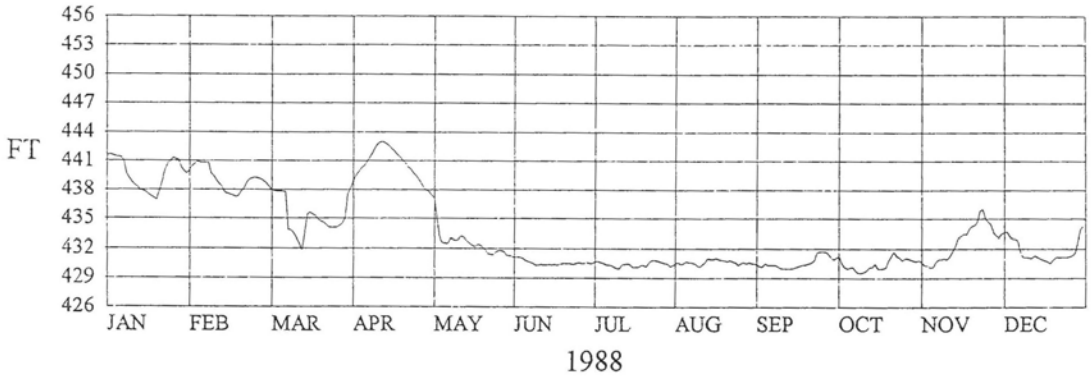
PLATE G-9

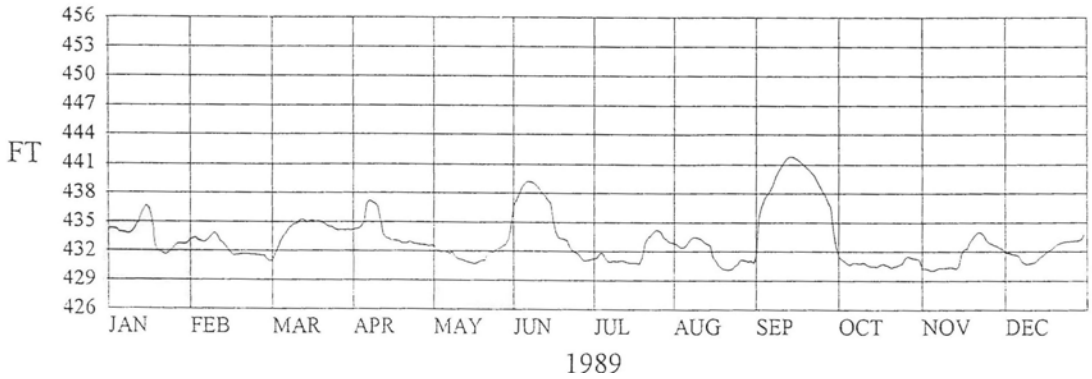


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-10

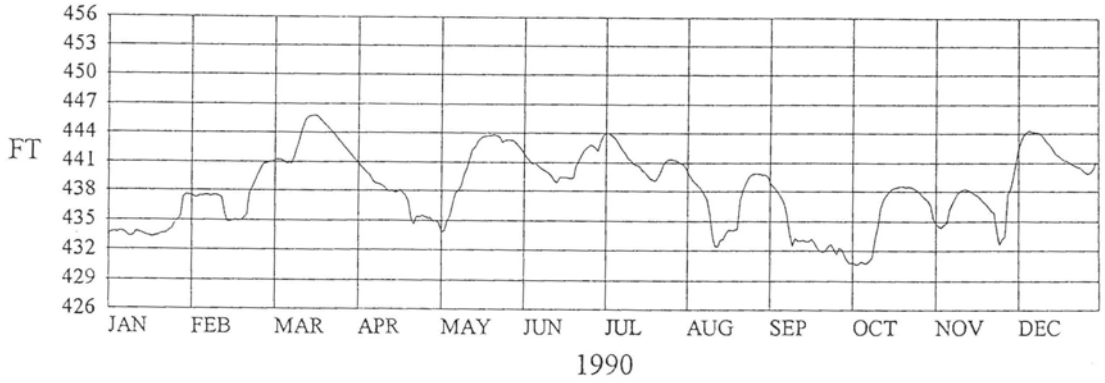


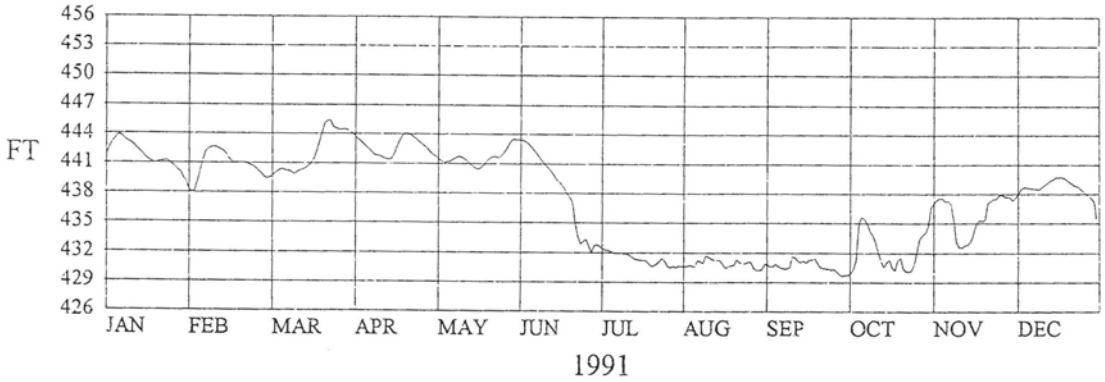


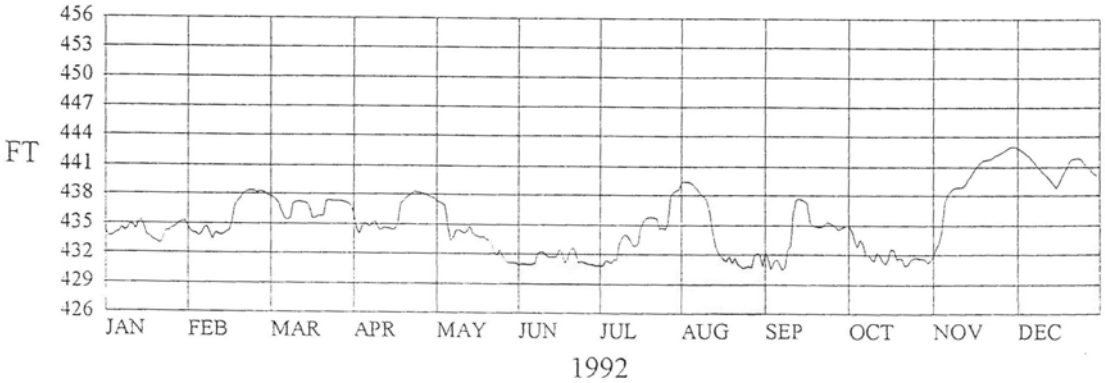


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-11

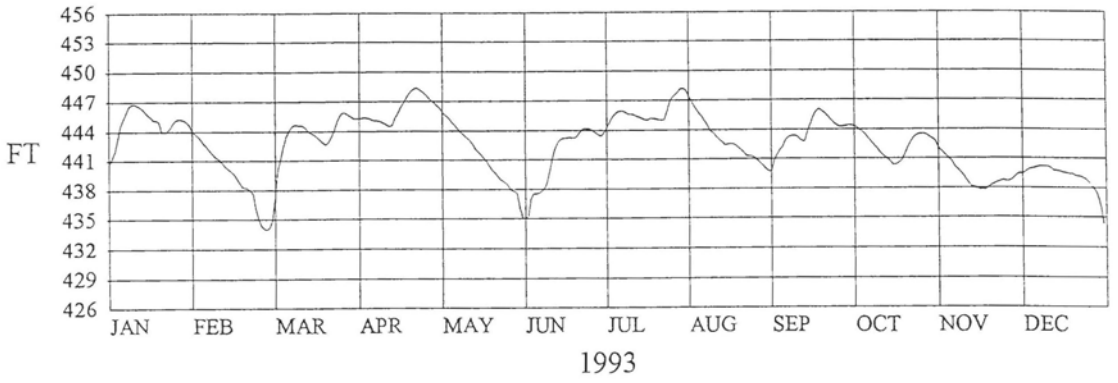


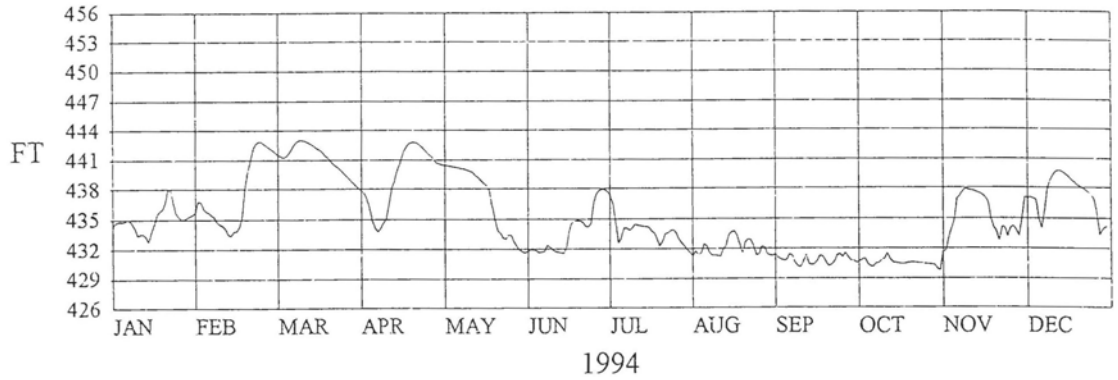


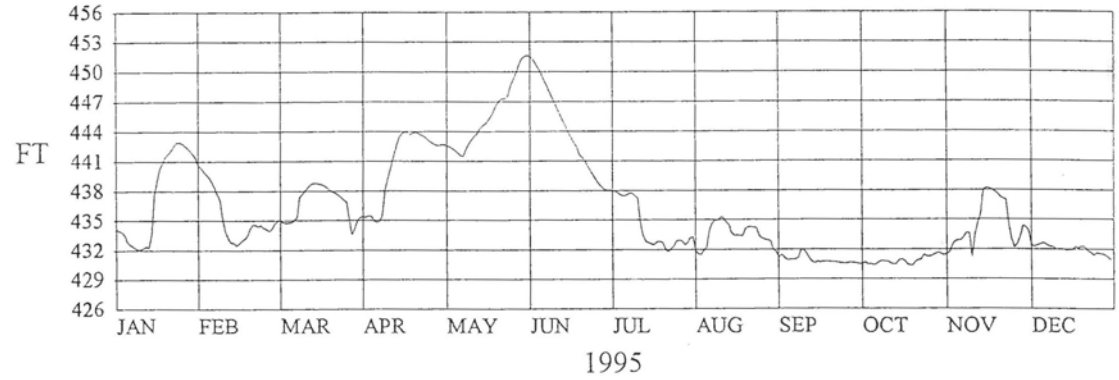


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-12

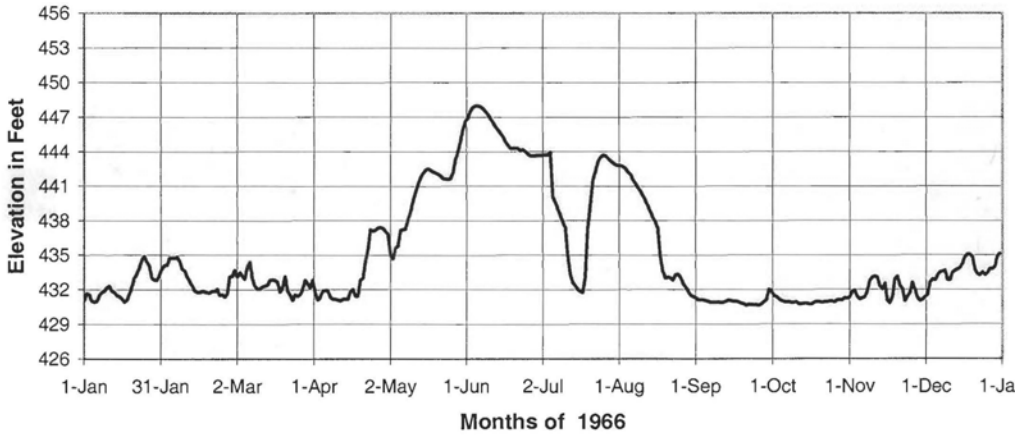


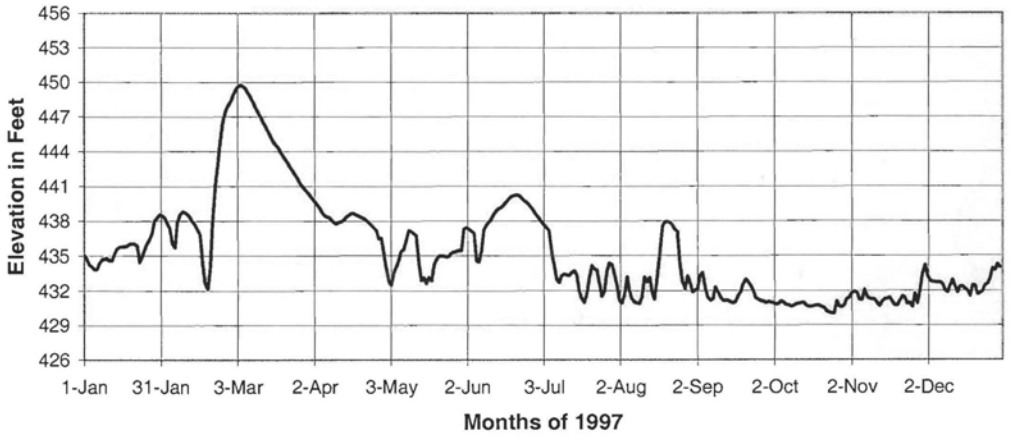


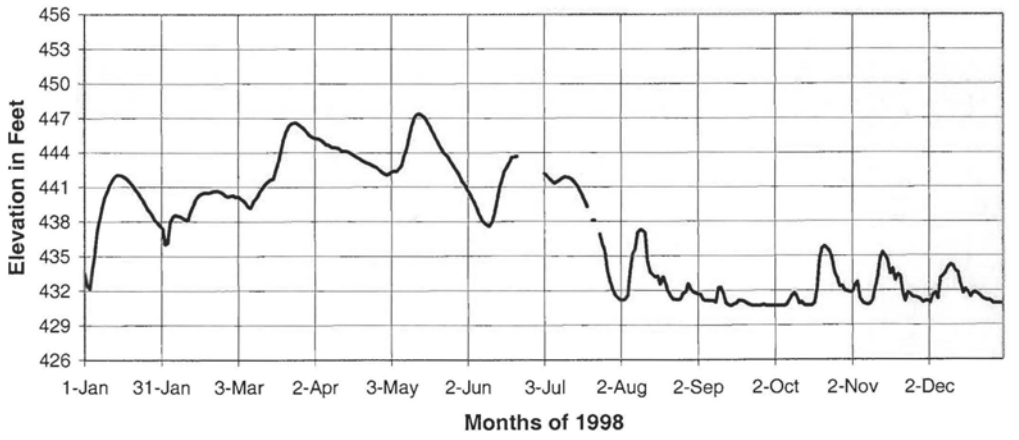


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-13

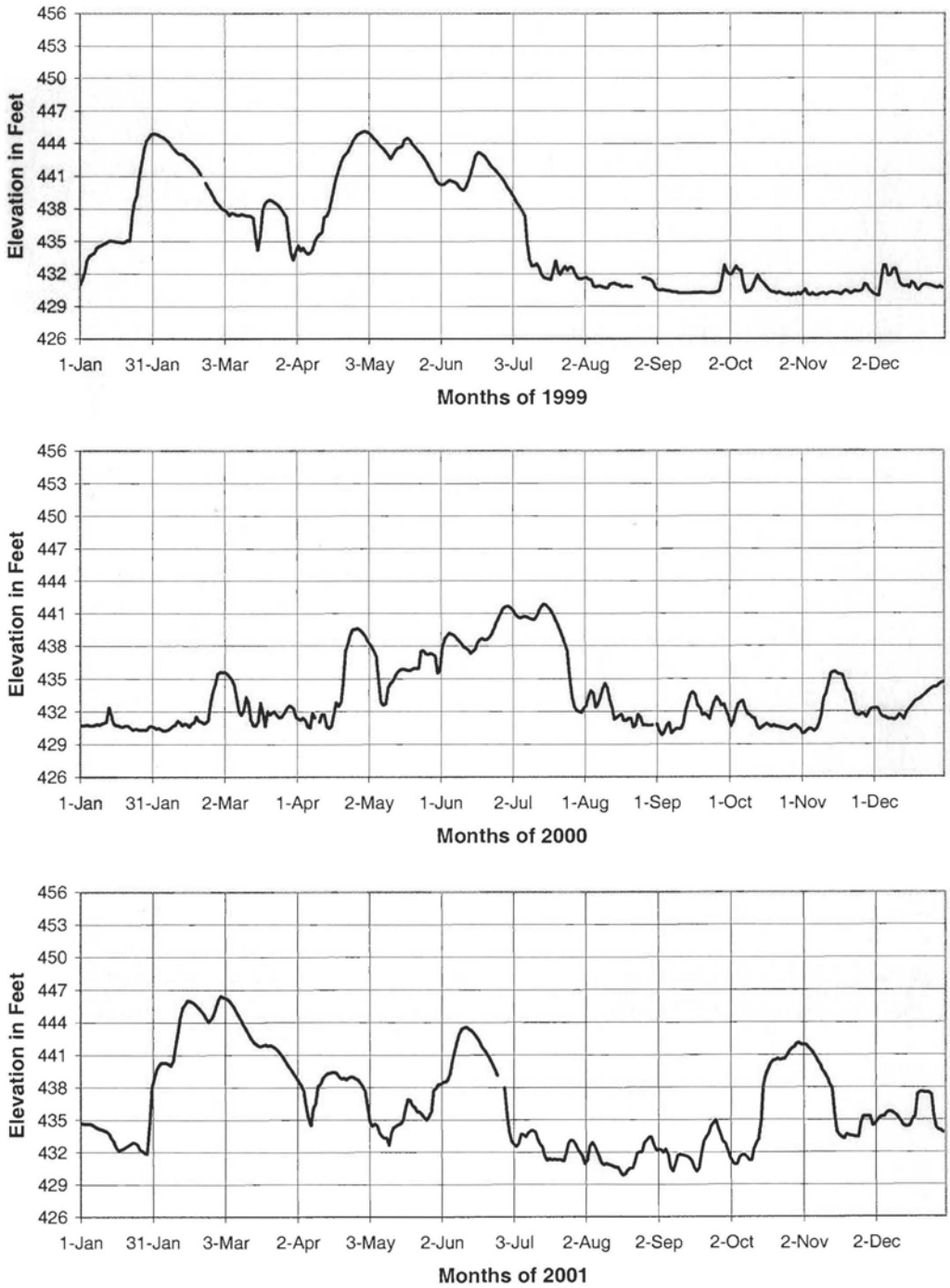






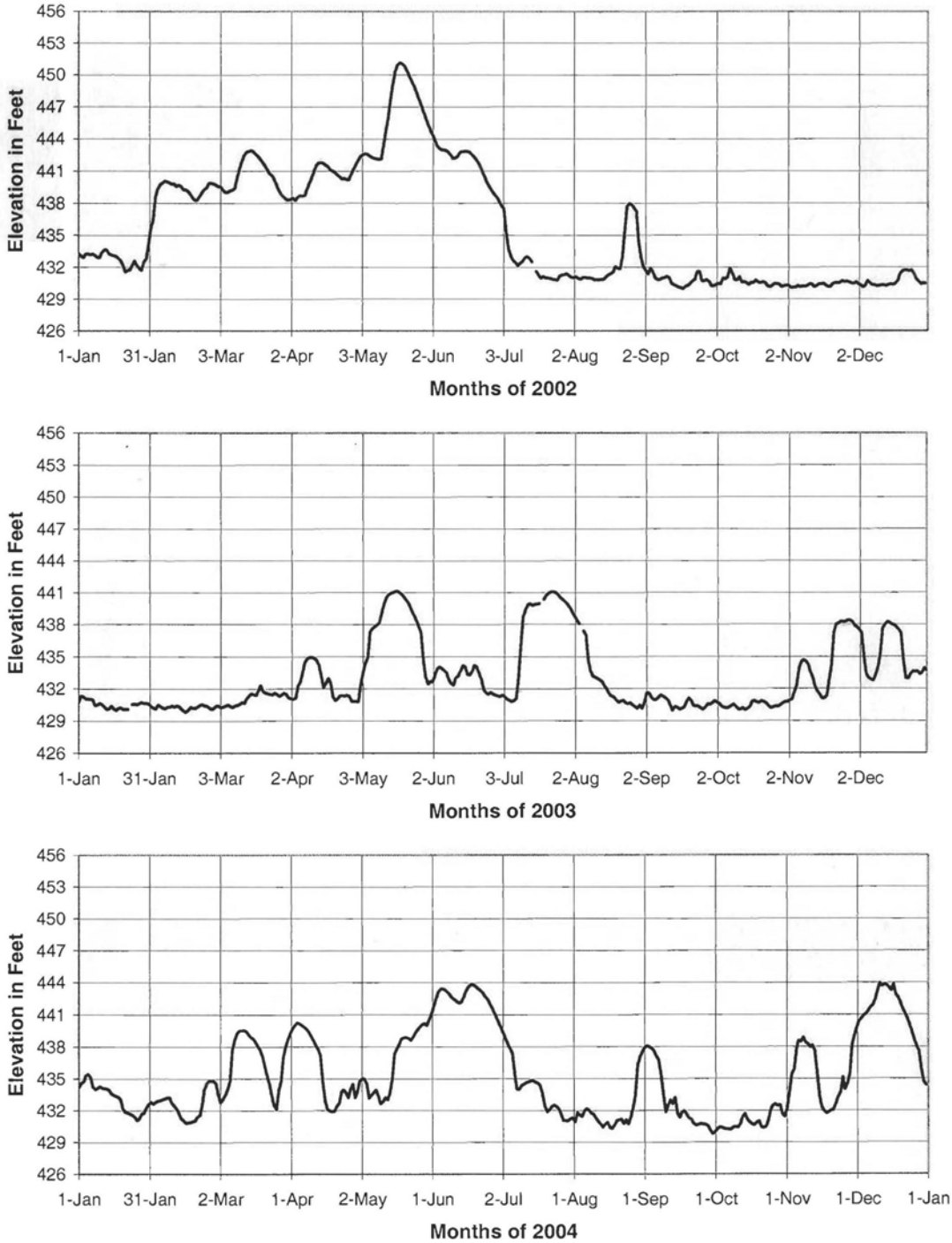
Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-14



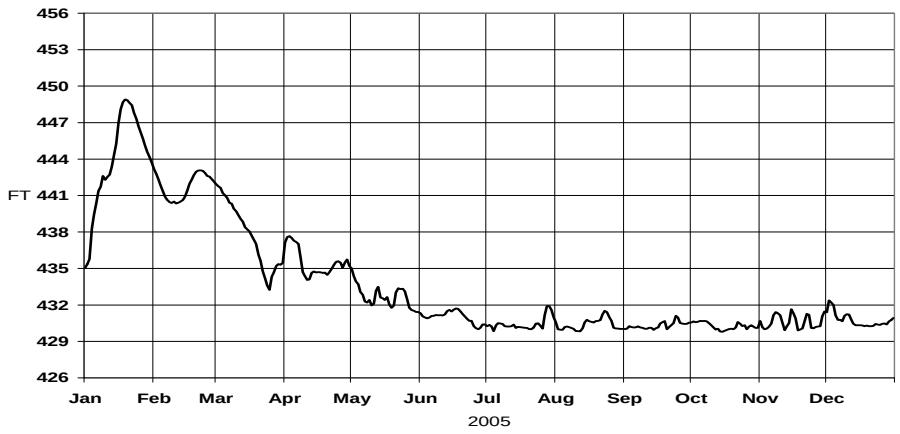
Illinois River Stage Hydrographs at Copperas Creek by Year

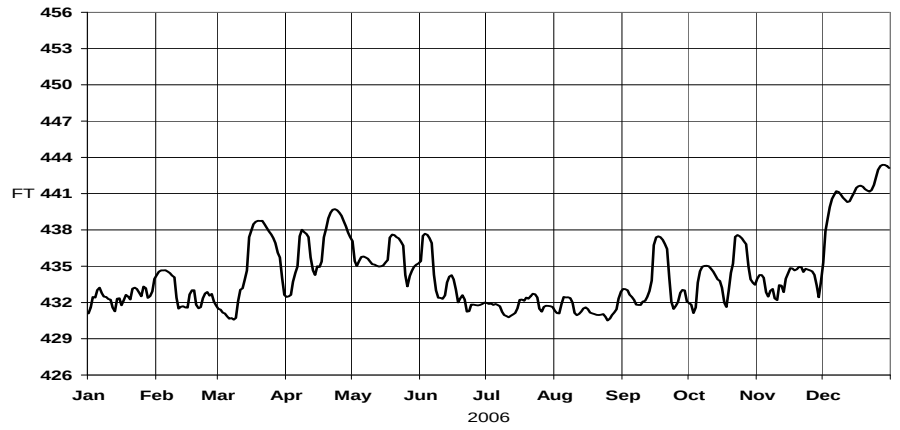
PLATE G-15

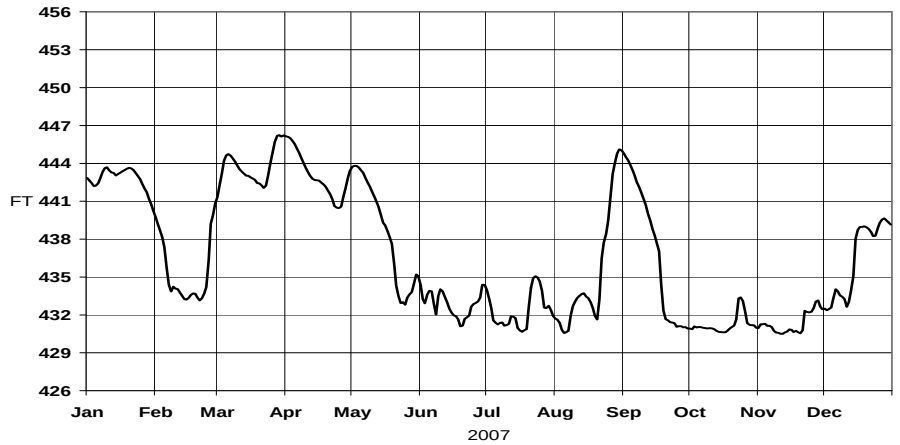


Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-16

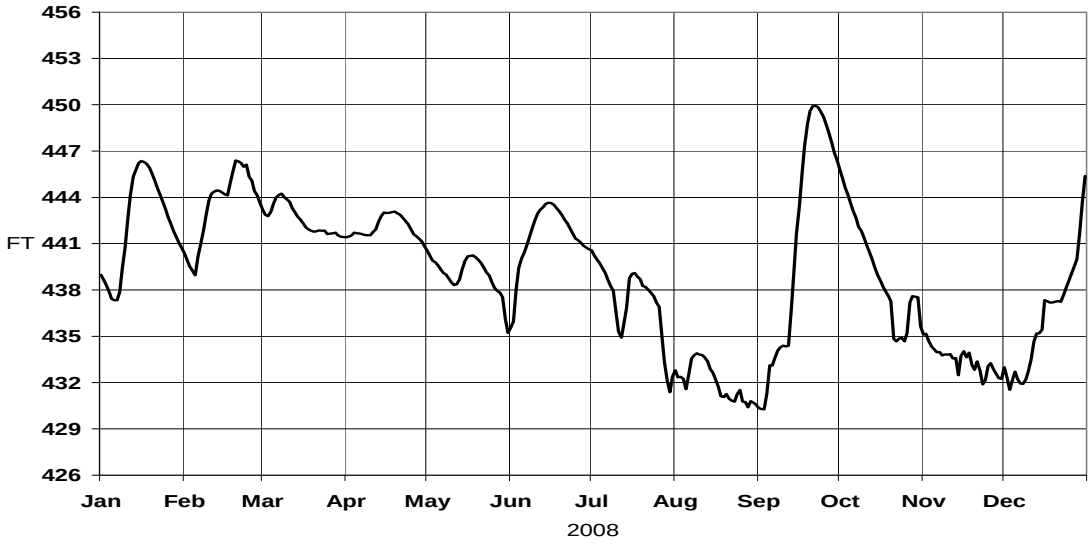






Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-17



Illinois River Stage Hydrographs at Copperas Creek by Year

PLATE G-18

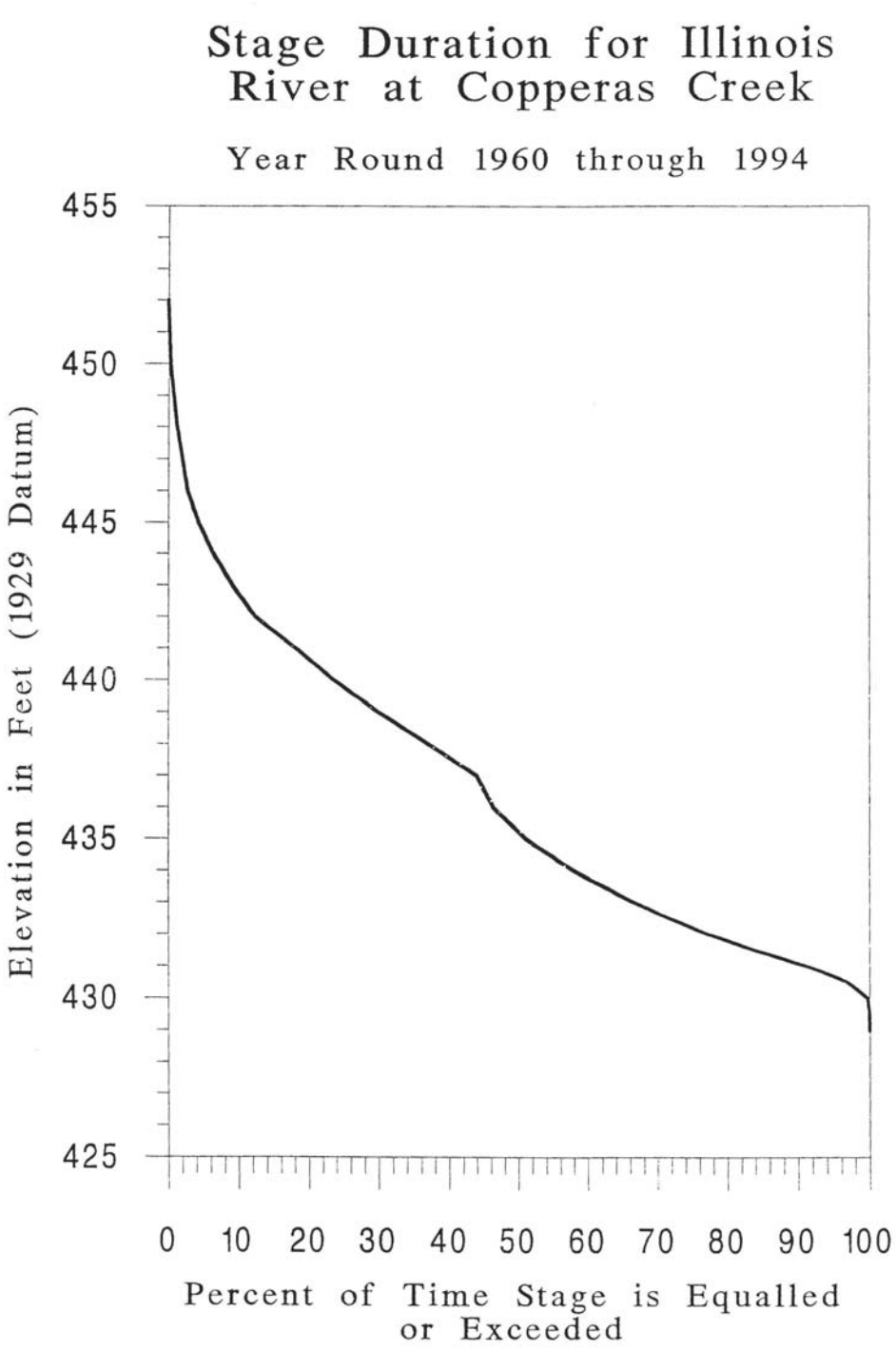

Stage Duration for Illinois River at Copperas Creek
Year Round 1960 through 1994
Elevation in Feet (1929 Datum)
455
450
445
440
435
430
425
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Stage is Equalled or Exceeded

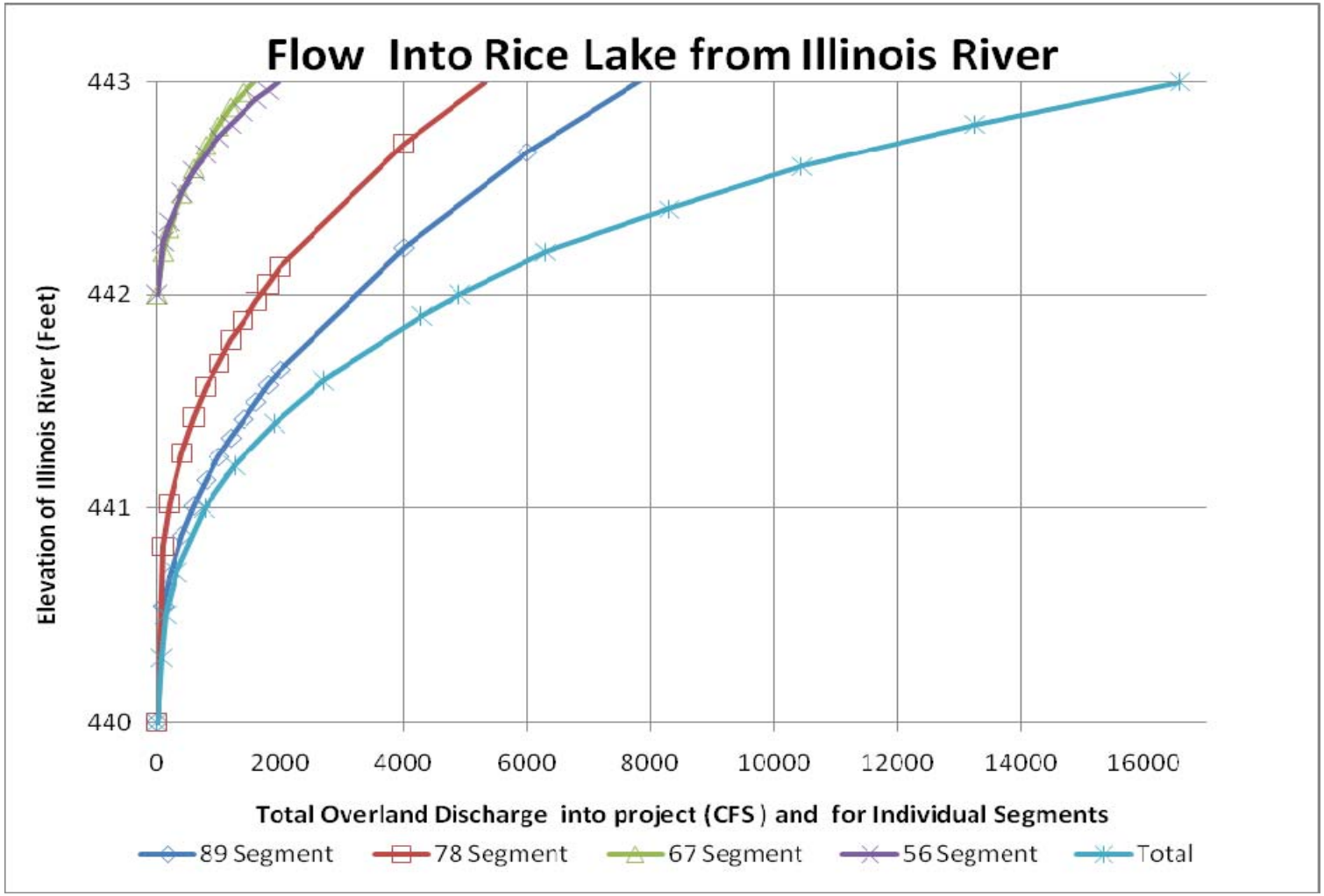
PLATE G-19

Yearly High and Low Stages at Copperas Creek Gage 1960-2008 (2003 omitted)

	Highest	Lowest				
Year	Stage (ft)	Stage (ft)	Date (mo/day)	Days Below Elev. 430	Other Occurrences Below Elev. 430 days (date)	
1960	445.9	430.2	10/22	0		
1961	443.9	430.3	1/13	0		
1962	447.3	430.6	9/23	0		
1963	440.5	430.3	6/26	0		
1964	439.6	429.6	2/13	3	4 (8-14)	
1965	443.8	430.8	7/28	0		
1966	444.8	429.6	10/3	2		
1967	443.6	430.0	9/14	0		
1968	444.2	430.7	9/17	0		
1969	442.9	430.9	9/15	0		
1970	448.7	430.8	9/4	0		
1971	441.3	430.0	9/18	0		
1972	442.6	431.2	2/16	0		
1973	449.5	430.1	9/13	0		
1974	449.5	429.9	9/28	2		
1975	443.7	430.3	10/8	0		
1976	447.2	429.4	9/9	6	3 (9-22)	1 (10-30)
1977	441.4	429.9	6/27	1		
1978	444.7	430.2	10/11	0		
1979	452.0	430.3	9/19	0		
1980	445.2	430.8	11/20	0		
1981	446.4	431.3	11/21	0		
1982	450.8	430.6	10/2	0		
1983	449.5	429.2	10/9	1		
1984	446.4	430.6	10/31	0		
1985	452.0	431.0	10/9	0		
1986	445.8	430.7	8/24	0		
1987	441.5	429.8	10/10	1		
1988	443.0	429.5	10/7	5		
1989	441.79	430.1	11/4	0		
1990	445.73	430.6	10/2	0		
1991	445.4	429.7	9/28	5		
1992	443.05	430.5	9/6	0		
1993	448.35	433.9	2/28	0		
1994	443.04	429.8	10/30	2		
1995	451.66	430.4	10/18	0		
1996	447.97	430.9	9/11	0		
1997	449.75	430.03	10/25	0		
1998	447.37	430.66	9/15	0		
1999	445.1	429.95	12/4	1	1 (10-28)	1 (11-8)
2000	441.83	429.85	9/3	1		
2001	446.44	429.86	8/18	1		
2002	451.13	430.0	9/18	0		
2003	441.14	429.86	2/16	2		
2004	443.94	429.81	9/30	2		
2005	448.9	429.8	10/14	4	1 (7-4), 2 (8-3),	1 (10-12), 1
2006	443.38	430.51	8/25	0		
2007	446.24	430.5	11/12	0		
2008	449.94	430.27	9-3	0		

PLATE G-20

PLATE G-21


Flow Into Rice Lake from Illinois River
Elevation of Illinois River (Feet)
443
442
441
440
0
2000
4000
6000
8000
10000
12000
14000
16000
Total Overland Discharge into project (CFS) and for Individual Segments
89 Segment
78 Segment
67 Segment
56 Segment
Total

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources
524 South Second Street, Springfield 62701-1787
Jim Edgar, Governor ● Brent Manning, Director

March 10, 1998

SUBJECT: Rice Lake State Fish and Wildlife Area
Habitat Rehabilitation and Enhancement

Mr. Darron Niles
U.S. Army Corps of Engineers
Rock Island District
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

ATTN: Planning Division

Dear Mr. Niles:

Thank you for the November 3, 1997 transmittal of your September 1997 Definite Project Report (R-17D) for the subject project. Please accept our apologies for the delay in providing this response. Our review indicates that an Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR) permit will be required and the work will need to comply with our Part 700 Floodway Construction, Part 702 Dam Safety and Part 704 Public Water rules. Copies of each of these sets of rules are enclosed. Our comments concerning the proposal are as follows:

FLOODWAY CONSTRUCTION REQUIREMENTS

Although almost the entire area is located within the floodway of the Illinois River, it appears that impacts on floodway conveyance and storage capacities will be minimal. However, plans for the disposal of future maintenance dredging of the proposed water conveyance channels should be provided with your permit application.

DAM SAFETY REQUIREMENTS

Although the primary purpose of the proposed water dike is to provide protection from minor river floods, it appears that the structure will also be used to impound water in the lakes. The dike will apparently have a maximum height in excess of 6 feet and an impounding capacity in excess of 50 acre feet. If so, the structure will need to comply with IDNR/OWR dam safety rules. The structure is provisionally classified as an intermediate size Class III (low hazard) dam. Since the Illinois Department of Natural Resources (IDNR) will own the structure and be responsible for its operation and maintenance, IDNR should be included as a co-applicant for the project.

[printed on recycled and recyclable paper]

PLATE G-22

Mr. Darron Niles
Page 2
March 10, 1998

PUBLIC WATER REQUIREMENTS

Most of the backwater lakes involved in this project are apparently connected by water to the Illinois River and are, therefore, public bodies of water. Since the proposed project is to be located on public property and is designed to enhance the natural resources of public waters, we anticipate that the project will comply with our public water requirements. However, it appears that an access channel between Goose Lake and the West River channel at River Mile 134.5 may be blocked. Your application should indicate if this is the case and, if so, include a discussion of measures that would be taken to minimize and/or mitigate the impact on access to the river.

Please feel free to contact Mike Diedrichsen of my staff at 217/782-3863 if you have any questions or comments concerning this matter.

Sincerely,

Dennis L. Kennedy, P.E.
Senior Water Resources Engineer

DLK:MLD:crw
Enclosures
cc: IDNR/Rice Lake State Fish & Wildlife Area (Bill Douglass)
IDNR/OREP (Bob Schanzle)

PLATE G-23

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX H
STRUCTURAL CONSIDERATIONS

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX H
STRUCTURAL CONSIDERATIONS

I. GENERAL

This appendix presents the design of the structures in the project to illustrate typical calculations that will be undertaken to complete the structural design for final Plans and Specifications (P&S). Computations are shown for the pump station and fish egress structure.

II. CRITERIA

The reinforced concrete hydraulic structures in the project will be designed following the current ACI Building Code and ETL 1110-2-312, *Strength Design Criteria for Reinforced Concrete Hydraulic Structures*. The few miscellaneous structural steel items in the project will be designed in accordance with EM 1110-1-2101, *Working Stresses for Structural Design*.

III. MATERIAL SELECTION

Concrete structures will be designed for 28-day compressive strength of 4,000 psi. Concrete reinforcement will be deformed billet-steel bars conforming to ACI 615, grade 60 requirements. Structural steel will meet ASTM-A36, and steel sheet piling will meet ASTM-A328.

IV. PUMP STATION

The pump station is designed to pump from the Illinois River. Trash racks and bulkheads will be provided on the river side to protect the pumps. The operating level will be below the one-year flood elevation. The electrical control panels will be protected inside a concrete block building located on the landside of the road. The bulkheads will be operated by a backhoe; therefore the pump station is designed to handle such loading. The preferred three-pump station scenario is presented on plates 28, 29, and 30 of the main report. This will be verified during P&S

IV. FISH EGRESS STRUCTURE

The same design will be applied to the Rice Lake and the Goose Lake locations. Design consists of a 9- by 7-foot box culvert to connect Rice Lake to the Duck Island gravel pit and Goose Lake to the Illinois River. Both will include a stop log structure and guardrails. Design computations are on the following pages. Final configuration will be made during P&S.

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX I
MECHANICAL AND ELECTRICAL CONSIDERATIONS

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX I
MECHANICAL AND ELECTRICAL CONSIDERATION

I. PURPOSE AND SCOPE

The purpose of this appendix is to present a preliminary design for the new pumping station at the Rice Lake State Fish and Wildlife Area. EM 1110-2-3105 entitled, "Mechanical and Electrical Design of Pumping Stations" and pump manufacturers' engineering information were used to develop the design and layout presented in this appendix. An initial design based on efficient operation of the station and ease of normal maintenance was done in 1996. Since then there have been some modifications. These modifications were based on sponsor needs and pump designs for other projects and will be reevaluated during the plans and specifications phase.

II. GENERAL

A new pump station housing three or four submersible propeller-type pumps is proposed for the Rice Lake project. Stations containing two and three pumps providing 100,000 gpm were evaluated in 1996. The current design of three or four pump options will provide 133,200 gpm giving the sponsor a more desirable filling time and operational flexibility.

The functions of the new pump station will be to discharge river water into the protected Big and Rice Lakes during waterfowl migration season for the purposes of creating a maintained flooded marsh.

The pumping station will be located upstream of the old Copperas Creek Lock at river mile 137.0. The pump station will be constructed approximately 400 ft from the road embankment and will pump water from the river through coated steel pipes.

III. STATION FEATURES

The pumps will provide approximately 133,200 total gpm and are sized to fill Rice Lake to elevation 437.0 and Big Lake to elevation 436.0 in 14 days. A hand-cleanable trash rack will be provided to protect the pump propellers from large debris.

The pump station structure will consist of a reinforced concrete structure and sump adjacent to the Illinois River with the pump station control building on the landside of the access road. The design system head computations and pump curves are shown on plates I-1 through I-35.

IV. OPERATION

The pump unit will be manually activated and when in the automatic mode, will shut off by float switches when the wildlife management area reaches the desired management elevation. In addition, a provision for complete manual operation will allow for manual shutoff when pumping is supervised.

V. ELECTRICAL

Each pump unit will be operated by a directly attached electric motor. Power will be provided by a 480/277 volt, 3 phase, 4 wire power line owned and maintained by Ameren.
The 480/277 volt power line will be transformed down to 208/120 volts to run the three or four approximately 240 or 185 HP pumps, respectively.

The electrical analysis is shown on plates I-36 through I-41. The topics covered in the electrical analysis include design considerations for the MCC, transformer, panel board, capacitors, grounding system, lightning protection system, interior/exterior lighting, and pump controls.

To:

From:

Michael Hrzic

Date:

04/20/10

Copy: File

Subject:
Rice Lake Pump Station
Hydraulic Support Calculations

Contract Number:

W912EK-09-D-0007, Task Order 006

Technical Memorandum

Background:
In support of the Rice Lake Pump Station design, the following summarizes independent set of design calculations completed in conjunction to mechanical calculations for the hydraulic design of determining pump size, pump station dimensions, outlet piping and channel design.

Relevant design criteria required for hydraulic analysis is shown in Table 1. All elevations are shown in NGVD 1929 feet.

Table 1. Design Criteria.

Interior Water Elevation	440 ft
Riverside Low Water Elevation	429 ft
Riverside High Water Elevation	440 ft
Pump Station Capacity	300 cfs

Analysis

Design calculations were performed in compliance with USACE EM-1110-2-3105 pump station design guidance. 4 scenarios were analyzed in total, scenarios are listed in Table 2. .

Table 2. Listing of Scenarios Analyzed

Scenario	# of Pumps	Discharge Layout
1	3	Piped
2	4	Piped
3	3	Open Channel
4	4	Open Channel

Pump Layout

The pump station consists of either three or four like parallel pumping units with a bell mouth configured intake, submersible axial flow pump, and a discharge distance approximately 300 ft in length.

The pump selected for the analysis is the Flygt PL 7101/835. The pump specifications provides the bell mouth diameter, pump size and level of submergence.

Pump Intake Configuration

Pump intake was based on USACE guidance EM-1110-2-3105 and manufactures installation guidance, Attachment 1. The pump bay configuration is a function of the bell diameter which is constant at 4 feet in diameter. Summary of intake bay dimensions shown in Table 3.

Table 3. Head losses for pump layout.

Scenario	1	2	3	4
Pump Design Q (cfs)	100	75	100	75
Bell Diameter (ft)	4	4	4	4
Intake Bay Parameters				
Riverside Low Water Elev (ft)	429	429	429	429
Interior Design Water Elev (ft)	440	440	440	440
Submergence	6.5	5	6.5	5
Bay Widh (ft)	8	8	8	8
Bay Length (ft)	24	24	24	24
Distance to Back Wall (ft)	2	2	2	2
Bell Floor Clearance (ft)	2	2	2	2

Pump Requirements

To determine the pump capacity for varying interior-flood side conditions head losses from the inlet to the outlet needed to be estimated.

Several general equations were used to estimate energy losses, they are as follows:

Roughness Loss $$h_f = .014\, V^2 \frac{L}{D\, 2g}$$ Equation 1.

h_f is friction loss (ft) based on Darcy-Weisbach equation. V is average velocity (ft/s), L is length (ft/100 ft), and D is pipe diameter; and g is acceleration due to gravity, 32.2 ft/s^2

Bend Loss $$h_b = k_b \frac{V^2}{2\, g}$$ Equation 2.

h_b is bend loss (ft), V is average velocity (ft/s); g is acceleration due to gravity, 32.2 ft/s^2; and k_b is the bend loss coefficient.

Table 4. Bend Loss Coefficients.

Bend Angle	Loss Coefficient
45^o	0.1
90^o	0.24
180^o	0.48

Entrance and Exit Losses $$h_e = k_e \frac{V_u^{\,2}}{2\, g}$$ Equation 4.

h_e is exit or entrance loss (ft), V_u is average exit or entrance velocity (associated to bellmouth diameter) (ft/s); g is acceleration due to gravity, 32.2 ft/s^2; and k_e is the exit or entrance loss coefficient. Initially the entrance loss coefficient for a bell mouth intake is 1.0. The exit loss coefficient was assumed to be 1.0.

Bulkhead Slot $$h_{bh} = k_{bh} \frac{V_u^{\,2}}{2\, g}$$ Equation 4.

H_{bh} is bulkhead slot loss (ft), V_u is average intake velocity (ft/s); g is acceleration due to gravity, 32.2 ft/s^2; and k_{bh} is the loss coefficient. The loss coefficient for bulkhead slot is 0.2.

Trash Rake Loss

USACE guidance (EM 1110-2-3105 pg E-2) suggests a head loss less than 0.5 ft could be expected for cleaned and properly designed rake. A more quantitative approach as specified was used to check the recommended value:

$$C_g = -0.00101 + 0.0252A_r + 6A_r^2 \qquad \text{Equation 6.}$$

$$A_r = \frac{(b_H + d_H)b_V + (b_V + d_V)b_H}{(b_V + d_V)(b_H + d_H)} \qquad \text{Equation 7.}$$

$$h_t = C_g \, V_U \sin(\theta) \qquad \text{Equation 8.}$$

Where b_H is the horizontal bar diameter, 0.5 inches, b_V is the vertical bar diameter, 1 inch, d_V is the vertical bar spacing, 28 inches, d_H is the horizontal bar spacing, 4 inches; θ is the rake angle; and h_t is the trash rake head loss. To account for clogging and other potential obstructions in the rack the assumed trash rake loss was 0.5 ft.

The pump station break down for individual losses is summarized in Table 5. The four pump alternative had an assumed pipe diameter of 3.5 ft, 3 pump layout 4 ft.

Table 5. Head losses.

Scenario	**1**	**2**	**3**	**4**
Pump Design Q (cfs)	100	75	100	75
Discharge Diameter (ft)	4	3.5	4	4
Loss Type	**Energy Loss (ft)**	**Energy Loss (ft)**	**Energy Loss (ft)**	**Energy Loss (ft)**
Trash Rake	0.5	0.5	0.5	0.5
Bulkhead Slot	0.1	0.1	0.1	0.1
Intake	1.0	0.6	1.0	0.6
Bend Losses	0.2	0.2	.5	0.3
Surface Roughness	1.0	1.0	0.0	0.0
Exit	1.0	1.0	1.0	0.6
Total	**3.8**	**3.4**	**3.1**	**2.1**

Open Channel Considerations

For the open channel pump outlet layout the channel is to be designed initially for a 0.002 slope, trapezoidal channel with 20 ft bottom width, 2H to 1V side slopes, an upstream invert elevation of 436 ft NGVD29. The channel will require rock lining to prevent erosion during the start up period which was assumed to be for a condition of one pump operating at 100 cfs and a design velocity associated to critical flow of 6.7 ft/s. During normal operation, the design discharge was 300 cfs, normal depth 3.1 ft. For determining total dynamic head, additional consideration is needed to account for the rise in water level to accelerate the flow from an assumed rest position to the average channel velocity at the design depth elevation of 440 ft NGVD29. The assumed channel roughness is 0.032, the design depth is 4 ft, and design channel velocity of 2.7 ft/s.

Channel lining was design for the critical velocity of 6.7 ft/s, requiring 0.7 ft d50 riprap.

Pump Requirements

The design condition corresponded to the a riverside water surface elevation corresponding to normal pool which also corresponds to design low water level, 429 ft NGVD29. Interior side or Rice Lake side design condition corresponds to the expected high water level to be able to pump against, it was established that the level corresponds to the future Rice Lake overflow spillway crest elevation 440 ft NGVD29. Pumping requirements for each scenario is shown in Table 6. It was assumed that the pump efficiency was 77% and the reducer efficiency was 97%. Note additional head for open channel condition to account for the acceleration head is equivalent to 1.1 times the open channel velocity head, 0.1 ft.

Scenario	**1**	**2**	**3**	**4**
Pump Design Q (cfs)	100	75	100	75
Static Head (ft)	11	11	11	11
Head Loss (ft)	3.8	3.4	3.1	2.1
Total Dynamic Head (ft)	14.8	14.4	14.2	13.2
Brake Horse Power	225	165	216	151

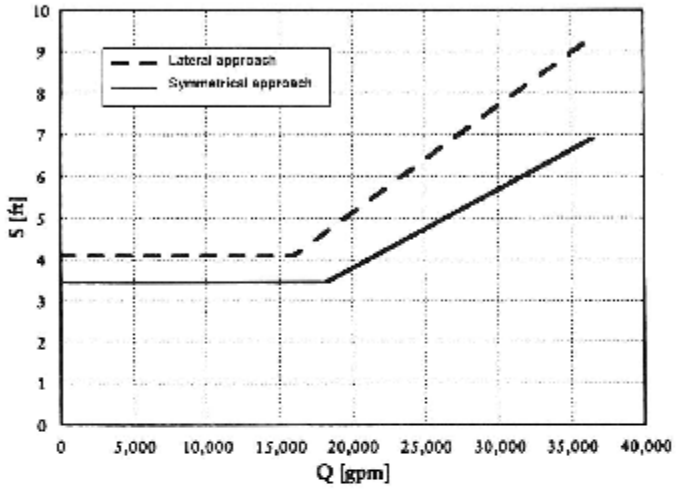
ITT
Water & Wastewater

PL-7076, PL-7081, PL-7101

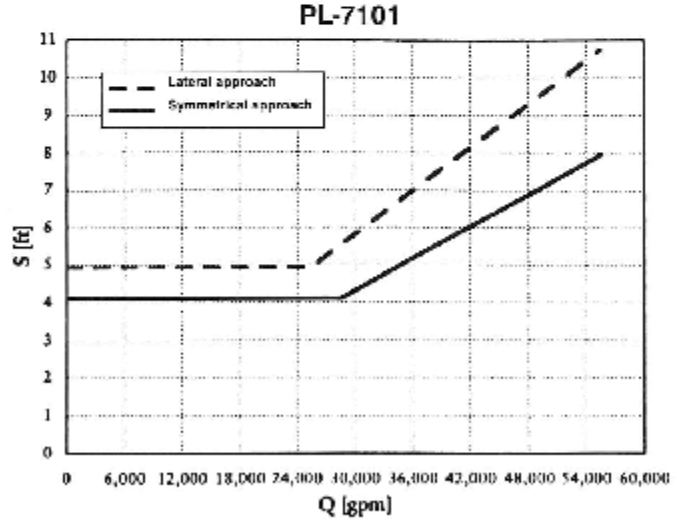
Minimum Submergence Curves for Configurations A1-A3

PL-7000 Series Pumps	Issued: 1/95	Supersedes:

PL-7076, PL-7081



PL-7101



Pump System Head Calculation Worksheet
Rice Lake PS Gated 3 Pumps Scenario 1
04/20/10

All elevations in ft NGVD

Discharge := 133250 (gpm)

$Q := \frac{Discharge}{448.83} = 296.9$ (cfs)

IWL := 429 FWL := 440 (ft)

Inv_Intake := 421

$d := \frac{48}{12} = 4$ (ft)

Hs := FWL − IWL = 11 (ft)

Design Discharge Q1 := 100

Intake Calculations

H := IWL − Inv_Intake = 8 (ft)

Bay_Width := 2·db = 8 (ft)

$Vu := \frac{Q1}{(Bay\_Width \cdot H)} = 1.563$

Trash Rake Lossses (ht)

Bv := 1 Vertical bar diameter (in) dv := 24 Vertical bar spacing (in)

Bh := .5 Horizontall bar diameter (in) dh := 2 Horizontall bar spacing (in)

ThetaR := 60 Trash Rack Angle

$Ar := \frac{[(Bh + dh)\cdot Bv + (Bv + dv)Bh]}{(Bv + dv)\cdot(Bh + dh)} = 0.24 \quad (ft^2)$

$Cg := -0.00101 + 0.0252\cdot Ar + 6\cdot Ar^2 = 0.351$

$ht := Cg\cdot Vu\cdot \sin\left(ThetaR\cdot \frac{3.14159}{180}\right) = 0.47$ (ft)

ht1 := 0.5 Trash rack loss set to 0.5 ft to account for obstructions.

Intake Loss (h1)

$V1 := \frac{Q1}{3.14159\cdot \frac{d^2}{4}} = 7.958$

$h1 := \frac{Vb^2}{64.4} = 0.98$ (ft)

Pump Bend Loss #1 (h2)

90 degree bend

K1 := 0.24

$h2 := \frac{K1\, V1^2}{64.4} = 0.24$ (ft)

Bulkhead Slot (h3) Bulkhead Slot IntakeInv := 421

$K2 := 0.2 \qquad V3 := \frac{Q}{(IWL - IntakeInv)\cdot Intake\_Width} = 4.639 \qquad h3 := \frac{K2\, V3^2}{64.4} = 0.1$ ft)

Pipe Friction Loss #1 (h6)

$e1 := .00095 \qquad \frac{e1}{d} = 2.375 \times 10^{-4} \qquad V1 = 7.958$

$Re1 := \frac{d\cdot V1}{1.217 \times 10^{-5}} = 2.616 \times 10^{6}$

$f1 := .014 \qquad l1 := 150 \quad (ft)$

$h6a := \frac{f1\cdot l1\cdot V1^2}{d\cdot 64.4} = 0.516 \quad (ft)$

$f2 := .014 \qquad l2 := 150 \quad (ft)$

$h6b := \frac{f1\cdot l2\cdot V1^2}{d\cdot 64.4} = 0.516 \quad (ft)$

$h6 := h6a + h6b = 1.03 \quad (ft)$

Pump Bend Loss #2 (h4)

45 degree bend

$K1 := 0.0 \qquad h4 := \frac{K1\, V1^2}{64.4} = 0 \quad (ft)$

Additional Head Loss (h5)

$K3 := 0.0 \quad (ft)$

$h5 := \frac{K3\, V1^2}{64.4} = 0$

(ft)

Exit Loss (h7)

$d2 := 4$

$$V2 := \frac{Q1}{3.14159 \cdot \frac{d2^2}{4}} = 7.958 \qquad h7 := \frac{V2^2}{64.4} = 1 \quad (ft)$$

Total Head Loss (Htotal)

$$Htotal := ht1 + h1 + h2 + h3 + 4h4 + h5 + h6 + h7 = 3.8 \quad (ft)$$

Static Head $Hs = 11$ (ft)

Total Dynamic Head (TDH)

$$TDH := Htotal + Hs = 14.8 \quad (ft)$$

Pump Horse Power

$$HP := 62.4 \cdot TDH \cdot \frac{Q1}{550} = 167.9 \quad (hp)$$

Pump Efficiency $Eff := 0.77$

Reducer Loss $REff := .03$

Engine Brake Horse Power

$$BHP := HP \cdot \frac{1}{Eff \cdot (1 - REff)} = 224.8 \ (hp) \qquad EHP := 250 \ (hp)$$ Engine Power Rating

Engine Power Margin $Power\_Margin := \frac{(EHP - BHP) \cdot 100}{EHP} = 10 \ (\%)$

Pump System Head Calculation Worksheet
Rice Lake PS Piped 4 Pumps Scenario 2
04/20/10

All elevations in ft NGVD

Discharge := 133250 (gpm)

$Q := \frac{Discharge}{448.83} = 296.9$ (cfs)

IWL := 429 OWL := 440 (ft)

Inv_Intake := 421.5

$d := \frac{42}{12} = 3.5$ (ft)

Hs := OWL − IWL = 11 (ft)

Outlet_Invert := 431 (ft)

Design Discharge Q1 := 75

Intake Calculations

$H := IWL - Inv\_Intake = 7.5$ (ft)

$Bay\_Width := 2 \cdot db = 8$ (ft)

$Vu := \frac{Q1}{(Bay\_Width \cdot H)} = 1.25$

Trash Rake Lossses (ht)

Bv := 1 Vertical bar diameter (in) dv := 24 Vertical bar spacing (in)

Bh := .5 Horizontall bar diameter (in) dh := 2 Horizontall bar spacing (in)

ThetaR := 60 Trash Rack Angle

$Ar := \frac{[(Bh + dh) \cdot Bv + (Bv + dv)Bh]}{(Bv + dv) \cdot (Bh + dh)} = 0.24 \quad (ft^2)$

$Cg := -0.00101 + 0.0252 \cdot Ar + 6 \cdot Ar^2 = 0.351$

$ht := Cg \cdot Vu \cdot \sin\left(ThetaR \cdot \frac{3.14159}{180}\right) = 0.38$ (ft)

ht1 := 0.5 Trash rack loss set to 0.5 ft to account for obstructions.

Intake Loss (h1)

$V1 := \frac{Q1}{3.14159 \cdot \frac{d^2}{4}} = 7.795$

$h1 := \frac{Vb^2}{64.4} = 0.55$ (ft)

Pump Bend Loss #1 (h2)

90 degree bend

K1 := .24

$h2 := \frac{K1\, V1^2}{64.4} = 0.2$ (ft)

Bulkhead Slot (h3) Bulkhead Slot IntakeInv := 421

$K2 := 0.2 \qquad V3 := \frac{Q}{(IWL - IntakeInv)\cdot Intake\_Width} = 4.639 \qquad h3 := \frac{K2\, V3^2}{64.4} = 0.1$ ft)

Pipe Friction Loss #1 (h6)

$e1 := .00095 \qquad \frac{e1}{d} = 2.714 \times 10^{-4} \qquad V1 = 7.795$

$Re1 := \frac{d\cdot V1}{1.217 \times 10^{-5}} = 2.242 \times 10^{6}$

$f1 := .014 \qquad l1 := 150 \quad (ft)$

$h6a := \frac{f1\cdot l1\cdot V1^2}{d\cdot 64.4} = 0.566 \quad (ft)$

$f2 := .014 \qquad l2 := 150 \quad (ft)$

$h6b := \frac{f1\cdot l2\cdot V1^2}{d\cdot 64.4} = 0.566 \quad (ft)$

$h6 := h6a + h6b = 1.1 \quad (ft)$

Pump Bend Loss #2 (h4)

45 degree bend

$K1 := 0.0$

$h4 := \frac{K1\, V1^2}{64.4} = 0 \quad (ft)$

Additional Head Loss (h5)

$K3 := 0.0 \quad (ft)$

$h5 := \frac{K3\, V1^2}{64.4} = 0$

(ft)

Exit Loss (h7)

$$d2 := 3.5$$

$$V2 := \frac{Q1}{3.14159 \cdot \frac{d2^2}{4}} = 7.795 \qquad h7 := \frac{V2^2}{64.4} = 0.94 \quad (ft)$$

Total Head Loss (Htotal)

$$Htotal := ht1 + h1 + h2 + h3 + 4h4 + h5 + h6 + h7 = 3.4 \quad (ft)$$

Static Head $Hs = 11$ (ft)

Total Dynamic Head (TDH)

$$TDH := Htotal + Hs = 14.4 \quad (ft)$$

Pump Horse Power

$$HP := 62.4 \cdot TDH \cdot \frac{Q1}{550} = 122.7 \quad (hp)$$

Pump Efficiency $Eff := 0.77$

Reducer Loss $REff := .03$

Engine Brake Horse Power

$$BHP := HP \cdot \frac{1}{Eff \cdot (1 - REff)} = 164.3 \ (hp) \qquad EHP := 220 \ (hp)$$ Engine Power Rating

Engine Power Margin $Power\_Margin := \frac{(EHP - BHP) \cdot 100}{EHP} = 25 \ (\%)$

Pump System Head Calculation Worksheet
Rice Lake PS Open Channel 3 Pumps Scenario 3
04/12/10

All elevations in ft NGVD

Discharge := 133250 (gpm)

$Q := \frac{Discharge}{448.83} = 296.9$ (cfs)

IWL := 429 FWL := 440 (ft)

Inv_Intake := 421

$d := \frac{48}{12} = 4$ (ft)

Hs := FWL − IWL = 11 (ft)

Design Discharge Q1 := 100

Intake Calculations

H := IWL − Inv_Intake = 8 (ft)

Bay_Width := 2·db = 8 (ft)

$Vu := \frac{Q1}{(Bay\_Width \cdot H)} = 1.563$

Trash Rake Lossses (ht)

Bv := 1 Vertical bar diameter (in) dv := 24 Vertical bar spacing (in)

Bh := .5 Horizontall bar diameter (in) dh := 2 Horizontall bar spacing (in)

ThetaR := 60 Trash Rack Angle

$Ar := \frac{[(Bh + dh) \cdot Bv + (Bv + dv)Bh]}{(Bv + dv) \cdot (Bh + dh)} = 0.24 \quad (ft^2)$

$Cg := -0.00101 + 0.0252 \cdot Ar + 6 \cdot Ar^2 = 0.351$

$ht := Cg \cdot Vu \cdot \sin\left(ThetaR \cdot \frac{3.14159}{180}\right) = 0.47$ (ft)

ht1 := 0.5 Trash rack loss set to 0.5 ft to account for obstructions.

Intake Loss (h1)

$V1 := \frac{Q1}{3.14159 \cdot \frac{d^2}{4}} = 7.958$

$h1 := \frac{Vb^2}{64.4} = 1$ (ft)

Pump Bend Loss #1 (h2)

180 degree bend

K1 := 0.48

$h2 := \frac{K1\, V1^2}{64.4} = 0.47$ (ft)

Bulkhead Slot (h3) Bulkhead Slot IntakeInv := 421

$K2 := 0.2 \qquad V3 := \frac{Q}{(IWL - IntakeInv)\cdot Intake\_Width} = 4.639 \qquad h3 := \frac{K2\,V3^2}{64.4} = 0.07$ (ft)

Pipe Friction Loss #1 (h6)

$e1 := .00095 \qquad \frac{e1}{d} = 2.375 \times 10^{-4} \qquad V1 = 7.958$

$Re1 := \frac{d\cdot V1}{1.217 \times 10^{-5}} = 2.616 \times 10^{6}$

$f1 := .014 \qquad l1 := 0$ (ft)

$h6a := \frac{f1\cdot l1\cdot V1^2}{d\cdot 64.4} = 0$ (ft)

$f2 := .014 \qquad l2 := 0$ (ft)

$h6b := \frac{f1\cdot l2\cdot V1^2}{d\cdot 64.4} = 0$ (ft)

$h6 := h6a + h6b = 0$ (ft)

Pump Bend Loss #2 (h4)

45 degree bend

$K1 := 0.0$

$h4 := \frac{K1\,V1^2}{64.4} = 0$ (ft)

Additional Loss (h5)

$K3 := 0.0$ (ft)

$h5 := \frac{K3\,V1^2}{64.4} = 0$ (ft)

Exit Loss (h7)

$d2 := 4$

$$V2 := \frac{Q1}{3.14159 \cdot \frac{d2^2}{4}} = 7.958 \qquad h7 := \frac{V2^2}{64.4} = 0.98 \quad (ft)$$

Open Channel Acceleration

$V4 := 2.7$ $\qquad h8 := \frac{1.1V4^2}{64.4} = 0.12$

$Hloss := ht1 + h1 + h2 + h3 + h4 + h5 + h6 + h7 = 3.005$

Total Head Loss (Htotal)

$Htotal := ht1 + h1 + h2 + h3 + h4 + h5 + h6 + h7 + h8 + .05 = 3.18$ (ft)

Static Head $Hs = 11$ (ft)

Total Dynamic Head (TDH)

$TDH := Htotal + Hs = 14.2$ (ft)

Pump Horse Power

$$HP := 62.4 \cdot TDH \cdot \frac{Q1}{550} = 160.9 \quad (hp)$$

Pump Efficiency $Eff := 0.77$

Reducer Loss $REff := .03$

Engine Brake Horse Power

$$BHP := HP \cdot \frac{1}{Eff \cdot (1 - REff)} = 215.4 \ (hp) \qquad EHP := 250 \ (hp)$$ Engine Power Rating

Engine Power Margin $\quad Power\_Margin := \frac{(EHP - BHP) \cdot 100}{EHP} = 14 \ (\%)$

Pump System Head Calculation Worksheet
Rice Lake PS Open Channel 3 Pumps Scenario 4
04/12/10

All elevations in ft NGVD

Discharge := 133250 (gpm)

$Q := \frac{Discharge}{448.83} = 296.9$ (cfs)

IWL := 429 FWL := 440 (ft)

Inv_Intake := 421

$d := \frac{48}{12} = 4$ (ft)

Hs := FWL − IWL = 11 (ft)

Design Discharge Q1 := 75

Intake Calculations

H := IWL − Inv_Intake = 8 (ft)

Bay_Width := 2·db = 8 (ft)

$Vu := \frac{Q1}{(Bay\_Width \cdot H)} = 1.172$

Trash Rake Lossses (ht)

Bv := 1 Vertical bar diameter (in) dv := 24 Vertical bar spacing (in)

Bh := .5 Horizontall bar diameter (in) dh := 2 Horizontall bar spacing (in)

ThetaR := 60 Trash Rack Angle

$Ar := \frac{[(Bh + dh)\cdot Bv + (Bv + dv)Bh]}{(Bv + dv)\cdot(Bh + dh)} = 0.24 \quad (ft^2)$

$Cg := -0.00101 + 0.0252\cdot Ar + 6\cdot Ar^2 = 0.351$

$ht := Cg\cdot Vu\cdot \sin\left(ThetaR\cdot \frac{3.14159}{180}\right) = 0.36$ (ft)

ht1 := 0.5 Trash rack loss set to 0.5 ft to account for obstructions.

Intake Loss (h1)

$V1 := \frac{Q1}{3.14159\cdot \frac{d^2}{4}} = 5.968$

$h1 := \frac{Vb^2}{64.4} = 0.6$ (ft)

Pump Bend Loss #1 (h2)

180 degree bend

K1 := 0.48

$h2 := \frac{K1\, V1^2}{64.4} = 0.27$ (ft)

Bulkhead Slot (h3) Bulkhead Slot IntakeInv := 421

$K2 := 0.2 \qquad V3 := \frac{Q}{(IWL - IntakeInv)\cdot Intake\_Width} = 4.639 \qquad h3 := \frac{K2\,V3^2}{64.4} = 0.07$

Pipe Friction Loss #1 (h6)

$e1 := .00095 \qquad \frac{e1}{d} = 2.375 \times 10^{-4} \qquad V1 = 5.968$

$Re1 := \frac{d\cdot V1}{1.217 \times 10^{-5}} = 1.962 \times 10^{6}$

$f1 := .014 \qquad l1 := 0 \quad (ft)$

$h6a := \frac{f1\cdot l1\cdot V1^2}{d\cdot 64.4} = 0 \quad (ft)$

$f2 := .014 \qquad l2 := 0 \quad (ft)$

$h6b := \frac{f1\cdot l2\cdot V1^2}{d\cdot 64.4} = 0 \quad (ft)$

$h6 := h6a + h6b = 0 \quad (ft)$

Pump Bend Loss #2 (h4)

45 degree bend

$K1 := 0.0$

$h4 := \frac{K1\,V1^2}{64.4} = 0 \quad (ft)$

Additional Loss (h5)

$K3 := 0.0 \quad (ft)$

$h5 := \frac{K3\,V1^2}{64.4} = 0 \quad (ft)$

Exit Loss (h7)

$d2 := 4$

$$V2 := \frac{Q1}{3.14159 \cdot \frac{d2^2}{4}} = 5.968 \qquad h7 := \frac{V2^2}{64.4} = 0.55 \quad (ft)$$

Open Channel Acceleration

$V4 := 2.7$ $\qquad h8 := \frac{1.1V4^2}{64.4} = 0.12$

$Hloss := ht1 + h1 + h2 + h3 + h4 + h5 + h6 + h7 + .15 = 2.089$

Total Head Loss (Htotal)

$Htotal := Hloss + h8 = 2.213$ (ft)

Static Head $Hs = 11$ (ft)

Total Dynamic Head (TDH)

$TDH := Htotal + Hs = 13.2$ (ft)

Pump Horse Power

$$HP := 62.4 \cdot TDH \cdot \frac{Q1}{550} = 112.4 \quad (hp)$$

Pump Efficiency $Eff := 0.77$

Reducer Loss $REff := .03$

Engine Brake Horse Power

$$BHP := HP \cdot \frac{1}{Eff \cdot (1 - REff)} = 150.5 \ (hp) \qquad EHP := 250 \ (hp)$$ Engine Power Rating

Engine Power Margin $\quad Power\_Margin := \frac{(EHP - BHP) \cdot 100}{EHP} = 40 \ (\%)$

Calculations for	Rice Lake	Job No.	Sheet No.
Made by	MAH	Date	
Checked by		Date	
Backchecked by		Date	

HNTB

Channel Design

Q = 100

Critical Velocity

depth = 0.7'

V_c = 6.7 ft/s

Fr = 1

Q ≈ 100

Trapezoidal

Bottom width = 20'

Side Slope = 2H:1V

→ HDC 712-1 → d50 = 0.65'

assume = 0.7'

To:

Rachel Fellman – USACE, RI

From:

Date:

Copy: File

Subject:

Rice Lake Pump Station

Contract Number:

W912EK-09-D-0007, Task Order 006

Technical Memorandum

Background:

Analysis:

Pump station design criteria are per design guidelines of USACE EM 1110-2-3102, 3104, 3105 and ETL 1110-2-313, as well as other documents, which are listed in "Section 2, REFERENCES" in the Pump Station Design Calculation.

Based on the total flow of 133,200 gallons per minute, two pump selection options are analyzed. Option #1 – 3 pumps will be provided with pump capacity of 44,400 gpm, each. Option #2 – 4 pumps will be provided with pump capacity of 33,300 gpm each.

Pump suction bell diameters are first selected per suction velocity guideline in Hydraulic Institute Pump Intake Design. Pump discharge pipe sizes are selected based on the discharge velocity of 8ft/sec, and the standard pipe schedule. For pump submergence requirement, the three USACE Design documents yield three different requirements. Submergence requirements per Gordon Formula and Hydraulic Institute are also calculated (see "Section 4.5.2/4.5.3" in the Pump Station Design Calculation for details). The pump submergence requirements based on Gordon Formula are first selected.

Flygt Pump Model PL7101 meets the design requirements and is selected for both options. Pump Station Design Calculation is revised to reflect the Flygt pumps' suction bell diameters and to satisfy the Flygt pumps'

submergence requirement. Pump station sump has been tailored to satisfy the Flygt pumps' specific requirement.

The pump station design shall be re-evaluated once the actual pumps are procured and necessary changes shall be made to satisfy the requirements of the procured pumps.

Calculations For	Rice Lake New Pumping Station	Job No.	42864-DS-009-001	HNTB	Sheet No.
Made by	E. Li	Date	April 19, 2010		PAGE 1
Checked by	M. Hrzic	Date			OF 5
Approved by	M. Kennedy	Date			

Red = Input Value
Blue = Input Value From Other Input
Black = Calculated Value

1 DESCRIPTION / PURPOSE

To size pumps, piping, and sump.

2 REFERENCES

(1). Scope Of Work
(2). Design Quality Control Plan
(3). Pump Intake Design - Hydraulic Institute
(4). Crane Technical Paper No. 410
(5). Cameron Hydraulic Data
(6). Vortices at intakes, by J.L. Gordon
(7). USACE EM 1110-2-3102, 3104, and 3105
(8). USACE ETL 1110-2-313
(9). Rice Lake Pump Station Kickoff Meeting Notes, dated 4/12/2010

3 ASSUMPTIONS

(1). Pump Station Design is per Flygt Pump Model PL 7101.

4 PUMP SIZING

4.1 Pump Design Criteria

Water Properties					Design Case #1		Design Case #2	
Pressure psia	Temperature °F	Density ρ lb/ft^3	Viscosity μ centipoise	Total Flow gpm	Number of Pumps	Pump Flow, Q gpm	Number of Pumps	Pump Flow, Q gpm
14.7	60	62.196	1.1229	133,200	3	44,400	4	33,300

4.2 Velocity and Pressure Loss

$v = 0.408Q/d^2$, fps

$R_e = 50.6Q\rho/d\mu$

$f = 0.25/\{\log_{10}[(\varepsilon/D)/3.7+(5.74/R_e^{0.9})]\}^2$ where ε = 0.00015

$K = fL/D = 100f/D$ where L is set to be 100 ft.

$h_L/100' = 0.00259KQ^2/d^4$, ft

where Q = flow rate, gpm
ρ = density, lb/ft^3
d = inside diameter, in
D = inside diameter, ft
μ = viscosity, centipoise

Suction:

Design Case	Pump Flow gpm	Bell Design Diameter (per Flygt Pump Model PL7101) in.	Velocity ft/sec	Reynolds Number R_e	Friction Factor f	Pressure Loss, h_L/100' ft
#1	44,400	48.0	7.86	2.59E+06	0.011305	0.27
#2	33,300	48.0	5.90	1.94E+06	0.011592	0.16

Suction Velocity Criteria:
Pump Suction Max. Velocity = 7 ft/sec
(Hydraulic Institute recommended velocity is 5.5 ft/sec)

Discharge:

Design Case	Pump Flow gpm	Nominal Discharge Pipe Size in.	Pipe Inside Diameter in.	Velocity ft/sec	Reynolds Number R_e	Friction Factor f	Pressure Loss, h_L/100' ft
#1	44,400	48	47.25	8.11	2.63E+06	0.011307	0.29
#2	33,300	42	41.25	7.98	2.26E+06	0.011597	0.33

Discharge Velocity Criteria:
Pump Discharge Max. Velocity = 8 ft/sec

4.3 **Friction Loss in Pipe Fittings in Terms of Equivalent Length - Feet of Straight Pipe**

L = KD/f

Design Case #1 - Suction

	Pipe Size (in.) = 48.0			
Fittings	Quantity	Resistance Coefficient K	Equivalent Length ft	Total Equiv. Length ft
Entrance	1	0.5	176.92	176.92
Straight pipe	0			
Total Equivalent Length	177			

Design Case #2 - Suction

	Pipe Size (in.) = 48.0			
Fittings	Quantity	Resistance Coefficient K	Equivalent Length ft	Total Equiv. Length ft
Entrance	1	0.5	172.54	172.54
Straight pipe	0			
Total Equivalent Length	173			

Design Case #1 - Discharge

	Pipe Size (in.) = 48.0			
Fittings	Quantity	Resistance Coefficient K	Equivalent Length ft	Total Equiv. Length ft
90^o elbow	1	0.36	125.36	125.36
Exit	1	1.0	348.23	348.23
Straight pipe	400			
Total Equivalent Length	**874**			

Design Case #2 - Discharge

	Pipe Size (in.) = 42.0			
Fittings	Quantity	Resistance Coefficient K	Equivalent Length ft	Total Equiv. Length ft
90^o elbow	1	0.36	106.71	106.71
Exit	1	1.0	296.41	296.41
Straight pipe	400			
Total Equivalent Length	**803**			

4.4 **Head Loss**

Head Loss h_L = (Total Equivalent Length)/100 x (h_L/100')

4.4.1 Head Loss in Suction

Design Case	Pipe Size in.	Total Equivalent Length ft	h_L/100' ft	Head Loss h_L ft	Other Loss ft	Total Head Loss ft
#1	48.0	177	0.27	0.48	-	0.48
#2	48.0	173	0.16	0.27	-	0.27

4.4.2 Head Loss in Discharge Pipe

Design Case	Pipe Size in.	Total Equivalent Length ft	h_L/100' ft	Head Loss h_L ft	Other Loss ft	Total Head Loss ft
#1	48.0	874	0.29	2.57	-	2.57
#2	42.0	803	0.33	2.69	-	2.69

4.5 Pump Sizing

4.5.1 Pump Capacity (see Section 4.1 above)

Design Case	Number of Pumps	Pump Capacity gpm	Pump Capacity cfs
#1	3	44,400	99
#2	4	33,300	74

4.5.2 Pump Suction Pressure - Design Case #1

(1). Pump intake surface pressure = 14.7 psia = 0.0 psig

(2). Suction piping loss = 0.48 ft = 0.21 psi

(3). Minimum submergence, S = 6.50 ft (based on Flygt Pump, per (3.6) below)

(3.1) Per Ref. 7, EM 1110-2-3105, Appendix B, B-2.7, min. submergence shall be 2ft above impeller eye for pump operating hours between 100 to 299 per year. S = 2+L = 4.00 ft

where L = distance between impeller eye and bottom of bell = 0.5D = 2.00 ft

D = bell design diameter = 48.0 in

(3.2) Per Ref. 7, EM 1110-2-3105, Appendix B, Chart B-2, S = 1.25D = 5.00 ft

(3.3) Per Ref. 8, $S \geq 1.25D$, and $Q/(D^{5/2}g^{1/2}) \leq 0.4$, which gives the following:

$S \geq 1.25[Q/(0.4xg^{1/2})]^{2/5} \geq$ 5.66 ft

where Q = 99 cfs

g = 32.2 ft/sec^2

(3.4) Per Ref. 3, $S = D+0.574Q/D^{1.5}$ = 124.64 in = 10.39 ft

(3.5) Per Ref. 6, $S = 0.4vd^{0.5}$ = 3.50 ft, rounded up to 4.00 ft

where d = distance between bottom of pump bell and sump floor = 0.5D = 2.00 ft

v = flow velocity approaching to pump suction = Q/wd = 6.18 fps

w = pump bay width = 2D = 8.00 ft

(3.6) Per Flygt Pump Model PL-7101, S = 6.50 ft

(4). Distance between bottom of pump bell and sump floor = 0.5D = 2.00 ft

(5). Sump floor elevation = 420.50 ft

(6). Pump minimum required water level elevation = (3)+(4)+(5) = 429.00 ft

(Note: Sump floor elevation is set to make the pump minimum required water level elevation below EL. 429.00)

(7). Pump impeller eye (entrance) elevation = 0.5D+ (4)+(5) = 424.50 ft

(8). Suction static head = (6)-(7) = 4.50 ft

(9). Suction static head converting to psi = 1.94 psi

(10). Vapor pressure at water temperature = 0.2561 psia

(11). Suction Pressure = (1)+(9)-(2) = 1.74 psig

(12). NPSHA = (1)-(10)+(9)-(2) = 16.18 psi = 37.46 ft

4.5.3 Pump Suction Pressure - Design Case #2

(1). Pump intake surface pressure = 14.7 psia = 0.0 psig

(2). Suction piping loss = 0.27 ft = 0.12 psi

(3). Minimum submergence, S = 5.00 ft (based on Flygt Pump, per (3.6) below)

(3.1) Per Ref. 7, EM 1110-2-3105, Appendix B, B-2.7, min. submergence shall be 2ft above impeller eye for pump operating hours between 100 to 299 per year. S = 2+L = 4.00 ft

where L = distance between impeller eye and bottom of bell = 0.5D = 2.00 ft

D = bell design diameter = 48.0 in

(3.2) Per Ref. 7, EM 1110-2-3105, Appendix B, Chart B-2, S = 1.25D = 5.00 ft

(3.3) Per Ref. 8, $S \geq 1.25D$, and $Q/(D^{5/2}g^{1/2}) \leq 0.4$, which gives the following:

$S \geq 1.25[Q/(0.4xg^{1/2})]^{2/5} \geq$ 5.04 ft

where Q = 74 cfs

g = 32.2 ft/sec^2

(3.4) Per Ref. 3, $S = D+0.574Q/D^{1.5}$ = 105.48 in = 8.79 ft

(3.5) Per Ref. 6, $S = 0.4vd^{0.5}$ = 2.62 ft, rounded up to 3.00 ft

where d = distance between bottom of pump bell and sump floor = 0.5D = 2.00 ft

v = flow velocity approaching to pump suction = Q/wd = 4.64 fps

w = pump bay width = 2D = 8.00 ft

(3.6) Per Flygt Pump Model PL-7101, S = 5.00 ft

(4). Distance between bottom of pump bell and sump floor = 0.5D = 2.00 ft

(5). Sump floor elevation = 422.00 ft

(6). Pump minimum required water level elevation = (3)+(4)+(5) = 429.00 ft

(Note: Sump floor elevation is set to make the pump minimum required water level elevation below EL. 429.00)

(7). Pump impeller eye (entrance) elevation = 0.5D+ (4)+(5) = 426.00 ft

(8). Suction static head = (6)-(7) = 3.00 ft

(9). Suction static head converting to psi = 1.30 psi

(10). Vapor pressure at water temperature = 0.2561 psia

(11). Suction Pressure = (1)+(9)-(2) = 1.18 psig

(12). NPSHA = (1)-(10)+(9)-(2) = 15.62 psi = 36.17 ft

4.5.4 Pump Discharge Pressure - Design Case #1

(1). Pressure at delivery point = 0.0 psig

(2). Discharge piping loss = 2.57 ft = 1.11 psi

(3). Discharge water level elevation = 440.0 ft

(4). Pump impeller eye (entrance) elevation = 424.50 ft

(5). Discharge static head = (3)-(4) = 15.5 ft

(6). Discharge static head converting to psi = 6.69 psi

(7). Required discharge pressure = (1)+(2)+(6) = 7.80 psig

(8). Margin = 5% of (7) = 0.39 psig

(9). Design Discharge Pressure = (7)+(8) = 8.19 psig

4.5.5 Pump Discharge Pressure - Design Case #2

(1). Pressure at delivery point = 0.0 psig

(2). Discharge piping loss = 2.69 ft = 1.16 psi

(3). Discharge water level elevation = 440.0 ft

(4). Pump impeller eye (entrance) elevation = 426.00 ft

(5). Static head = (3)-(4) = 14.0 ft

(6). Static head converting to psi = 6.05 psi

(7). Required discharge pressure = (1)+(2)+(6) = 7.21 psig

(8). Margin = 5% of (7) = 0.36 psig

(9). Design Discharge Pressure = (7)+(8) = 7.57 psig

4.5.6 Pump Total Head

Pump Total Head = Discharge Pressure - Suction Pressure

Design Case	Discharge Pressure psig	Suction Pressure psig	Pump Total Head psig	Pump Total Head ft
#1	8.19	1.74	6.46	14.95
#2	7.57	1.18	6.39	14.79

4.5.7 Pump Sizing Summary

Design Case	Number of Pumps	Pump Capacity gpm	Pump Capacity cfs	Pump Total Head psig	Pump Total Head ft	Pump Bell Design Diameter in.	Discharge Pipe Inside Diameter in.	Sump Floor Elevation ft
#1	3	44,400	99	6.46	14.95	48.0	47.3	420.50
#2	4	33,300	74	6.39	14.79	48.0	41.3	422.00

5 PUMP SELECTION

Select Flygt Pump Model PL-7101. Pump data are attached.

6 SUMP CONFIGURATION

Refer to Dwg. PLATE 25 and PLATE 26

ITT Water & Wastewater

PERFORMANCE CURVE

PRODUCT	TYPE
PL 7101 /835	

DATE	PROJECT	CURVE NO	ISSUE
2010-04-15	Rice Lake IL	63-505N4	4

	1/1-LOAD	3/4-LOAD	1/2-LOAD
POWER FACTOR	0.66	0.61	0.50
EFFICIENCY	90.5 %	90.5 %	89.0 %
MOTOR DATA	---	---	---

RATED POWER	185	hp
STARTING CURRENT ...	1035	A
RATED CURRENT ...	288	A
RATED SPEED	505	rpm
TOT.MOM.OF INERTIA ...	13	kgm2
NO. OF BLADES	4	

BLADE ANGLE	IMPELLER DIAMETER
21 deg	755 mm

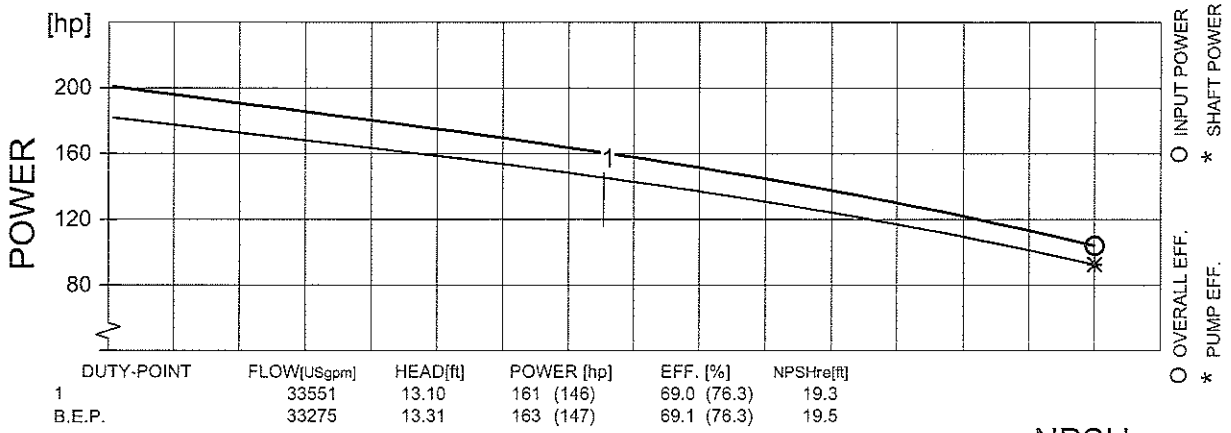
MOTOR #	STATOR	REV
54-52-14AA	01D	12

FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	14

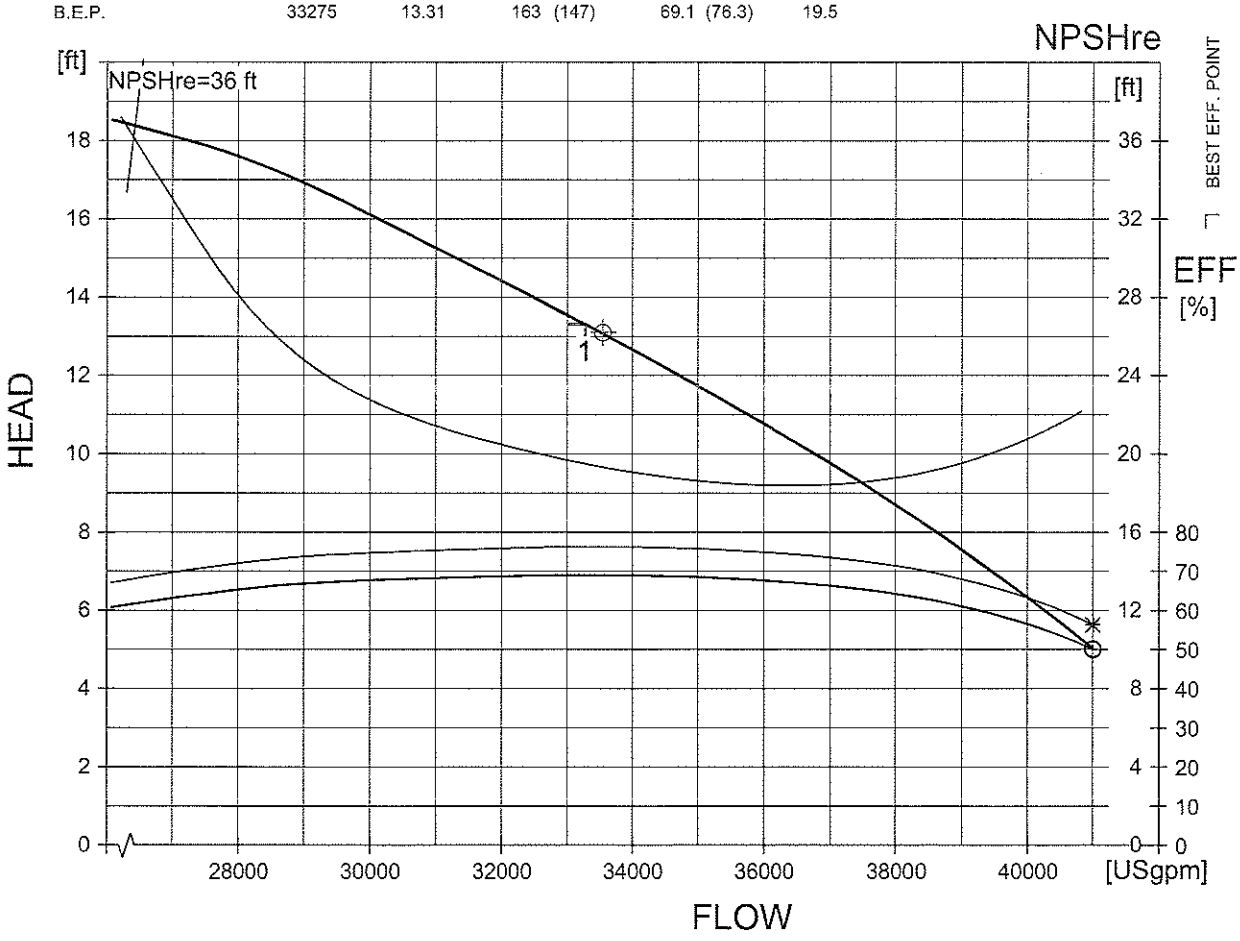
GEARTYPE	RATIO
---	---

COMMENTS

INLET/OUTLET	IMP. THROUGHLET
-/-	---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
1	33551	13.10	161 (146)	69.0 (76.3)	19.3
B.E.P.	33275	13.31	163 (147)	69.1 (76.3)	19.5



NPSHre = NPSH3% + min. operational margin

Performance with clear water and ambient temp 40 °C

FLYGT

HI B Curve

FLYPS3.1.6.5 (20090313)

ITT Water & Wastewater

PERFORMANCE CURVE

PRODUCT	TYPE
PL 7101 /835	

DATE	PROJECT	CURVE NO	ISSUE
2010-04-15	Rice Lake IL	63-590N4	4

	1/1-LOAD	3/4-LOAD	1/2-LOAD
POWER FACTOR	0.64	0.58	0.47
EFFICIENCY	93.0 %	93.0 %	92.0 %
MOTOR DATA	---	---	---

RATED POWER	240	hp
STARTING CURRENT ...	1500	A
RATED CURRENT ...	375	A
RATED SPEED	590	rpm
TOT.MOM.OF INERTIA ...	13	kgm2
NO. OF BLADES	4	

BLADE ANGLE	IMPELLER DIAMETER
24 deg	755 mm

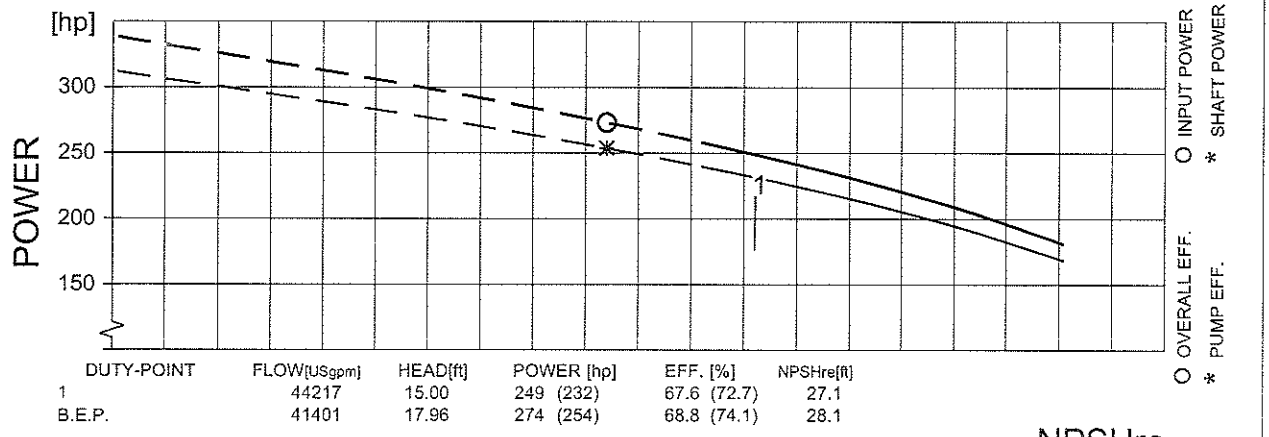
MOTOR #	STATOR	REV
54-52-12AA	01D	13

FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	12

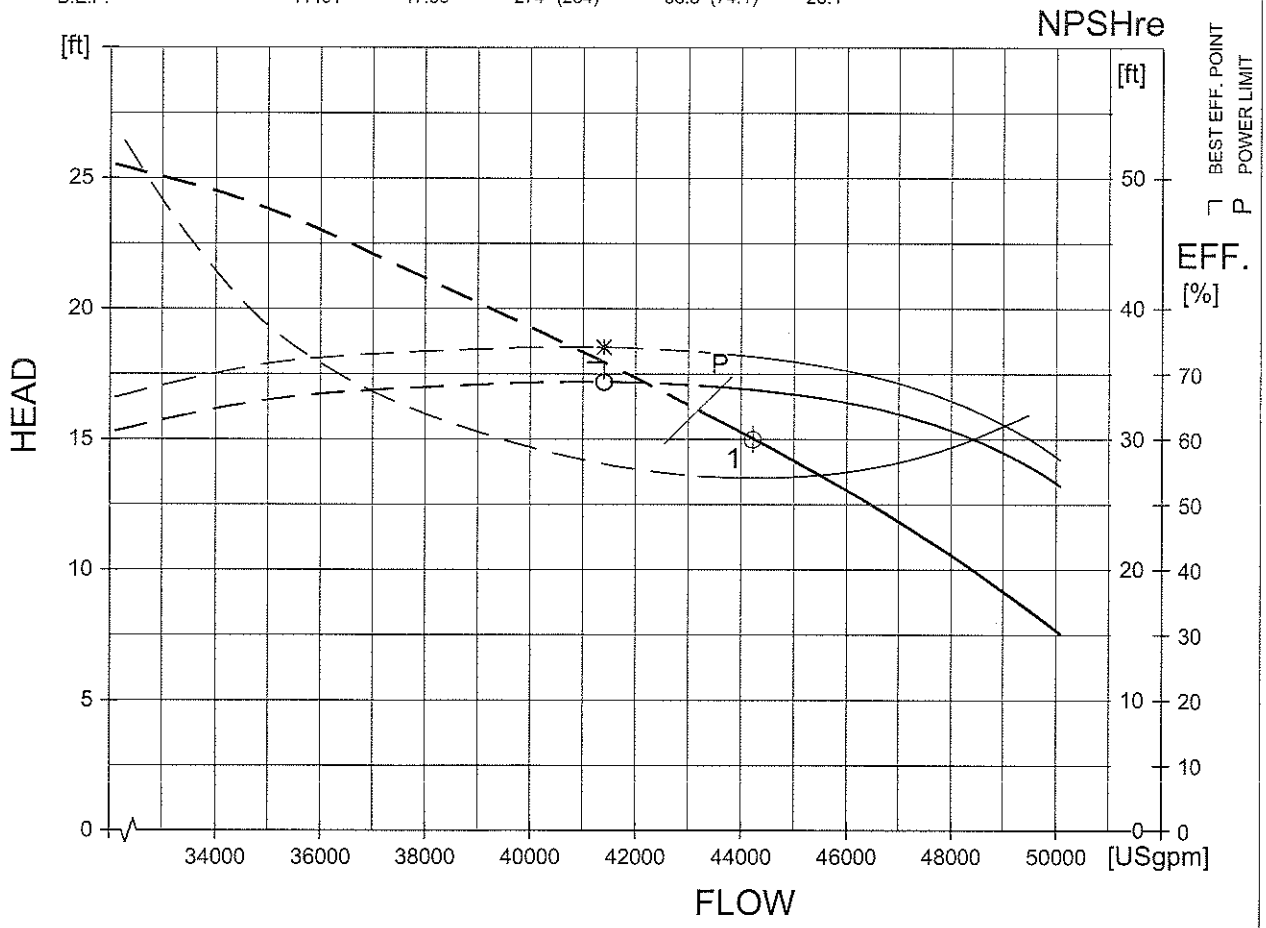
GEARTYPE	RATIO
---	---

COMMENTS

INLET/OUTLET	IMP. THROUGHLET
-/-	---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
1	44217	15.00	249 (232)	67.6 (72.7)	27.1
B.E.P.	41401	17.96	274 (254)	68.8 (74.1)	28.1



FLYPS3.1.6.5 (20090313)

NPSHre = NPSH3% + min. operational margin

Performance with clear water and ambient temp 40 °C

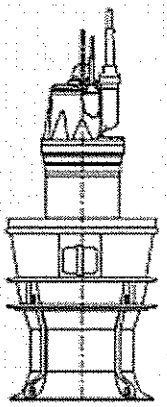
FLYGT

HI B Curve

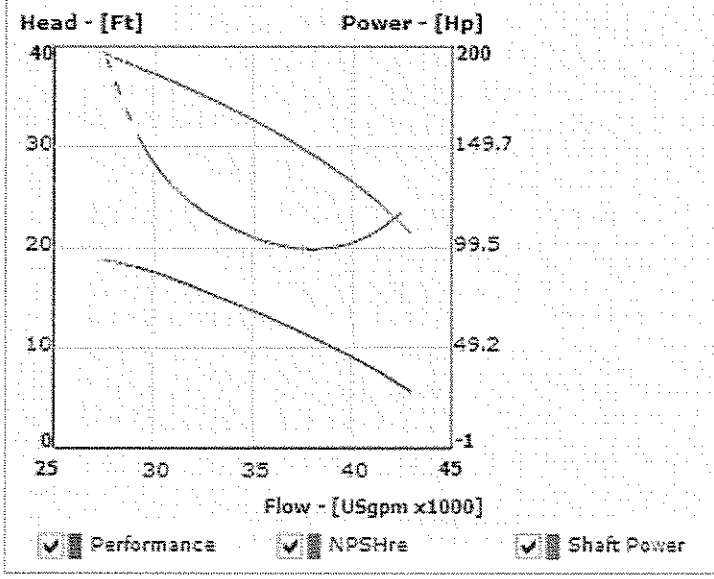
FLYGT

PRODUCT: PL 7101 / 835

Product picture



Curves ⊕ **Enlarge** Available blade angle: 24° *



Pump Data

Curve id: 63-505B4	Propeller: 505	Poles: 14 - pole	Motor: 54-52-14AA	Frequency: 60 Hz

Motor Data

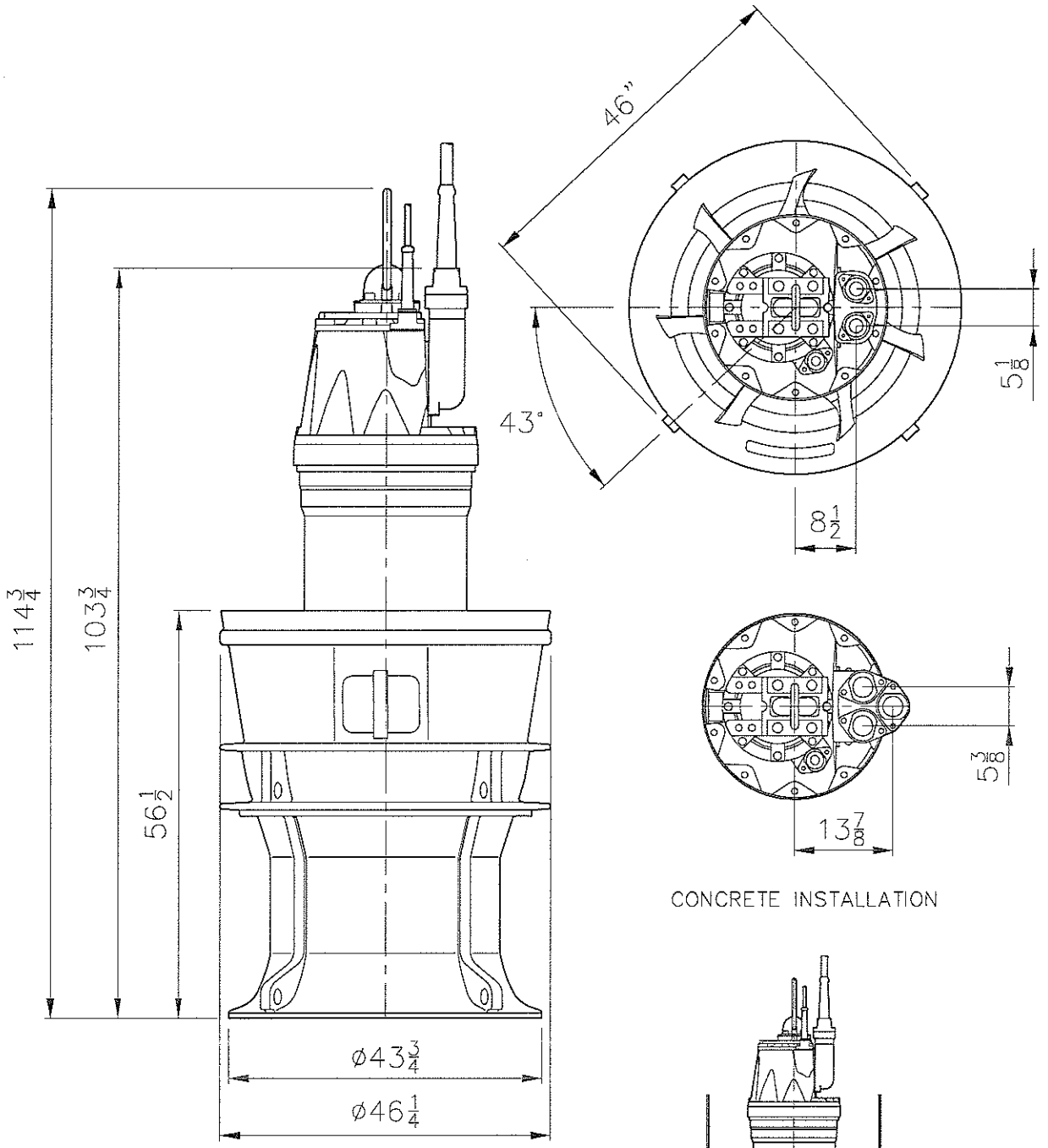
Rated output power Hp (kW)	Ø	Nominal voltage (V)	Full load current (A)	Locked rotor current (A)	Locked rotor kVA	Locked rotor code letter kVA/Hp	Poles/rpm
185 (138)	3	460	288	1035	824	D	14/505

Pump motor Hp	Efficiency			Power factor		
	100% load	75% load	50% load	100% load	75% load	50% load
185	90.5	90.5	89	0.66	0.61	0.5

Cable Data

HP	Cables	Volts	Max. length (Ft)	Cable size/Nominal OD.	Conductors (In one cable)	Type	Part number
185	2	460	420	4 G 50 1.69"-(43mm)	(3) 50 mm² (PWR) (1) 50 mm² (GND)	STD	942066
Pilot cable				S12 X 1.5 30.0 mm (1.18")	(12) 1.5 (CTRL)		94 08 94

Engineered for life



CONCRETE INSTALLATION

SEE "FLYGT SYSTEM AND APPLICATION ENGINEERING BULLETIN"

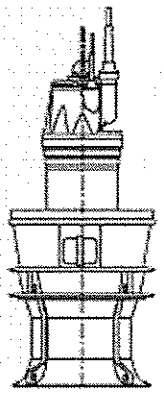
Weight (lbs)
Total
6835

FLYGT AUTOCAD DRAWING	Denomination: Dimensional drwg PL 7101 835/845	Drawn by ROS	Checked by LJn	Date 920301
		Scale		Reg no 5799
		5843300		2

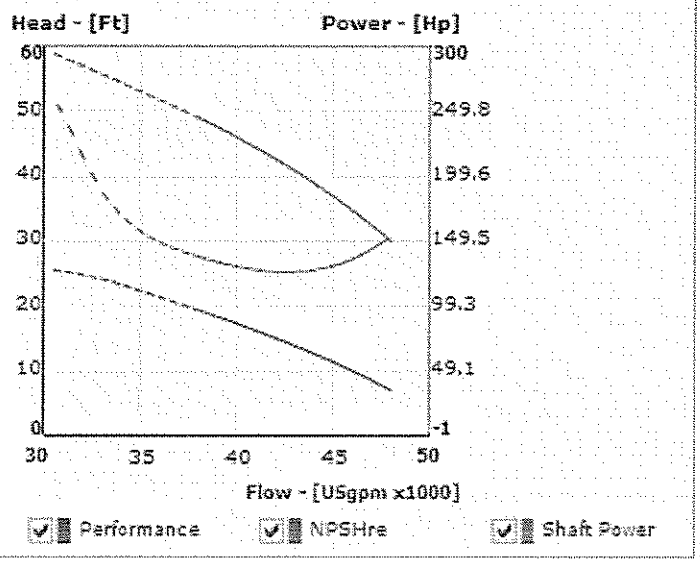
FLYGT

PRODUCT: PL 7101 / 835

Product picture



Curves ⊕ **Enlarge** Available blade angle: 21°



Pump Data

Curve id: 63-590B4 Propeller: 590 Poles: 12 - pole Motor: 54-52-12AA Frequency: 60 Hz

Motor Data

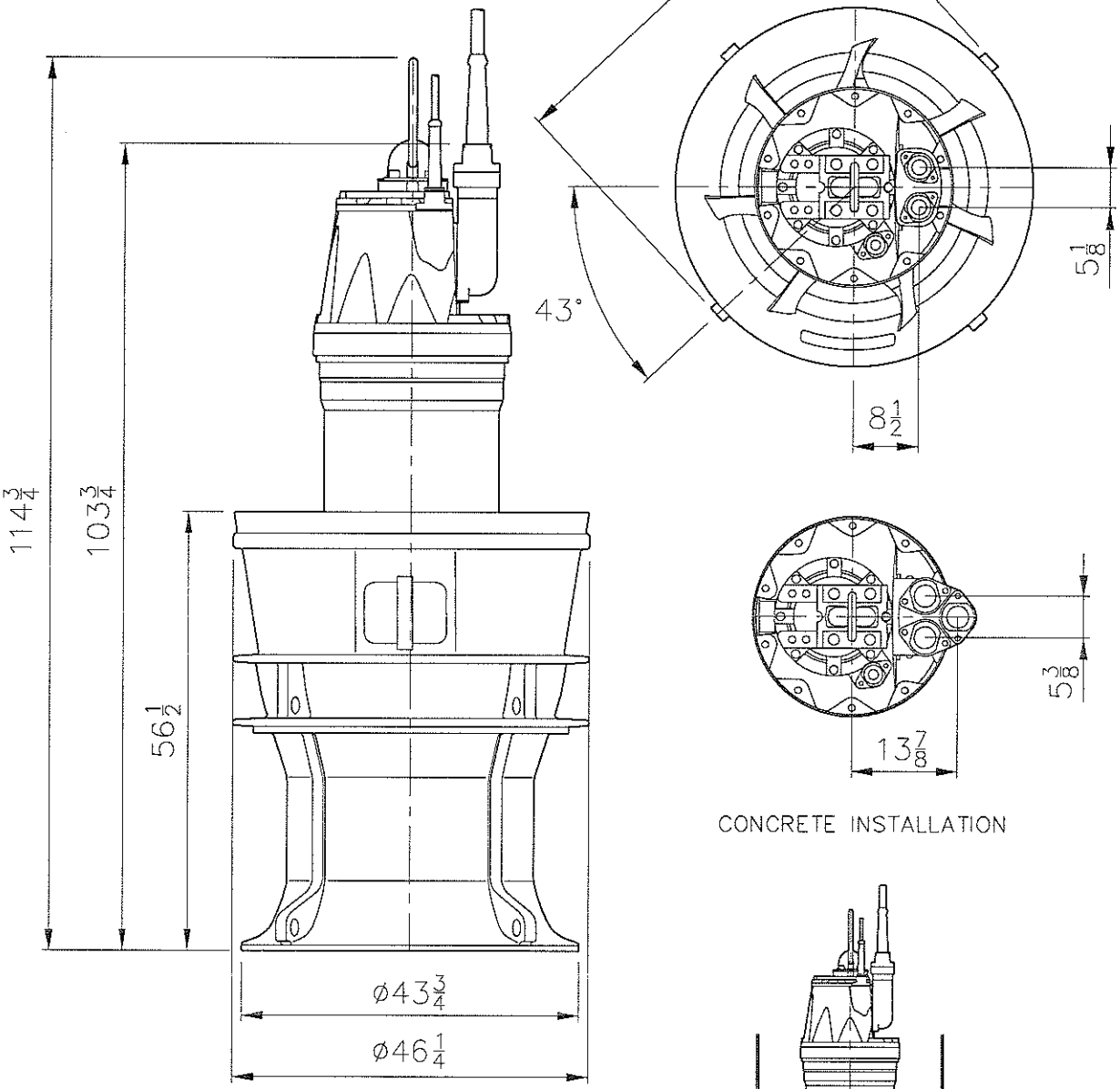
Rated output power Hp (kW)	Ø	Nominal voltage (V)	Full load current (A)	Locked rotor current (A)	Locked rotor kVA	Locked rotor code letter kVA/Hp	Poles/rpm
240 (179)	3	460	375	1500	1194	E	12/590

Pump motor Hp	Efficiency			Power factor		
	100% load	75% load	50% load	100% load	75% load	50% load
240	93	93	92	0.64	0.58	0.47

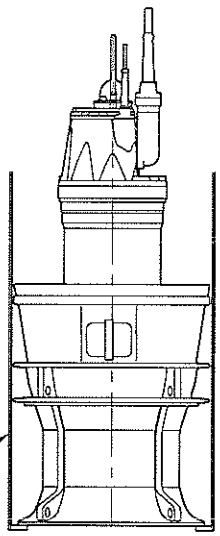
Cable Data

HP	Cables	Volts	Max. length (Ft)	Cable size/Nominal OD.	Conductors (In one cable)	Type	Part number
240	2	460	420	4 G 70 1.85"-(47mm)	(3) 70 mm² (PWR) (1) 70 mm² (GND)	STD	942067
Pilot cable				S12 X 1.5 30.0 mm (1.18")	(12) 1.5 (CTRL)		94 08 94

Engineered for life



CONCRETE INSTALLATION



SEE "FLYGT SYSTEM AND APPLICATION ENGINEERING BULLETIN"

Weight (lbs)
Total
6835

FLYGT AUTOCAD DRAWING	Denomination: Dimensional drwg PL 7101 835/845	Drawn by: ROS	Checked by: LJn	Date: 920301
		Scale:		Reg no: 5799
		5843300		2

Calculations For	Rice Lake New Pumping Station	Job No.	42864-DS-009-001	HNTB	Sheet No. PAGE 1 OF 1
Made by	E. Li	Date	April 20, 2010		
Checked by	M. Hrzic	Date			
Approved by	M. Kennedy	Date			

Red = Input Value
Blue = Input Value From Other Input
Black = Calculated Value

1 DESCRIPTION / PURPOSE

To calculate the piping wall thickness.

2 DESIGN INPUT

(1). Design Temperature = 60 ^{o}F

(2). Design Pressure = (2.1) + (2.2) + (2.3) + (2.4) = 35 psig

(2.1) Pump shutoff head = 25.0 ft

(2.2) Max. suction head = 20.0 ft

(2.3) Water hammer effect in pump discharge line = 100% pump shutoff head = 25.0 ft
(per Waterhammer Analysis, by John Parmakian)

(2.4) Margin = 10.0 ft

3 PIPING WALL THICKNESS CALCULATION

Per ASME B31.3, for piping under internal pressure:

$$t = \frac{PD}{2(SE+PY)}$$

Where: P = Internal Design Pressure = 35 psig
D = Pipe Outside Diameter (in)
S = Stress Value for Material A 53 Grade A @ 100°F per B31.3 Table A-1 = 16,000 psi
E = Quality Factor from Table A-1B = 0.60 (worst case)
Y = Coefficient for t < D/6, from Table 304.1.1 = 0.40

Nominal Pipe Size (in)	42	48
Pipe Sch.	STD	STD
D (in)	42.0	48.0
Min. Req'd (Calculated) Wall Thickness (in), t	0.0756	0.0865
Wall Thickness Used (in)	0.375	0.375
Is Selected Piping Acceptable?	**YES**	**YES**
Max. Allowable Design Pressure (psig)	**173**	**151**

4 CONCLUSION

Since the min. required piping wall thickness is less than the wall thickness used, our selected piping is acceptable.

Calculations For	Rice Lake New Pumping Station	Job No.	42864-DS-009-001	HNTB	Sheet No.
Made by	E. Li	Date	April 15, 2010		PAGE 1
Checked by	J. Wang / M. Hrzic	Date			OF 2
Approved by	M. Kennedy	Date			

Red = Input Value
Blue = Input Value From Other Input
Black = Calculated Value

1 DESCRIPTION / PURPOSE

To calculate the steel/aluminum quantity for trashrack and bulkhead, and estimate the cost.

2 REFERENCES

(1). USACE EM 1110-2-3102
(2). Dwg. Plate 26 and Plate 27
(3). Scope of Work
(4). Rice Lake Pump Station Kickoff Meeting Notes, dated 4/12/2010
(5). Heavy Construction Cost Data, 21st Annual Edition, 2007
(6). Phone Conversation with Alroe Steel Corporation (phone: 517 787 5500), dated 4/16/2010

3 TRASHRACK

3.1 Trashrack Design Criteria

Per Ref. 1:
Velocity thru gross rack area shall not exceed 2.5 fps
Bar spacing shall be between1.75 in and 3 in.

Required trashrack net area at minimum intake elevation:
A = Q/V

Design Case	Number of Pumps	Pump Capacity gpm	Flow cfs	Velocity fps	Required Trashrack Net Area ft^2
#1	3	44,400	99	2.5	40
#2	4	33,300	74	2.5	30

Number of Vertical Bars Required (assuming 1/2" thick x 6" deep flat bar):

Design Case	Number of Pump Bay	Each Pump Bay Width ft	Bar Thickness in.	Bar Depth in.	Bar Spacing in.	Number of Vertical Bars, Each Bay	Total Number of Vertical Bars
#1	3	8.0	0.5	6.0	2.5	33	99
#2	4	8.0	0.5	6.0	2.5	33	132

Net Area at Min. Intake Water Elevation, Each Bay:

Design Case	Sump Floor Elevation ft	Pump Min. Intake (River Flat Pool) Elevation ft	Bar Height at Min. Intake Water Level ft	Total Bar Area at Min. Intake Water Elevation ft^2	Total Gross Area at Min. Intake Water Elevation ft^2	Net Area ft^2	Required Trashrack Net Area ft^2
#1	420.50	429.00	8.5	11.63	68.0	56	40
#2	422.00	429.00	7.0	9.58	56.0	46	30

Number of Horizontal Bars Required (assuming 1" diameter bar, first row is 6" above bottom and last row is 6" below top):

Design Case	Bar Diameter in.	Bar Spacing ft	Trashrack Top Elevation ft	Trashrack Angle to Horizontal deg	Trashrack Height ft	Number of Horizontal Bars
#1	1.0	2.0	439.00	85	18.6	10
#2	1.0	2.0	439.00	85	17.1	9

Cost of Vertical Bars

Design Case	Total Number of Vertical Bars	Trashrack Height ft	Bar Depth in.	S.F of Each Bar ft^2	Total S.F of Vertical Bars ft^2	Unit Price * $/S.F	Cost of Vertical Bars
#1	99	18.6	6.0	9.285	919.25	$27.60	$25,370
#2	132	17.1	6.0	8.532	1,126.29		$31,090

* Per Ref. 5, Section 05 12 23.65 0400, adding 20%

Cost of Horizontal Bars

Design Case	Number of Pump Bay	Each Pump Bay Width ft	Number of Horizontal Bars	Total Length of Horizontal Bars ft	Unit Price * $/12ft	Cost of Horizontal Bars
#1	3	8.0	10	240	$78.08	$1,560
#2	4	8.0	9	289		$1,880

* Per Ref. 6, phone conversation with Alroe Steel Corporation

Trashrack Cost

Design Case	Cost of Vertical Bars	Cost of Horizontal Bars	**Trashrack Cost**
#1	$25,370	$1,560	**$26,930**
#2	$31,090	$1,880	**$32,970**

4 BULKHEAD

Dimensions are Per Ref. 2. Thickness is 2.5".

Bulkhead Cost

Design Case	Number of Bulkheads	Bulkhead Volume, Each ft^3	Total Volume of Bulkhead ft^3	Density of Aluminum lb/ft^3	Unit Price * $/lb	Bulkhead Cost
#1	3	22.34	67.03	165	$8.10	$89,590
#2	4	22.34	89.38			$119,450

* Per Ref. 5, Section 05 14 23.05 0050, adding 20%

To:

Rachel Fellman – USACE, RI

From:

Date:

Copy: File

Subject:

Rice Lake Pump Station

Contract Number:

W912EK-09-D-0007, Task Order 006

Technical Memorandum

Background:

Analysis:

Electrical Design:

The scope of work states that the starting of the pumps be by soft-start VFD controllers. Since there will be no control system to vary the speed of the pumps, and the pumps will always operate at full speed, it is not clear why VFD controllers would be desired except for a smooth startup of the pumps with a reduced voltage dip on the electrical system during starting of the pumps. We propose to use solid-state reduced-voltage (soft-start) controllers for the pumps, which can be programmed to provide a smooth ramp up during starting and ramp down during shutdown of the pumps, and are considerably more cost effective as opposed to VFDs.

The electrical service will be a secondary service provided by Ameren CIPS, with the system voltage being 480/277 volt, 3 phase, 4 wire. Ameren will supply the primary power line to the site, and will also provide, own, and maintain the transformer at the control building. For internal power distribution, a motor control center (MCC) will be designed with a main circuit breaker style service disconnect, three or four (depending on the final quantity of pumps selected) solid-state reduced-voltage (soft-start) controllers for the pumps, plus other feeder breakers and starters as required for the HVAC equipment and other building loads. The MCC will be constructed with tin-plated copper bus, in a NEMA 1 gasketed enclosure. Each MCC starter will be equipped with an integral control power transformer, sized for at least 50 percent spare capacity for future control modifications. All starter pilot lights will be push-to-test, LED type for long life.

There will be a dry-type lighting transformer to step down the voltage from 480 volts to 208/120 volts, three-phase, four-wire. The transformer will be provided with copper windings, and a minimum of two taps above rated voltage and four taps below rated voltage, in 2.5 percent increments. The transformer will be provided with a ventilated, drip-proof enclosure.

There will be a lighting panelboard within the control building. This panelboard will be 208Y/120-volt, three-phase, four-wire, to provide power to all 120- and 208-volt equipment within the pump station. The panelboard will be provided with copper bus and bolt-on type circuit breakers, and will be provided with a NEMA 12 gasketed enclosure.

Power factor correction capacitors will be installed for the pump motors. The capacitors will be controlled by a contactor to be disconnected from the circuit when the starter is "ramping up" during motor starting or "ramping down" during motor stopping. After the motor has reached full speed, and the SCRs of the starter have been shorted out, the contactor will close to energize the capacitors.

The grounding system design will provide for a solidly grounded system in conjunction with both the electrical power distribution system (NFPA 70 – "National Electrical Code," IEEE 142 Green Book) and the instrumentation system (IEEE 1100 Emerald Book) grounding requirements. A grounding ring (counterpoise) will be installed around the pumping station control building, consisting of #4/0 copper grounding electrode conductors connected to ground rods. All connections to the grounding ring (counterpoise) will be made with exothermic weld connections. The submersible pumps will be grounded through their power circuit grounding conductor.

A lightning protection system will be provided to protect the pump station from lightning strikes. The system will be designed in accordance with NFPA 780 – Installation of Lightning Protection Systems.

Surge suppression will be designed for the incoming service entrance using the appropriate level of transient protections as defined in ANSI/IEEE Standard C62.41, Category C requirements, to mitigate the damaging effects to plant electrical equipment as a result of incurred lightning strikes or off-site power line disturbances, including switching surge contributions from a nearby capacitor bank located on the utility distribution system line, and internally generated voltage surges. In addition, a downstream transient voltage surge suppression device will be employed on the lighting panelboard to further protect sensitive equipment from induced transients.

Interior lighting of the pump station control building will utilize high-efficiency, T-8 fluorescent lamps with high power factor electronic ballasts, where possible. Fixture types and enclosure designs will be selected based on the physical, environmental, and aesthetic parameters associated with the area of installation. Interior lights will be controlled by local wall switches. Foot candle illumination levels will be designed based on EM 1110-2-3105 "Mechanical and Electrical Design of Pumping Stations" and the recommendations of Illuminating Engineering Society of North America (IES) for the areas and tasks associated with each facility.

Exit lights will be internally illuminated LED type in order to provide long life and low energy consumption, and will be located within the control building to comply with the requirements of NFPA 101 "Life Safety Code." Emergency means-of-egress lighting will be provided from emergency, 12-volt DC battery-powered lighting units, integral emergency ballasts installed within select fluorescent fixtures, or a combination of both, based on the final design. Emergency lighting will comply with the requirements of NFPA 101 "Life Safety Code."

Exterior lighting will be provided for security and general safety of maintenance personnel. High-pressure, sodium-type lamps/fixtures will be used because of their high efficiency and long life. In most cases, lighting will be provided through the use of building-mounted, vandal-proof perimeter fixtures with limited use of pole-mounted area lights for the submersible pump station area. Exterior lighting will be photocell controlled.

The pump controls will be configured for manual start and stop, with automatic stop provided by a moisture and thermal protection system recommended by the pump manufacturer. Level sensors will be provided for each pump suction bay. High level sensor will be provided to enable pump operation. Low level sensors will disable pump operation. Control points will have a time delay so small fluctuations in river level don't cause them to react. Sensors shall be ultrasonic type.

No signal light for indication of pump operation will be provided, as was requested in the scope of work. DNR will be monitoring the pumps system daily when it is operating.

Preliminary coordination efforts with Ameren are attached.

Melissa Kennedy

From: Michael Nosie
Sent: Friday, April 16, 2010 9:36 AM
To: 'illinoisconstruction@ameren.com'
Subject: New Pump Station Project
Attachments: Project Location Plans.PDF; Pump Sta Plans.pdf

Good Morning,

I spoke with Ashley yesterday about a new project we are starting to design, but was unable to give her a precise location as to where the project was located. The attachments in this email should clarify the location. I need to coordinate the electrical service requirements with one of your engineers.

The project location and preliminary configuration is as shown on the attached pdf documents. I have also been told that there is a new pump station that was designed by another firm presently being constructed approx. 600' to the south of our site. There is a transformer installed on a structure between two poles that serve that facility. So hopefully it will not require much additional work the get a new service for our pump station.

We will need a new electrical service to the Control Building.

The electrical loads are still being evaluated and will consist of either 3 or 4 submersible pumps. In addition, there will be a small amount of building HVAC and lighting loads, but these should be minor as compared to the pumping loads.

If the 3 pump option is selected, each of the three pumps are tentatively selected to be 240 HP, 460V, 3 Phase, 12 pole, 590 rpm motors, with 375 FLA (full load amps) and 1500 LRA (locked rotor amps) and 1194 locked rotor KVA.

If the 4 pump option is selected, each of the four pumps are tentatively selected to be 185 HP, 460V, 3 Phase, 14 pole, 505 rpm motors, with 288 FLA (full load amps) and 1035 LRA (locked rotor amps) and 824 locked rotor KVA.

Could you please pass this information on to the appropriate engineer and have them contact me, so we can begin coordinating service requirements.

Thank you.

Michael W. Nosie, P.E.
Electrical Dept. Manager

HNTB Corporation
111 Monument Circle, Suite 1200
Indianapolis, IN 46204

Tel (317) 636-4682 (Receptionist)
Tel (317) 917-5206 (Direct)
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mnosie@hntb.com

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www.hntb.com

HNTB

To	Fax #
Ameren CIPS Business Dept.	(877) 226-3736
From	**Date**
Michael W. Nosie	04/20/2010

FAX

# of Pages with Cover
6

I spoke with Brauder in the Business Dept., and she suggested I fax this info. I am in the process of doing the electrical design for a new pump station and need to speak with one of your engineers to coordinate the design of the electrical service that will be required.

The project location and preliminary configuration is as shown on the attached documents. I have also been told that there is a new pump station and 24" water force main that was designed by another firm presently being constructed approx. 600' to the south of our site. There is a transformer installed on a structure between two poles that serve that facility. So hopefully it will not require much additional work the get a new service for our pump station.

We will need a new electrical service to the Control Building.

The electrical loads are still being evaluated and will consist of either 3 or 4 submersible pumps. In addition, there will be a small amount of building HVAC and lighting loads, but these should be minor as compared to the pumping loads.

If the 3 pump option is selected, each of the three pumps are tentatively selected to be 240 HP, 460V, 3 Phase, 12 pole, 590 rpm motors, with 375 FLA (full load amps) and 1500 LRA (locked rotor amps) and 1194 locked rotor KVA.

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Could you please pass this information on to the appropriate engineer and have them contact me as soon as possible, so we can begin coordinating the electrical service requirements.

Thank you.

Michael W. Nosie, P.E.
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(317) 917-5206 (Direct)
(317) 917-5211 (FAX)
mnosie@hntb.com

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX J
COST ESTIMATE

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FULTON COUNTY, ILLINOIS

APPENDIX J
COST ESTIMATE

I. INTRODUCTION

This appendix contains a detailed project cost estimate prepared for the Rice Lake Habitat Rehabilitation and Enhancement Project (Project). The proposed Project is located near the town of Banner, in Fulton County, Illinois along the Illinois River. The Project is located in the Rice Lake State Fish and Wildlife Area (SFWA). This Project consists of a number of enhancements to restore wetland, aquatic, and floodplain habitats.

II. PROJECT DESCRIPTION

The proposed Project is located in the Rice Lake SFWA which is approximately 24 miles southwest of Peoria, IL. The Project involves the construction of a perimeter water control spillway, a pump station and conveyance channel, two fish egress structures, as well as mast-tree and native wet meadow/grassland plantings. Also part of the Project scope is the conversion of an existing pump station to a water control structure and the removal of another pump station.

A. Fish and Wildlife Facilities

1. Fish Egress Structures. Two fish egress structures will be constructed of reinforced concrete. One will be located under the perimeter water control spillway while the other will be located under an existing gravel road between Rice Lake and the quarry pit on Duck Island. They will both be strong enough to hold vehicular traffic and will have two bays in each to allow for shorter stoplogs.

2. Vegetation Plantings. Mast-tree plantings will occur on 352 acres of Duck Island and another 57 acres of Duck Island will be planted with wet meadow/grassland plantings. Trees will be planted with a 10 foot x 10 foot maximum spacing, and grasses will be planted between the trees. Different tree species will be intermixed among the rows. Grasses will be planted that are native to the area and can withstand flooding.

B. Discharge Channel. A 7,000-foot discharge channel will be constructed to convey the discharged water from the new pump station to allow water management of Rice Lake, Big Lake, Goose Lake, and the Voorhees Unit. The channel will be constructed adjacent to an existing road embankment. A berm will be constructed opposite the existing embankment using some of the excavated material from the channel.

C. Pumping Plant

1. New Pump Station. A new reinforced concrete pump station will be constructed upstream of the old Copperas Creek lock. It will contain three pumps with a pumping capacity of 133,200 gallons per minute. The pump station will be constructed on 70-foot long timber piles. The pump station intake will have trash racks to keep debris from entering the pumping system. Steel discharge pipes will run under the existing road to the outlet structure, which is also made of reinforced concrete. An elevated control building will be constructed of concrete masonry units. A gravel access road will be constructed to allow access to the pump station and the existing road will be repaired after backfilling over the discharge pipes.

2. Work to Existing Voorhees Pump Station. The work at the existing Voorhees pump station consists of the removal of the existing pump and slide gate, and replacement of the existing corrugated metal pipe (CMP). It will then be converted into a water control structure with a flap gate on one end and a slide gate on the other.

3. Removal of Existing Rice Lake Pump Station. The existing Rice Lake pump station will be removed. The pumps will be salvaged by the Illinois Department of Natural Resources (ILDNR). The structure will be removed to 2 feet below the ground surface and filled with sand. A concrete cap will be placed over the top of the structure. The discharge pipes will be capped and left in place under the existing access bridge.

D. Floodway Control and Diversion Structures

1. Perimeter Water Control Spillway. The perimeter water control spillway will be constructed in both the wet and the dry. The portion in the wet will be constructed using a crane with a clamshell bucket to excavate from Goose Lake. The material will be wet and will need time to settle before starting work on the remainder of the spillway. The portion in the dry will be constructed of excess material hauled from the excavation of the discharge channel. Material will be trucked from the channel excavation and placed and shaped on the existing ground to either side of the portion of the spillway constructed in the wet. The perimeter water control spillway constructed in the wet will have to be completed prior to the construction of the spillway in the dry, as there is currently no access to this area. Riprap erosion protection will be placed on a portion of the spillway once it is constructed, with the remainder to be seeded.

2. Water Control Structures. Four water control structures will be constructed. They will be constructed along the discharge channel to allow water management of the adjacent lakes. Three of the structures will have CMP risers with stoplogs while two of the structures will have Agridrain ® or

similar type structures. Trash racks will be on both ends of the CMP inlet and outlet pipes. The tops of the risers will be secured with steel lids and ladders will allow access to the bottom of the riser.

3. Gatewell Structure. The gatewell structure will be constructed at the lower end of the perimeter water control spillway. The gatewell would be constructed of 60-inch reinforced concrete pipe. A concrete structure will be constructed in the middle that contains a sluice gate.

III. COST METHODOLOGY

A. General. This Fully Funded Estimate (FFE) has been prepared to October 2010 price levels. The costs are considered to be fair and reasonable to a well-equipped and capable contractor and include overhead and profit. The preparation of this estimate was created in accordance with Engineering Regulation (ER) 1110-1-1300 – *Cost Engineering Policy and General Requirements, (26 March 1993)* and ER 1110-2-1302 – *Civil Works Cost Engineering, (15 September 2008*". The FFE was completed in accordance with Engineering Manual 1110-2-1304 – *Civil Works Construction Cost Index System (CWCCIS), (revised 30 September 2010).*

The estimate was developed using Micro Computer Aided Cost Estimate System MII v4.0 cost estimating software. Applicable crews and equipment were applied in the estimate to correspond with the work being performed. Material prices were developed using the MII Cost Book, R.S. Means references, and quotes obtained from suppliers. The midpoint of construction is anticipated to be the 1st quarter of 2013, and was used to determine the FFE. The MII report of the Work Breakdown Structure can be found in Appendix J-1.

B. Direct Costs. Direct costs are based on the anticipated material, equipment, and labor needed to construct the Project based on the current scope of work. Material quotes were obtained for the major cost items. Direct costs were calculated independent of the contractor assigned to perform the work. Contractor assignments were determined after the formulation of the direct costs.

1. Labor-Rate Determination. Labor Rates are based on 2010 Davis-Bacon Wage Rates general decisions IL20080014 and IL20080001.

2. Equipment Rates. All equipment costs are from MII Equipment Region 5r 2007 and MII English Cost Book 2008.

3. Fuel Rates. Rates have been updated as of Monday, October 18, 2010. Current fuel prices, including gasoline, on-road diesel, and off-road diesel are based on Midwest averages from http://www.eia.doe.gov/.

4. Overtime Considerations. Overtime was considered and deemed not necessary due to the durations of the Project stages; therefore, it was not applied in the estimate.

5. Sales Tax. Local taxes will not be applied since sales taxes are not applied to Federal projects in Illinois.

6. Productivity. Production rates were not adjusted.

C. Indirect Costs

1. Prime Contractor

a. Job Office Overhead. Rates for job office overhead were calculated by itemizing the costs that the contractor will likely incur which could not be placed in a specific category of the estimate. The calculated value applied to the prime contractor's work is 7.3 percent. In addition, a 2 percent charge for small tools is applied based on the prime contractor's labor cost.

b. Home Office Overhead. Rates for home office overhead were applied as a running percentage. In this case, a value of 8 percent was applied for the prime contractor. Home office overhead includes such items as office rental/ownership costs, utilities, office equipment ownership/maintenance, office staff (managers, accountants, clerical, etc.), insurance, and miscellaneous costs. In reality, the range of home office overhead can be quite broad and depends largely on the contractor's annual volume of work and the type of work that is generally performed by the contractor.

c. Profit. Profit has been included as a percentage. In this case, a value of 10 percent was assumed for the prime contractor.

d. Bond. Bond was included as a running percentage of 2 percent (own work and subcontracted work).

e. Insurance. Insurance was included as a running percentage of 3 percent.

2. Subcontractors

a. Job Office Overhead. Rates for job office overhead were applied as a running percentage. In this case, a value of 6 percent was applied for the subcontractors.

b. Home Office Overhead. Rates for home office overhead were applied as a running percentage. In this case, a value of 8 percent was applied for the subcontractors.

c. Profit. Profit has been included as a percentage. In this case, a value of 10 percent was assumed for the subcontractors.

d. Insurance. Insurance was included as a running percentage of 3 percent.

D. Escalation. The Project costs have been escalated to the midpoint of construction, assumed to be the 1st quarter of 2013.

E. Contingency. After review of Project documents and discussion with members of the Project Development Team involved in the design of the Project, an informal risk analysis was conducted resulting in the development of a contingency. This contingency was developed reflecting the uncertainty associated with the work features. The contingency for real estate was provided by the Rock Island District's Real Estate Division. The contingency matrix is shown in Appendix J-2.

F. Other Assumptions

1. Mobilization. Equipment needs were identified from work items in the MII estimate. Equipment was assumed to be mobilized within 200 miles. Different periods for mobilization created based on the construction schedule.

2. Government Furnished Materials. The estimate is based on no government furnished materials.

3. Weather Inefficiency. There are no weather inefficiency markups/delays expected, except for the contactor not working at the site during the months of December, January, and February.

4. Site Access. The Project site is accessible 365 days a/year except in the event of a flood. It is assumed that the site will not be accessed during the months of December, January, and February.

5. Waste Disposal. Construction debris and waste from the Rice Lake pump station removal will be hauled to Frietsch Landfill in Peoria, Illinois. Cleared and grubbed material will be left on site.

6. Earthwork Factors. Swell factor of 1.25 percent used. Shrink factor of 0.93 percent used.

IV. PROJECT FEATURE ACCOUNTS

A. (01) Lands and Damages. This account contains the required real estate costs that must be obtained to proceed with the Project.

B. (06) Fish and Wildlife Facilities. The construction of two fish egress structures as well as the mast-tree and native wet meadow/grassland planting is covered in this account.

C. (09) Channels and Canals. This account covers the excavation of the discharge channel and construction of the berm adjacent to the channel.

D. (13) Pumping Plant. This account covers the construction of the new pump station as well as the conversion of the existing Voorhees pump station and removal of the existing Rice Lake pump station.

E. (15) Floodway Control and Diversion Structures. The construction of the perimeter water control spillway, four separate stoplog water control structures, and a gatewell structure are covered in this account.

F. (30) Planning, Engineering, and Design. The work covered under this account includes the project management, engineering, and design costs spent to date as well as the remaining estimated costs that will be associated with the engineering and design for this Project.

G. (31) Construction Management. The work covered under this account includes the expected costs for contract supervision, contract and construction administration, technical management activities, district office supervision, and administration costs.

V. PROJECT SCHEDULE

The estimated duration of the Project is 24 months, which is based on the construction schedule. The schedule was created following the durations for crews and equipment in the MII estimate. Additional crews were provided for certain earthwork tasks to speed up the schedule. There are no additional costs for the work based on adding another crew or piece of equipment to a task, although there are additional mobilization and demobilization costs which were included in the estimate. This can be found in Appendix J-3.

VI. TOTAL PROJECT COST SUMMARY

The total Project cost prior to being fully funded is $18,469,000.00 (Constant Dollars). The total fully funded Project cost is $20,763,000.00 at 2011 fiscal year pricing. Based on the construction schedule, work will commence in October 2011. Cost-sharing between the U.S. Army Corps of Engineers and the non-Federal Sponsor (the ILDNR) is 65/35 percent. The Total Project Cost Summary is included as Appendix J-4.

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX J-1
MII COST ESTIMATE

Rice Lake ATR
See notes in Notes Section of Project Properties for a detailed project overview.

Estimated by	Garrett Mattila
Designed by	CEMVR-EC-DN (Rachel Fellman)
Prepared by	CEMVR-EC-TE
Preparation Date	6/14/2010
Effective Date of Pricing	6/14/2010
Estimated Construction Time	Days

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
Project Owner Summary			7,260,708	0	7,260,708
Rice Lake EMP	LS	1	7,260,708	0	7,260,708
-06 Fish and Wildlife Facilities	LS	1	1,081,333	0	1,081,333
Fish Egress Structures	LS	1	319,098	0	319,098
Mobilization	LS	1	6,316	0	6,316
Rice Lake	LS	1	157,541	0	157,541
Big Lake	LS	1	155,241	0	155,241
Terrestrial Vegetation	LS	1	762,234	0	762,234
Mobilization	LS	1	5,962	0	5,962
Mast Tree Plantings	LS	1	685,842	0	685,842
Warm Season Grass Plantings	LS	1	70,430	0	70,430
-09 Channels and Canals	LS	1	1,256,803	0	1,256,803
Discharge Channel	LS	1	1,256,803	0	1,256,803
Mobilization	LS	1	39,400	0	39,400
Surveying	LS	1	41,521	0	41,521
Clearing and Grubbing	LS	1	139,661	0	139,661
Strip Material	LS	1	62,975	0	62,975
Dewatering at Slim Lake	LS	1	1,533	0	1,533
Channel Excavation	LS	1	142,872	0	142,872
Construct Levee	LS	1	360,074	0	360,074
Riprap Erosion Protection	LS	1	338,288	0	338,288
Articulated Concrete Block Mat	LS	1	46,801	0	46,801
Seeding	LS	1	83,678	0	83,678
-13 Pumping Plant	LS	1	2,775,561	0	2,775,561
New Pump Station	LS	1	2,692,561	0	2,692,561
Mobilization	LS	1	39,066	0	39,066
Clearing and Grubbing	LS	1	8,779	0	8,779
Strip Material	LS	1	2,979	0	2,979
Pump Station Access Road	LS	1	23,518	0	23,518
Cofferdam	LS	1	186,412	0	186,412

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
Pump Station Structure	LS	1	594,652	0	594,652
Pumps	LS	1	784,667	0	784,667
Control Building	LS	1	297,012	0	297,012
Discharge Pipes	LS	1	700,572	0	700,572
Outlet Structure	LS	1	48,179	0	48,179
Reconstruct Road	LS	1	5,505	0	5,505
Seeding	LS	1	1,221	0	1,221
Work to Existing Voorhees Pump Station	LS	1	44,684	0	44,684
Mobilization	LS	1	6,316	0	6,316
Pump Removal	LS	1	2,669	0	2,669
Pipe Replacement	LS	1	15,359	0	15,359
Install New Gates	LS	1	14,362	0	14,362
Riprap Erosion Protection	LS	1	3,113	0	3,113
Reconstruct Road	LS	1	2,864	0	2,864
Removal of Existing Rice Lake Pump Station	LS	1	38,315	0	38,315
Mobilization	LS	1	6,316	0	6,316
Electrical Removal	LS	1	8,861	0	8,861
Building Removal	LS	1	2,440	0	2,440
Pump Removal	LS	1	5,077	0	5,077
Cap 36" pipes	LS	1	3,083	0	3,083
Fill and Cap Pump Station	LS	1	12,538	0	12,538
-15 Floodway Control and Diversion Structures	LS	1	2,147,011	0	2,147,011
Overflow Spillway	LS	1	1,718,451	0	1,718,451
Constructed in the Wet	LS	1	1,395,722	0	1,395,722
Constructed in the Dry	LS	1	322,729	0	322,729
Water Control Structures	LS	1	283,521	0	283,521
Mobilization	LS	1	5,291	0	5,291
(2) 24" at Voorhees Unit	LS	1	45,835	0	45,835
(2) 24" at Slim Lake	LS	1	32,190	0	32,190
(3) 48" at Big Lake	LS	1	95,993	0	95,993

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
(3) 48" at Rice Lake	LS	1	104,212	0	104,212
Gatewell Structure	LS	1	145,039	0	145,039
Mobilization	LS	1	15,464	0	15,464
Excavation	LS	1	5,731	0	5,731
Gravel Fill	LS	1	623	0	623
Reinforced Concrete Pipe	LS	1	46,111	0	46,111
Sluice Gate Structure	LS	1	28,157	0	28,157
Fabricated Steel	LS	1	4,348	0	4,348
Sluice Gate	LS	1	39,442	0	39,442
Backfill and Compaction	LS	1	1,884	0	1,884
Crushed Stone	LS	1	166	0	166
Riprap Erosion Protection	LS	1	3,113	0	3,113

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APPENDIX J-2
CONTINGENCY DETERMINATION

Rice Lake ATR - **PROJECT < $40M**
Project Development Stage: Feasibility
Informal Risk Analysis

WBS	Item	Contract Cost	*Test Methods of Calculations* % Contng.	Wght % Contg.	Wght Avr Contng.	Contingency	Contingency	Contingency	Total	Total	Total
06	Fish Egress Structures	$ 325,366	20.00%	16.67%	25.0%	$ 65,071.18	$ 54,225.98	$ 81,338.98	$ 390,427.06	$ 379,581.88	$ 406,694.88
05	Terrestrial Vegetation	$ 716,608	2.50%	2.08%	3.1%	$ 17,915.21	$ 14,929.34	$ 22,394.01	$ 734,523.49	$ 731,537.62	$ 739,002.29
09	Discharge Channel	$ 1,179,535	22.50%	18.75%	28.1%	$ 265,395.34	$ 221,162.78	$ 331,744.17	$ 1,444,930.18	$ 1,400,697.62	$ 1,511,279.01
13	New Pump Station	$ 2,662,169	30.00%	25.00%	37.5%	$ 798,650.77	$ 665,542.31	$ 998,313.47	$ 2,662,169	$ 3,327,711.55	$ 3,660,482.71
13	Work to Existing Voorhees Pump Station	$ 44,269	2.50%	3.13%	3.1%	$ 1,106.49	$ 1,383.11	$ 1,383.11	$ 45,385.98	$ 45,642.60	$ 45,642.60
13	Removal of Existing Rice Lake Pump Station	$ 37,883	2.50%	3.13%	3.1%	$ 947.06	$ 1,183.83	$ 1,183.83	$ 38,829.60	$ 39,066.37	$ 39,066.37
15	Overflow Spillway	$ 1,738,636	45.00%	37.50%	56.3%	$ 782,386.22	$ 651,988.52	$ 977,982.77	$ 2,521,022.26	$ 2,390,624.56	$ 2,716,618.81
15	Water Control Structures	$ 283,870	12.50%	10.42%	15.6%	$ 35,483.69	$ 29,569.74	$ 44,354.61	$ 319,353.19	$ 313,439.24	$ 328,224.11
15	Gatewell Structure	$ 144,759	17.50%	14.58%	21.9%	$ 25,332.75	$ 21,110.62	$ 31,665.93	$ 170,091.30	$ 165,869.17	$ 176,424.48
	-		0.00%	0.00%	0.0%	$ -	$ -	$ -	$ -	$ -	$ -
	-		0.00%	0.00%	0.0%	$ -	$ -	$ -	$ -	$ -	$ -
	-		0.00%	0.00%	0.0%	$ -	$ -	$ -	$ -	$ -	$ -
	-		0.00%	0.00%	0.0%	$ -	$ -	$ -	$ -	$ -	$ -
	-		0.00%	0.00%	0.0%	$ -	$ -	$ -	$ -	$ -	$ -
	0%					$ 1,992,289	$ 1,661,096	$ 2,490,361	Total: $ 8,326,712	$ 8,794,171	$ 9,623,435

Total Construction Estimate $ 7,133,074

Weighted Contingency	=	27.9%
Weighted Contingency	=	23.3%
Weighted Contingency	=	34.9%
Average Weighted Contingency	=	28.7%

Rice Lake ATR
Project Development Stage:
Informal Risk Analysis

Meeting Date: 23-Nov-10

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4

Risk Element	Concerns	Affected WBS Item	PDT Discussions	Likelihood	Impact	Risk Level
Project Scope						
PS-1	Design change possible.	Fish Egress Structures	May be constructed using different materials.	Likely	Negligible	1
PS-2	None.	Terrestrial Vegetation		Very Unlikely	Negligible	0
PS-3	None.	Discharge Channel		Very Unlikely	Negligible	0
PS-4	Designed only to level of pumping gallons/minute, so not fully designed with all components laid out, although costs for some mech/elec are covered in the estimate.	New Pump Station	There is the possibility that misc. costs such as electrical or mechanical design could result in significant cost increases.	Unlikely	Significant	3
PS-5	N/A.	Work to Existing Voorhees Pump Station		Very Unlikely	Negligible	0
PS-6	N/A.	Removal of Existing Rice Lake Pump Station		Very Unlikely	Negligible	0
PS-7	Large cost increase could result from design change.	Overflow Spillway	Small possibility that spillway protection could be changed from riprap to articulated mat.	Unlikely	Significant	3
PS-8	None.	Water Control Structures		Very Unlikely	Negligible	0
PS-9	None.	Gatewell Structure		Very Unlikely	Negligible	0
Acquisition Strategy						
AS-1	Assumed IFB, but possible that this could be a small business contract.	Fish Egress Structures		Unlikely	Marginal	1
AS-2	Assumed IFB, but possible that this could be a small business contract.	Terrestrial Vegetation	Possible that LEERDS value decreases total land value.	Unlikely	Marginal	1
AS-3	Assumed IFB, but possible that this could be a small business contract.	Discharge Channel	Would have the highest increase in total project cost based on overall construction cost.	Unlikely	Significant	3

AS-4	Assumed IFB, but possible that this could be a small business contract.	New Pump Station	Would have the highest increase in total project cost based on overall construction cost.	Unlikely	Significant	3
AS-5	Assumed IFB, but possible that this could be a small business contract.	Work to Existing Voorhees Pump Station		Unlikely	Negligible	0
AS-6	Assumed IFB, but possible that this could be a small business contract.	Removal of Existing Rice Lake Pump Station		Unlikely	Negligible	0
AS-7	Assumed IFB, but possible that this could be a small business contract.	Overflow Spillway	Would have the highest increase in total project cost based on overall construction cost.	Unlikely	Significant	3
AS-8	Assumed IFB, but possible that this could be a small business contract.	Water Control Structures		Unlikely	Marginal	1
AS-9	Assumed IFB, but possible that this could be a small business contract.	Gatewell Structure		Unlikely	Marginal	1
Construction Complexity						
CC-1	Roads leading to structures may be in poor conditions during part of the year.	Fish Egress Structures	May result in gravel or other work being done to the project beyond already anticipated costs.	Likely	Negligible	1
CC-2	None.	Terrestrial Vegetation		Very Unlikely	Negligible	0
CC-3	None.	Discharge Channel		Very Unlikely	Negligible	0
CC-4	Construction shouldn't be too complex as these are typically constructed in the district.	New Pump Station		Unlikely	Marginal	1
CC-5	N/A.	Work to Existing Voorhees Pump Station		Very Unlikely	Negligible	0
CC-6	N/A.	Removal of Existing Rice Lake Pump Station		Very Unlikely	Negligible	0
CC-7	Distance in hauling bedding stone and riprap. May have to truck farther, although current estimate assumes trucking from a large distance already.	Overflow Spillway	Finding a Corps approved quarry close by is a challenge.	Unlikely	Significant	3
CC-8	None.	Water Control Structures		Very Unlikely	Negligible	0
CC-9	Might need dewatering protection.	Gatewell Structure	More complex than some other features.	Likely	Negligible	1
Volatile Commodities						
VC-1	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Fish Egress Structures		Very Unlikely	Negligible	0

VC-2	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Terrestrial Vegetation		Very Unlikely	Negligible	0
VC-3	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Discharge Channel		Very Unlikely	Negligible	0
VC-4	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	New Pump Station	Material quotes are current.	Very Unlikely	Negligible	0
VC-5	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Work to Existing Voorhees Pump Station		Very Unlikely	Negligible	0
VC-6	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Removal of Existing Rice Lake Pump Station		Very Unlikely	Negligible	0
VC-7	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Overflow Spillway	Material quotes are current.	Very Unlikely	Negligible	0
VC-8	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Water Control Structures		Very Unlikely	Negligible	0
VC-9	No concern regarding commodities as there are no large quantities of volatile items that will be used in the project.	Gatewell Structure		Very Unlikely	Negligible	0
Quantities						
Q-1	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Fish Egress Structures		Very Unlikely	Negligible	0
Q-2	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Terrestrial Vegetation		Very Unlikely	Marginal	0
Q-3	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Discharge Channel		Very Unlikely	Significant	1
Q-4	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	New Pump Station		Very Unlikely	Critical	2
Q-5	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Work to Existing Voorhees Pump Station		Very Unlikely	Negligible	0
Q-6	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Removal of Existing Rice Lake Pump Station		Very Unlikely	Negligible	0
Q-7	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Overflow Spillway		Very Unlikely	Significant	1
Q-8	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Water Control Structures		Very Unlikely	Negligible	0
Q-9	Quantity's are well defined based on the plans. Waste and shrink/swell were included where necessary.	Gatewell Structure		Very Unlikely	Negligible	0

Fabrication & Project Installed Equipment						
FI-1	None.	Fish Egress Structures	Stoplogs have to be created, there is some on-site fabrication.	Very Unlikely	Marginal	0
FI-2	None.	Terrestrial Vegetation		Very Unlikely	Negligible	0
FI-3	None.	Discharge Channel		Very Unlikely	Negligible	0
FI-4	None.	New Pump Station	All items are readily available.	Very Unlikely	Marginal	0
FI-5	None.	Work to Existing Voorhees Pump Station		Very Unlikely	Negligible	0
FI-6	None.	Removal of Existing Rice Lake Pump Station		Very Unlikely	Negligible	0
FI-7	None.	Overflow Spillway		Very Unlikely	Negligible	0
FI-8	None.	Water Control Structures		Very Unlikely	Negligible	0
FI-9	None.	Gatewell Structure		Very Unlikely	Negligible	0
Cost Estimating Method						
CE-1	Cofferdams and dewatering may be needed to construct this.	Fish Egress Structures	Assumed that it will be constructed during low water.	Unlikely	Significant	3
CE-2	It may be too cold to plant trees or grass depeding on the season.	Terrestrial Vegetation	Could be done the following year.	Unlikely	Negligible	0
CE-3	Construction of the spillway doesn't happen concurrently with the excavation of the discharge channel.	Discharge Channel	Excavated material may need to be stockpiled after excavation.	Unlikely	Marginal	1
CE-4	Assumptions made in that control building and controls are similar to other constructed pump stations. Also misc costs may not be included.	New Pump Station	Minor additional costs not considered such as detailed electrical and mechanical systems.	Unlikely	Marginal	1
CE-5	None.	Work to Existing Voorhees Pump Station		Very Unlikely	Negligible	0
CE-6	None.	Removal of Existing Rice Lake Pump Station	Used plans of existing structure to determine removal cost.	Very Unlikely	Negligible	0
CE-7	Assumed method of construction of spillway in the wet couldn't be completed using crane with clamshell bucket.	Overflow Spillway	Would result in use of barge.	Likely	Significant	4

CE-8	Cofferdams and dewatering may be needed to construct this.	Water Control Structures	Assumed that it will be constructed during low water.	Unlikely	Significant	3
CE-9	Cofferdams and dewatering may be needed to construct this.	Gatewell Structure	Assumed that it will be constructed during low water.	Unlikely	Significant	3
External Project Risks						
EX-1	Flooding is very possible.	Fish Egress Structures	These are located on the Illinois River and are susceptible to flooding if it occurs.	Very Likely	Negligible	2
EX-2	Flooding is very possible.	Terrestrial Vegetation	This is on high ground, flooding damage unlikely.	Very Unlikely	Negligible	0
EX-3	Flooding is very possible.	Discharge Channel	If work has already been started if flooding occurs, it is likely that rework may need to be done.	Likely	Significant	4
EX-4	Flooding is very possible.	New Pump Station	If work has already been started if flooding occurs, it is likely that rework may need to be done.	Likely	Marginal	2
EX-5	Flooding is very possible.	Work to Existing Voorhees Pump Station	If work has already been started if flooding occurs, it is likely that rework may need to be done.	Likely	Negligible	1
EX-6	Flooding is very possible.	Removal of Existing Rice Lake Pump Station	If work has already been started if flooding occurs, it is likely that rework may need to be done.	Likely	Negligible	1
EX-7	Flooding is very possible.	Overflow Spillway	These is next to the Illinois River and are susceptible to flooding if it occurs.	Very Likely	Significant	4
EX-8	Flooding is very possible.	Water Control Structures	If work has already been started if flooding occurs, it is likely that rework may need to be done.	Likely	Negligible	1
EX-9	Flooding is very possible.	Gatewell Structure	.	Very Likely	Negligible	2

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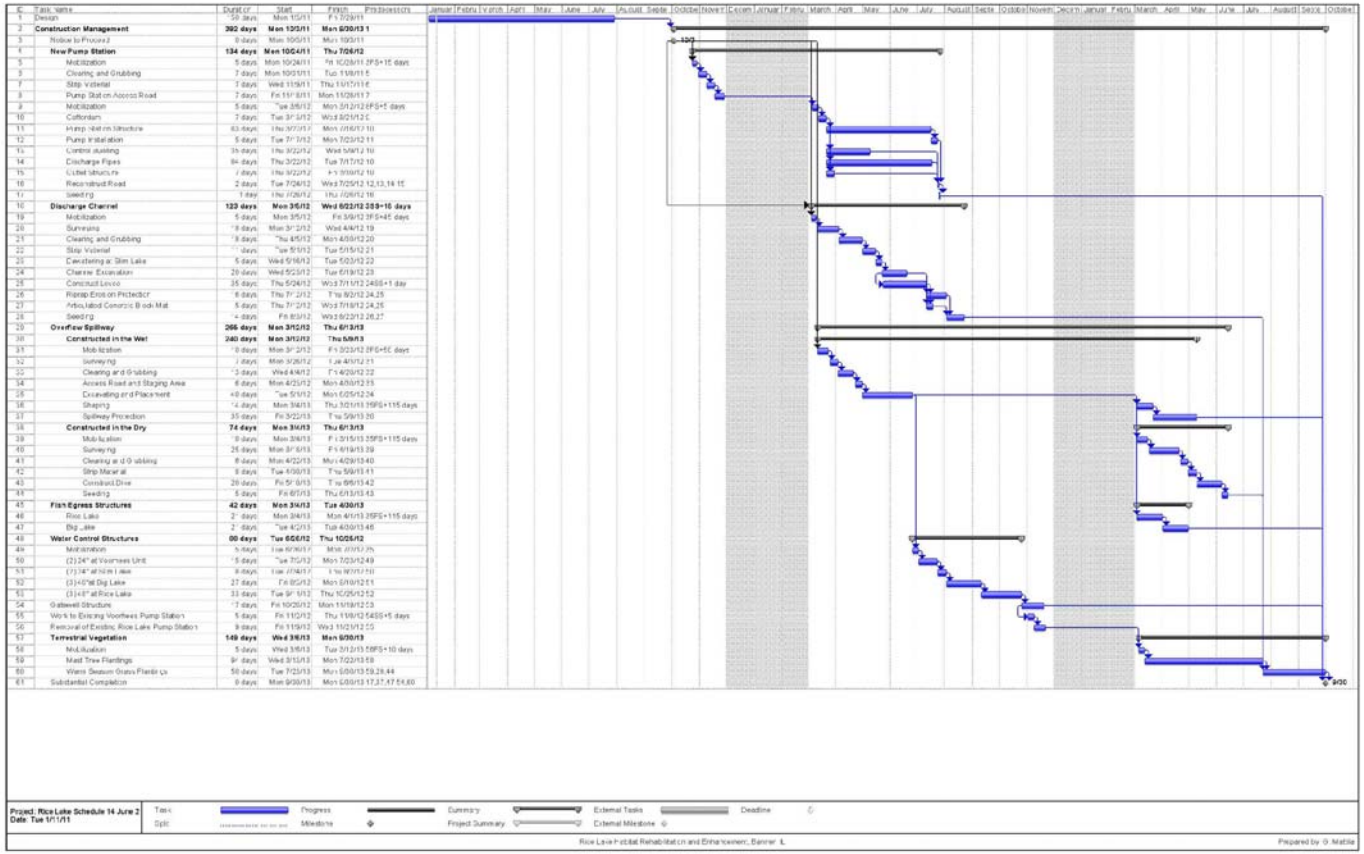
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX J-3

PROJECT SCHEDULE



UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX J-4

TOTAL PROJECT COST SUMMARY

****** TOTAL PROJECT COST SUMMARY ******

PROJECT: Rice Lake Habitat Rehabilitation and Enhancement
LOCATION: Banner, IL

DISTRICT: Rock Island PREPARED: 11/1/2010
POC: CHIEF, COST ENGINEERING, Charles R. Van Laarhoven

This Estimate reflects the scope and schedule in report; Upper Mississippi River System Environmental Management Program Definite Project Report with Integrated Environmental Assessment (R-17F)

Program Year (Budget EC): 2011
Effective Price Level Date: 1 OCT 10

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE Spent Thru: 30-Sep-10 ($K)	L	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
06	FISH & WILDLIFE FACILITIES	$1,081	$310	29%	1,392	0.0%	$1,081	$310	$1,392	$0		$1,115	$320	$1,435
09	CHANNELS & CANALS	$1,257	$361	29%	1,618	0.0%	$1,257	$361	$1,618	$0		$1,296	$372	$1,668
13	PUMPING PLANT	$2,776	$797	29%	3,572	0.0%	$2,776	$797	$3,572	$0		$2,862	$821	$3,684
15	FLOODWAY CONTROL & DIVERSION STF	$2,147	$616	29%	2,763	0.0%	$2,147	$616	$2,763	$0		$2,214	$635	$2,850
	CONSTRUCTION ESTIMATE TOTALS:	$7,261	$2,084		**9,345**	0.0%	$7,261	$2,084	$9,345	$0		$7,488	$2,149	$9,637
01	LANDS AND DAMAGES	$6,493	$972	15%	7,465	0.0%	$6,493	$972	$7,465	$0		$6,587	$986	$7,573
30	PLANNING, ENGINEERING & DESIGN	$900	$99	11%	999	0.0%	$900	$99	$999	$1,819		$925	$102	$2,846
31	CONSTRUCTION MANAGEMENT	$600	$60	10%	660	0.0%	$600	$60	$660	$0		$643	$64	$707
	PROJECT COST TOTALS:	$15,254	$3,215	21%	**18,469**	0.0%	$15,254	$3,215	$18,469	$1,819		$15,643	$3,301	$20,763

Charles R. Van Laarhoven
CHIEF, COST ENGINEERING, Charles R. Van Laarhoven

PROJECT MANAGER, Darron L. Niles

CHIEF, REAL ESTATE, Stuart P. Jackson

CHIEF, PLANNING,xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING,xxx

CHIEF, PM-PB, xxxx

CHIEF, DPM, xxx

ESTIMATED FEDERAL COST:	65%	**$13,496**
ESTIMATED NON-FEDERAL COST:	35%	**$7,267**
ESTIMATED TOTAL PROJECT COST:		**$20,763**

Filename: FINAL Rice Lake TPCS 2 Jan GPM JGN Review.xlsx
TPCS

****** TOTAL PROJECT COST SUMMARY ******

****** CONTRACT COST SUMMARY ******

PROJECT: Rice Lake Habitat Rehabilitation and Enhancement
LOCATION: Banner, IL
This Estimate reflects the scope and schedule in report; Upper Mississippi River System Environmental Management Program Definite Project Report with Integrated Environmental Assessment (R-17F)

DISTRICT: Rock Island PREPARED: 11/1/2010
POC: CHIEF, COST ENGINEERING, Charles R. Van Laarhoven

Estimate Prepared: 1-Nov-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2011
Effective Price Level Date: 1 OCT 10

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	PHASE 1													
06	FISH & WILDLIFE FACILITIES	$1,081	$310	29%	$1,392	0.0%	$1,081	$310	$1,392	2013Q1	3.1%	$1,115	$320	$1,435
09	CHANNELS & CANALS	$1,257	$361	29%	$1,618	0.0%	$1,257	$361	$1,618	2013Q1	3.1%	$1,296	$372	$1,668
13	PUMPING PLANT	$2,776	$797	29%	$3,572	0.0%	$2,776	$797	$3,572	2013Q1	3.1%	$2,862	$821	$3,684
15	FLOODWAY CONTROL & DIVERSION STR	$2,147	$616	29%	$2,763	0.0%	$2,147	$616	$2,763	2013Q1	3.1%	$2,214	$635	$2,850
	CONSTRUCTION ESTIMATE TOTALS:	$7,261	$2,084	29%	**$9,345**		$7,261	$2,084	$9,345			$7,488	$2,149	$9,637
01	LANDS AND DAMAGES	$6,493	$972	15%	$7,465	0.0%	$6,493	$972	$7,465	2012Q1	1.4%	$6,587	$986	$7,573
30	PLANNING, ENGINEERING & DESIGN					0.0%					0.0%			
0.0%	Project Management	$0	$0	11%	$0	0.0%	$0	$0	$0	2011Q3	1.5%	$0	$0	$0
0.0%	Planning & Environmental Compliance	$0	$0	11%	$0	0.0%	$0	$0	$0	2011Q3	1.5%	$0	$0	$0
0.0%	Engineering & Design	$700	$77	11%	$777	0.0%	$700	$77	$777	2011Q3	1.5%	$711	$78	$789
0.0%	Engineering Tech Review ITR & VE	$0	$0	11%	$0	0.0%	$0	$0	$0	2011Q3	1.5%	$0	$0	$0
0.0%	Contracting & Reprographics	$0	$0	11%	$0	0.0%	$0	$0	$0	2011Q3	1.5%	$0	$0	$0
0.0%	Engineering During Construction	$200	$22	11%	$222	0.0%	$200	$22	$222	2013Q1	7.2%	$214	$24	$238
0.0%	Planning During Construction	$0	$0	11%	$0	0.0%	$0	$0	$0	2013Q1	7.2%	$0	$0	$0
0.0%	Project Operations	$0	$0	11%	$0	0.0%	$0	$0	$0	2011Q3	7.2%	$0	$0	$0
31	CONSTRUCTION MANAGEMENT					0.0%	$0	$0			0.0%	$0	$0	
0.0%	Construction Management	$600	$60	10%	$660	0.0%	$600	$60	$660	2013Q1	7.2%	$643	$64	$707
0.0%	Project Operation:	$0	$0	10%	$0	0.0%	$0	$0	$0	2013Q1	7.2%	$0	$0	$0
0.0%	Project Management	$0	$0	10%	$0	0.0%	$0	$0	$0	2013Q1	7.2%	$0	$0	$0
	CONTRACT COST TOTALS:	$15,254	$3,215		**$18,469**		$15,254	$3,215	$18,469			$15,643	$3,301	**$18,944**

Filename: FINAL Rice Lake TPCS 2 Jan GPM JGN Review.xlsx
TPCS

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LAGRANGE POOL, ILLINOIS WATERWAY
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FULTON COUNTY, ILLINOIS

APPENDIX K
LITERATURE CITED

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LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX L
REAL ESTATE PLAN

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM

RICE LAKE STATE FISH AND WILDLIFE AREA HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX L
REAL ESTATE PLAN

I. PURPOSE

This Real Estate Plan (REP) is developed in support of the Upper Mississippi River Environmental Management Program, Definite Project Report with Integrated Environmental Assessment for the Rice Lake State Fish and Wildlife Area Habitat Rehabilitation and Enhancement Project. The project is authorized under the Water Resources Development Act (WRDA) of 1986, (P.L. 99-662), as amended. The project area is located in Fulton County, Illinois, approximately twenty-four miles southwest of Peoria, Illinois. The Illinois Department of Natural Resources (IDNR) is the non-Federal sponsor (NFS) for this project.

The Rice Lake State Fish and Wildlife Area (SFWA) has been managed for migratory birds and other wetland dwelling species since the IDNR purchased tracts of land in the project area during the 1940s, 1950s, 1980s, and 2000s. Site management by the State includes operation of pump stations and water control structures to provide reliable food production for migrating birds. The opportunity exists to increase overall preferred habitat quality and quantity by attenuating summer and fall flooding impacts, and by increasing native floodplain grassland and forest cover.

The goals of the proposed project are to restore and protect wetland, aquatic, and floodplain habitats. The following objectives have been identified to meet these goals:

(1) increase success rate of annual emergent/moist-soil vegetation production;
(2) reduce adverse effects of river stage fluctuations on wetland habitat;
(3) increase fish egress opportunities from Rice Lake during drawdown periods;
(4) maintain seasonal access between Rice Lake/Big Lake aquatic areas and Illinois Waterway;
(5) increase off-main channel aquatic habitat in Illinois Waterway; and
(6) increase natural food and cover for resident and migratory wildlife.

II. DESCRIPTION OF THE LANDS, EASEMENTS, AND RIGHTS-OF-WAY (LER) REQUIRED FOR CONSTRUCTION, OPERATION, AND MAINTENANCE OF THE PROJECT

The Rice Lake SFWA is a 6,800 acre wildlife management area located on the right descending bank of the Illinois Waterway's LaGrange Pool, approximately four miles downstream of Banner, Illinois, between River Miles (RM) 132.0 and 138.0. The Rice Lake SFWA is managed by the IDNR to provide quality nesting and mid-migration habitat for migratory and resident waterfowl. The project area is comprised of several backwater lakes, wet floodplain forests, and floodplain agricultural fields. The agricultural fields are located on a large tract of floodplain (Duck Island) that separates the two largest lakes, Rice and Big Lake. Coordinates are Sections 21, 22, 23, 24, 25, 26, 27, 28, 32, 33, 34, 35 Township 6 North, Range 5 East & Sections 2, 3, 4, 5, 9 Township 5 North, Range 5 East (Fulton County, Illinois). The project area is shown as enclosure 1.

The recommended plan for habitat rehabilitation and enhancement of the Rice Lake SFWA includes a Perimeter Water Control Spillway (L2), Pump Station and Conveyance Facilities (P2), Fish Access (F2), and Duck Island Native Vegetation Plantings (T5).

Perimeter Water Control Spillway (L2). This feature consists of a spillway, approximately 24,050 ft long and a 60-inch (in) gatewell structure. These structures would be designed to provide protection from low level summer flooding 4 out of 10 years, which would allow for moist soil plant production to benefit resident and migratory waterfowl.

The proposed perimeter water control spillway would be aligned to take full advantage of natural ground elevations on the east side of Big and Goose lakes and existing remnants of the Hate Levee to the south, which would minimize ground disturbance and reduce construction costs (see project map). The spillway would be constructed to elevation 440 ft NGVD using adjacent clay material and clay material dredged from Goose Pond (totaling 22,000 cubic yards). The spillway slopes would be a minimum three horizontal ft (run) on one vertical ft (rise) (3:1) in areas of dry construction and 4:1 where material dredged from Goose Lake is used.

The spillway would be constructed to approximately a five-year level of protection. Riprap (approximately 25,000 tons) would be placed on both side slopes and the crown.

A new gatewell structure would be installed adjacent to the two existing gatewell structures. The 60-in gatewell would consist of reinforced concrete piping (RCP) and an interior sluice gate (see Plate 15).

Pump Station and Conveyance Facilities (P2). A new 133,200 gpm pump station and conveyance system would be constructed to allow for water management of Rice Lake, Big Lake, Goose Lake, and the Voorhees Unit.

Four 33,300 gpm or three 44,400 gpm pumps would be installed as shown on plates 25 and 26. Four smaller pumps were prefered over larger pumps because of their reduced power requirements, greater management flexibility, and reduced operating expenses. The pump station building would be a weather-tight, vandal-resistant concrete structure. The intakes to the pump station would have steel trash racks and bulkheads to protect the pump from debris and sedimentation.

Seven thousand feet of clearing, grubbing, and channel excavation would be completed to convey the water between the pump station and the project's lakes. The channel would be between an existing road embankment (on the southern side) and a newly constructed berm on the opposite side. The berm would be constructed from the channel excavation material with a top elevation of 440 ft NGVD, side slopes of 3:1, and a top width of 10 ft (minimum). The channel would have a bottom elevation of 430 ft NGVD and side slopes of 3:1. There would be a 10 ft buffer between the top bank of the channel and the toe of both the existing levee and the new berm.

Water control structures would be constructed along the new discharge channel. Two (2) 24-in CMP stoplog structures and three (3) 48-in CMP stoplog structures would be installed to provide water to the Voorhees Unit and Big Lake, respectively. Three (3) more 48-in CMP structures would be installed to connect the new discharge channel to the existing channel that leads to Rice Lake. In order to maintain connectivity between the upper and lower portions of Slim Lake, two water control structures (one going from the new discharge channel into the upper Slim Lake and the other to the lower portion of Slim Lake) will be installed. These two structures will be prefabricated Agridrain ® or similar type structures.

Fish Access (F2). Two reinforced concrete fish egress structures will be constructed as shown on Plates 16 and 17. These structures will be designed to provide passage of fish from Rice Lake and Goose Lake to the quarry and Illinois Waterway, respectively, during drawdown periods.

These fish egress structures will be 9 ft wide inside reinforced concrete structures able to support vehicular traffic. A stoplog structure will be included on the Rice Lake side and the Illinois Waterway side of the two structures. Both stoplog structures will have two bays to minimize length of stoplogs thus minimizing efforts for installation and removal of stoplogs. The invert elevations of both structures will be 430 ft NGVD. Structures will be constructed and designed such that the substrate of the fish egress is consistent with the surrounding substrate.

Duck Island Native Vegetation Plantings (T5). Approximately 409 acres will be planted in mast-producing trees and native grasses. The site of the planting will be the agricultural areas on Duck Island.

Mast-producing tree plantings will occur on approximately 352 acres of the site. Pin oak, swamp white oak, bur oak, northern pecan, hackberry, black cherry, shingle oak, Kentucky coffee tree, persimmon, red oak, shellbark hickory, and black walnut will be planted in approximate 100 acre increments over a 4-year period. Species will be intermixed to avoid solid blocks of individual species (monoculture).

Per recommendation of the IDNR, bare root seedlings approximately 12 to 24 inches in height will be planted. Trees will be planted on a 10' by 10' maximum spacing (=435 trees/acre). Species will be planted according to suitable site location on Duck Island (based on soils maps) and well mixed within planting rows. Following a three-year establishment period, the surrounding ground in all mast-tree planting areas will be allowed to assume natural growth.

Establishing the approximately 57 acres of grasslands on Duck Island will require tilling and seeding the area with a native grass mixture. Native grass and forbs species will be selected based on their historical range, their affinity for open, somewhat sandy conditions, and their ability to withstand some flooding. Candidate grass species include, but may not be limited to, big bluestem (*Andropogon*

gerardii), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), side oats grama (*Bouteloua curtipendula*), and perennial rye grass (*Lolium perenne*). Some areas will require clearing of recent growth. Weed control will be required until the preferred vegetation becomes well established. This can be accomplished through a combination of herbicides, mowing, and seasonal burning as appropriate.

Seeding will begin in the spring no earlier than March 15th and will be completed no later than May 5th. If planted in the fall, starting and ending dates will be October 1st and November 15th, respectively. Species will be intermixed to avoid solid blocks of individual species (monoculture).

The total value of lands for this project is estimated at $7,454,000. The number of owners, acres and type of estates required are as follows:

Number of Tracts	Number of Owners	Acres	Type of Estate
1	1	4,070	Fee
1	1	8.02	Temporary Access Easement

III. SPONSOR-OWNED LANDS

The Illinois Department of Natural Resources (IDNR) presently owns and manages the existing site.

IV. NON-STANDARD ESTATES

No non-standard estate is required for this project.

V. EXISTING FEDERAL PROJECT WITHIN THE LER REQUIRED FOR THE PROJECT

A portion of the Rice Lake SFWA was purchased using Federal funds through the Federal Aid in Wildlife Restoration Program. This portion of Rice Lake does not fall within the proposed project boundary. The lands proposed for the Rice Lake Habitat Rehabilitation and Enhancement Project currently do not entail previous Federal involvement.

VI. EXISTING FEDERALLY-OWNED LAND

There is no federally-owned land required for the project.

VII. NAVIGATIONAL SERVITUDE

It was determined that the Government has no authority to acquire real estate needed for this project via navigation servitude. The ecosystem restoration measures of the Project do not address environmental impacts associated with navigation measures. Further, the proposed environmental restoration Project features do not impact navigation.

VIII. MAP DEPICTING THE AREA

The real estate Project Area Map is attached as enclosure 1.

IX. INDUCED FLOODING

There will be no induced flooding on adjacent private lands as a result of this project.

X. BASELINE COST ESTIMATE

	NON-FEDERAL	FEDERAL
Lands and Damages	$6,482,000	$0
Relocation Costs	$1,000	$0
Incidental Acquisition Costs a. NFS Acquisition Costs b. Incremental Costs	 $10,000 $972,000	 $5,000 $
Total Project Acquisition Value -	$7,465,000	$5,000

XI. PUBLIC LAW (PL) 91-646 RESIDENCE/BUSINESS RELOCATION ASSISTANCE BENEFITS

The project does not require any relocation of persons, farms, or businesses; therefore, there are no anticipated Public Law 91-646 Relocation Assistance Benefit payments.

XII. MINERAL ACTIVITY IN THE PROJECT AREA

No significant impacts to mineral resources are expected to occur as a result of this project. The remaining supply of aggregate material is variously estimated from approximately 6,400 tons per acre to 9,000 tons per acre with approximately 375 acres estimated suitable for potential mining. The mining activity on Duck Island has been seasonal and is subject to closure during high water. The minerals extracted are of average quality and when processed correctly meet the Illinois Department of Transportation standards. The mine operator's lease was extended through 2010 with an option for renewal. The native herbaceous and mast tree planting feature could potentially affect future mining activity at the Duck Island quarry if the ILDNR does not continue the commercial lease beyond 2011.

There are four individual parcels that have been excluded from inside the project area as to not affect any current or potential mining/excavating operations. They are identified under the quarry lease area on the project area map and attached as enclosure 1. Collectively the four parcels total 131 acres of

land that is excluded from the project and will not receive any LERRD credit. However, there is an agreement to share the access road with the mining operators which is also not included as part of the LERRD crediting.

XIII. NON-FEDERAL SPONSOR'S LEGAL AND PROFESSIONAL ACQUISITION CAPABILITY TO ACQUIRE LER

The Sponsor Acquisition Capability Checklist is included as enclosure 2. The sponsor has been advised of P.L. 91-646 requirements concerning acquisition and relocation,

XIV. ZONING ORDINANCES

No known zoning ordnances are proposed.

XV. SCHEDULE OF LAND ACQUISITION

As stated in paragraph III, the proposed NFS currently owns and manages the project area therefore there are no anticipated lands to be acquired.

XVI. FACILITY/UTILITY RELOCATIONS

There are no facility or utility relocations associated with this project.

XVII. IMPACTS OF SUSPECTED OR KNOWN CONTAMINANTS

There is no known or suspected presence of contamination located in, on, under, or adjacent to the LER required for the construction, operation, or maintenance of the project. A hazardous, toxic, and radioactive waste (HTRW) site assessment was conducted. The project is located in an area that primarily is and historically has been agricultural, quarry, and outdoor recreational land. There is little evidence that the land has been used for other purposes. There were no obvious indications of potential contamination sources or migration pathways from surrounding properties. It does not appear that there is a risk of hazardous, toxic, or radioactive waste contamination within the project area.

XVIII. LANDOWNERS SUPPORT OR OPPOSITION TO THE PROJECT

The NFS is the landowner of the project area and is very much in favor of the project. At this time, the support or opposition of adjoining or nearby landowners is unknown. Adjoining and nearby landowner concerns are not anticipated.

XIX. RISKS OF ACQUIRING LANDS BEFORE EXECUTION OF THE PPA

There currently are no lands for the sponsor to acquire since they already own Fee Title to the lands proposed for the project. The NFS would be apprised of appraisal requirements for lands that are already considered "sponsor owned". In the event that the NFS would need to acquire additional lands, and if deemed necessary, a risk letter would be provided to the NFS that explains the risks associated with acquisition activities prior to execution of a PPA.

XX. OTHER REAL ESTATE ISSUES RELEVANT TO THE PROJECT

There are no other known real estate issues at this time.

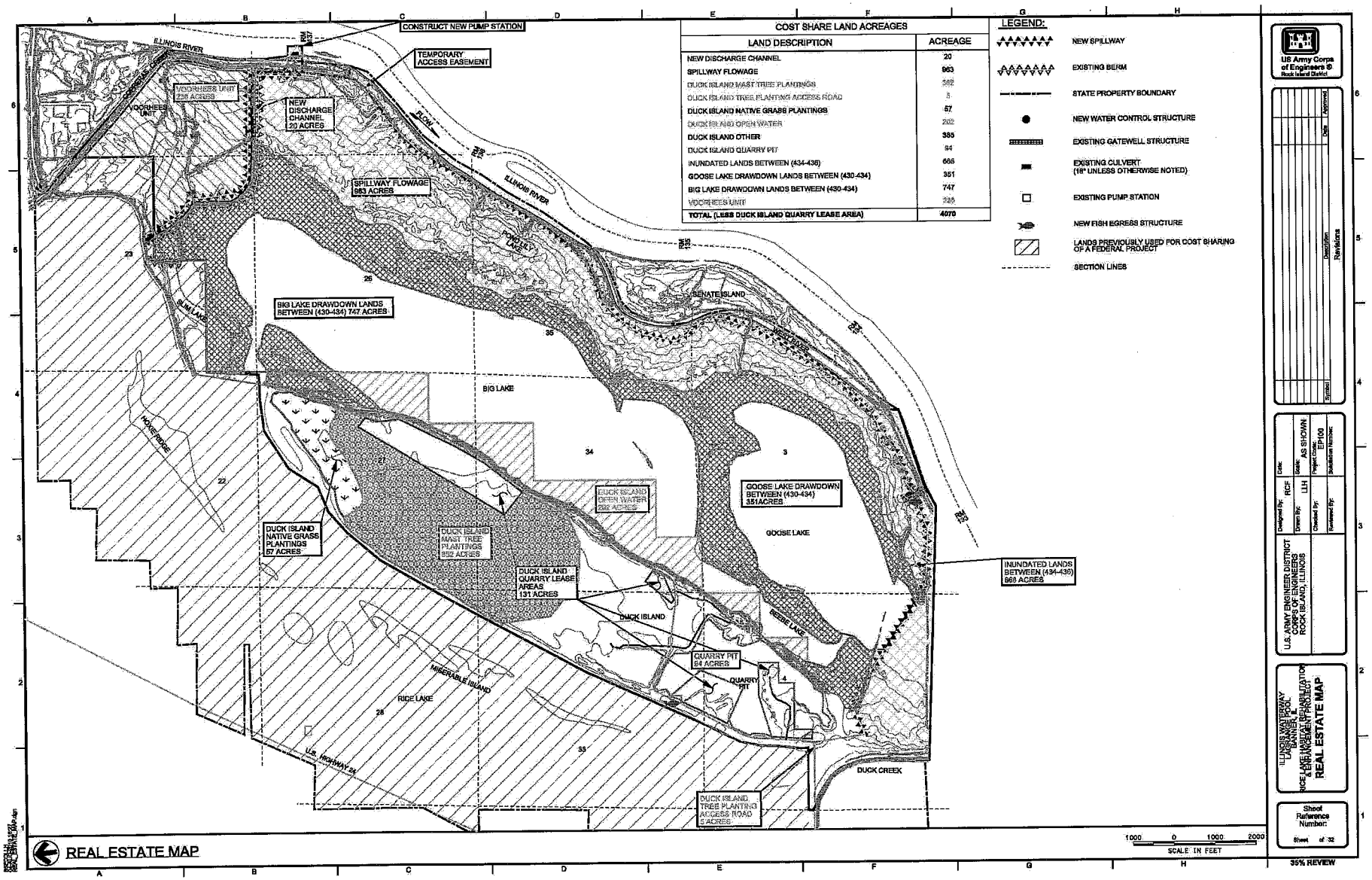
Dated: 9/30/2010

Signed: _____
Ron Williams
Chief, Partnership Programs & Support Branch
Real Estate Division

Dated: 10/12/2010

Concurred: _____
Stuart P. Jackson
Chief, Real Estate Division
U.S. Army Corps of Engineers
Rock Island District

ENCLOSURE 1
PROJECT AREA MAP



COST SHARE LAND ACREAGES	
LAND DESCRIPTION	ACREAGE
NEW DISCHARGE CHANNEL	20
SPILLWAY FLOWAGE	963
DUCK ISLAND MAST TREE PLANTINGS	352
DUCK ISLAND TREE PLANTING ACCESS ROAD	5
DUCK ISLAND NATIVE GRASS PLANTINGS	57
DUCK ISLAND OPEN WATER	202
DUCK ISLAND OTHER	385
DUCK ISLAND QUARRY PIT	84
INUNDATED LANDS BETWEEN (434-436)	666
GOOSE LAKE DRAWDOWN LANDS BETWEEN (430-434)	351
BIG LAKE DRAWDOWN LANDS BETWEEN (430-434)	747
VOORHEES UNIT	238
TOTAL (LESS DUCK ISLAND QUARRY LEASE AREA)	4070

LEGEND:
- NEW SPILLWAY
- EXISTING BERM
- STATE PROPERTY BOUNDARY
- NEW WATER CONTROL STRUCTURE
- EXISTING GATEWELL STRUCTURE
- EXISTING CULVERT (18" UNLESS OTHERWISE NOTED)
- EXISTING PUMP STATION
- NEW FISH EGRESS STRUCTURE
- LANDS PREVIOUSLY USED FOR COST SHARING OF A FEDERAL PROJECT
- SECTION LINES

US Army Corps of Engineers ® Rock Island District

Revisions: Symbol | Description | Date | Approved

Designed By: RCP | Drawn By: LLH | Checked By: | Reviewed By:
Date:
Scale: AS SHOWN
Project Code: EP100
Submittal Number:

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY LAKE MANAGEMENT PLAN BANNER, IL

RICE LAKE HABITAT REHABILITATION AND ENHANCEMENT PROJECT

REAL ESTATE MAP

Sheet Reference Number: Sheet of 32

35% REVIEW

L-8

ENCLOSURE 2

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY

I. Legal Authority

A. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? **Yes**

B. Does the sponsor have the power of eminent domain for this project? **Yes, the state does have eminent domain authority, however it requires governor signoff and at this point in time politically that would not be an option or necessary since the IDNR already owns the property that is the object of the project.**

C. Does sponsor have "quick take" authority for this project? **No**

D. Are any of the land/interests in land required for the project located outside the sponsor's political boundary? **No**

E. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn? **N/A**

II. Human Resource Requirements

A. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including P.L. 91-646, as amended? **No**

B. If the answer to II.A is "yes", has a reasonable plan been developed to provide such training?

C. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? **Yes**

D. Is the sponsor's projected in-house staffing level sufficient considering its other work load, if any, and the project schedule? **Yes**

E. Can the sponsor obtain contractor support, if required in a timely fashion? **Yes**

F. Will the sponsor likely request USACE assistance in acquiring real estate? (If "yes", provide description). **No**

ENCLOSURE 2
ASSESSMENT OF NON-FEDERAL SPONSOR'S
REAL ESTATE ACQUISITION CAPABILITY

III. Other Project Variables

A. Will the sponsor's staff be located within reasonable proximity to the project site? **Yes**

B. Has the sponsor approved the project/real estate schedule/milestones? **Yes**

IV. Overall Assessment

A. Has the sponsor performed satisfactory on other USACE projects? **Yes**

B. With regard to this project, the sponsor is anticipated to be: **Capable**

V. Coordination

A. Has this assessment been coordinated with the sponsor? **Yes**

Does the sponsor concur with this assessment? **Yes** (If "no", provide explanation).

Prepared by:

Jason C. Appel
Realty Specialist
Real Estate Division
Rock Island District

Reviewed and approved by:

Stuart P. Jackson
Chief, Real Estate Division
U.S. Army Corps of Engineers
Rock Island District

Quality Control Plan Checklist

Real Estate Plans

And other similar Feasibility-Level Real Estate Planning Documents

ER 405-1-12, Section 12-16, Real Estate Handbook, 1 May 1998

A Real Estate Plan (REP) is prepared in support of a decision document for full-Federal or cost shared specifically authorized or continuing authority projects. It identifies and describes lands, easements and rights-of-way (LER) required for the construction, operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of a proposed project including requirements for mitigation, relocations, borrow material, and dredged or excavated material disposal. It also identifies and describes facility/utility relocations, LER value, and the acquisition process. The REP does not just cover LER to be acquired by the non-Federal sponsor (NFS) or Government. The report covers all LER needed for the project, including LER already owned by the NFS, Federal Government, other public entities, or subject to the navigation servitude.

The REP must contain a detailed discussion of the following 20 topics, as set out in Section 12-16 of the ER, including sufficient description of the rationale supporting each conclusion presented. If a topic is not applicable to the project, this should be stated in the REP. The pages of a REP should be numbered.

PROJECT - EMP Rice Lake Habitat Rehabilitation and Enhancement Project

REPORT TITLE – Rice Lake Real Estate Plan

Date of Report – September 2010 **Date of REP** – September 2010

1. **Purpose of the REP**. _X_
   a. Describe the purpose of the REP in relation to the project document that it supports.
   b. Describe the project for the Real Estate reviewer.
   c. Describe any previous REPs for the project.

2. **Describe LER**. _X_
   a. Account for all lands, easements, and rights-of-way underlying and required for the construction, OMRR&R of the project, including mitigation, relocations, borrow material and dredged or excavated material disposal, whether or not it will need to be acquired or will be credited to the NFS.
   b. Provide description of total LER required for each project purpose and feature.
   c. Include LER already owned by the Government, the NFS and within the navigation servitude.
   d. Show acreage, estates, number of tracts and ownerships, and estimated value.
   e. Break down total acreage into fee and the various types and durations of easements.
   f. Break down acreage by Government, NFS, other public entity, and private ownership, and lands within the navigation servitude.

3. **NFS-Owned LER.** _X_

a. Describe NFS-owned acreage and interest and whether or not it is sufficient and available for project requirements.

b. Discuss any crediting issues and describe NFS views on such issues.

4. Include any proposed **Non-Standard Estates.** _X_

a. Use Standard Estates where possible.

b. Non-standard estates must be approved by HQ to assure they meet DOJ standards for use in condemnations.

c. Provide justification for use of the proposed non-standard estates.

d. Request approval of the non-standard estates as part of document approval.

e. If the document is to be approved at MSC level, the District must seek approval of the non-standard estate by separate request to HQ. This should be stated in the REP.

f. Exception to HQ approval is District Chiefs of RE approval of non-standard estate if it serves intended project purposed, substantially conforms with and does not materially deviate from the standard estates found in the RE Handbook, and does not increase cost or potential liability to the Government. A copy of this approval should be included in the REP. (See Section 12-10c. of RE 405-1-12)

g. Although estates are discussed generally in topic 2, it is a good idea to also state in this section which standard estates are to be acquired and attach a copy as an appendix. The duration of any temporary estates should be stated.

5. **Existing Federal Projects.** _X_

a. Discuss whether there is any existing Federal project that lies fully of partially within LER required for the project.

b. Describe the existing project, all previously-provided interests that are to be included in the current project, and identify the sponsor.

c. Interest in land provided as an item of local cooperation for a previous Federal project is not eligible for credit.

d. Additional interest in the same land is eligible for credit.

6. **Federally-Owned Lands** _X_

a. Discuss whether there is any Federally owned land included within the LER required for the project.

b. Describe the acreage and interest owned by the Government.

c. Provide description of the views of the local agency representatives toward use of the land for the project and issues raised by the requirement for this land.

7. **Navigation Servitude.** _X_

a. Identify LER required for the project that lies below the Ordinary High Water Mark, or Mean High Water Mark, as the case may be, of a navigable watercourse.

b. Discuss whether navigation servitude is available

c. Will it be exercised for project purposes? Discuss why or why not.

d. Lands over which the navigation servitude is exercised are not to be acquired nor eligible for credit for a Federal navigation or flood control project or other project to which a navigation nexus can be shown.

e. See paragraph 12-7 of ER 405-1-12.

8. **Map** _X_

a. An aid to understanding

b. Clearly depicting project area and tracts required, including existing LER, LER to be acquired, and lands within the navigation servitude.

c. Depicts significant utilities and facilities to be relocated, any known or potential HTRW lands.

9. **Induced Flooding** can create a requirement for real estate acquisition. _X_

a. Discuss whether there will be flooding induced by the construction and OMRR&R of the project.

b. If reasonably anticipated, describe nature, extent and whether additional acquisition of LER must or should occur.

c. Physical Takings Analysis (separate from the REP) must be done if significant induced flooding anticipated considering depth, frequency, duration, and extent of induced flooding.

d. Summarize findings of Takings Analysis in REP. Does it rise to the level of a taking for which just compensation is owed?

10. **Baseline Cost Estimate** as described in paragraph 12-18. _X_

a. Provides information for the project cost estimates.

b. Gross Appraisal includes the fair market value of all lands required for project construction and OMRR&R.

c. PL 91-646 costs

d. Incidental acquisition costs

e. Incremental real estate costs discussed/supported.

f. Is Gross Appraisal current? Does Gross Appraisal need to be updated due to changes in project LER requirements or time since report was prepared?

11. **Relocation Assistance Benefits** Anticipated. _X_

a. Number of persons, farms, and businesses to be displaced and estimated cost of moving and reestablishment.

b. Availability of replacement housing for owners/tenants

c. Need for Last Resort Housing benefits

d. Real Estate closing costs

e. See current 49 CFR Part 24

12. **Mineral Activity**. _X_

a. Description of present or anticipated mineral activity in vicinity that may affect construction, OMRR&R of project.

b. Recommendation, including rationale, regarding acquisition of mineral rights or interest, including oil or gas.

c. Discuss other surface or subsurface interests/timber harvesting activity

d. Discuss effect of outstanding 3rd party mineral interests.

e. Does estate properly address mineral rights in relation to the project?

13. **NFS Assessment** _X__

a. Assessment of legal and professional capability and experience to acquire and provide LER for construction, OMRR&R of the Project.

b. Condemnation authority

c. Quick-take capability

d. NFS advised of URA requirements

e. NFS advised of requirements for documenting expenses for credit.

f. If proposed that Government will acquire project LER on behalf of NFS, fully explain the reasons for the Government performing work.

g. A copy of the signed and dated Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability (Appendix 12-E) is attached to the REP.

14. **Zoning** in Lieu of Acquisition _X__

a. Discuss type and intended purpose

b. Determine whether the proposed zoning proposal would amount to a taking for which compensation will be due.

15. **Schedule** _X__

a. Reasonable and detailed Schedule of land acquisition milestones, including LER certification.

b. Dates mutually agreed upon by Real Estate, PM, and NFS.

16. **Facility or Utility Relocations** _X__

a. Describe the relocations, identity of owners, purpose of facilities/utilities, whether owners have compensable real property interest.

b. A synopsis of the findings of the Preliminary Attorney's Investigation and Report of Compensable Interest is included in the REP as well as statements required by Sections 12-17c.(5) and (6).

c. Erroneous determinations can affect the accuracy of the project cost estimate and can confuse Congressional authorization.

d. Eligibility for substitute facility

1. Project impact
2. Compensable interest
3. Public utility or facility
4. Duty to replace
5. Fair market value too difficult to determine or its application would result in an injustice to the landowner or the public.

e. See Sections 12-8, 12-17, and 12-22 of ER 405-1-12.

17. **HTRW** and Other Environmental Considerations _X___

a. Discussion the impacts on the Real Estate acquisition process and LER value estimate due to known or suspected presence of contaminants.

b. Status of District's investigation of contaminants.

c. Are contaminants regulated under CERCLA, other statues, or State law?
d. Is clean-up or other response required of non-CERCLA regulated material?
e. If cost share, who is responsible for performing and paying cost of work?
f. Status of NEPA and NHPA compliances
g. See ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects.

18. **Landowner Attitude**. X
a. Is there support, apathy, or opposition toward the project?
b. Discuss any landowner concerns on issues such as condemnation, willing seller provisions, estates, acreages, etc.?

19. A statement that the **NFS has been notified in writing about the risks of acquiring LER before the execution of the PPA**. If not applicable, so state. _____

20. **Other Relevant Real Estate Issues**. Anything material to the understanding of the RE aspects of the project. X

A copy of the completed Checklist is attached to the REP. X
(Draft REPs must contain a draft checklist and draft Technical Review Guide)

I have prepared and thoroughly reviewed the REP and all information, as required by Section 12-16 of ER 405-1-12, is contained in the Plan.

Preparer — Date: 30 SEP 2010

A copy of the Real Estate Internal Technical Review Guide for Civil Works Decision Documents is attached and signed by me as the Reviewer

RE Internal Technical Reviewer — Date: 9/30/2010

The REP has been signed and dated by the Preparer and the District Chief of Real Estate.

_____

REAL ESTATE INTERNAL TECHNICAL REVIEW GUIDE FOR CIVIL WORKS DECISION DOCUMENTS

Real Estate Guide for Review of Civil Works Decision Documents

1. Initially, read the entire Real Estate Plan (REP). After reading the REP:

   a. Do you have a good idea of the scope of the project?

   b. Did you note any omissions?

   c. What questions do you have regarding the project?

   d. Were all the elements of an REP as listed in Chapter 12 covered?

   e. Do you have a completed Quality Control Plan for the REP?

2. Next, read the main body of the decision document (including the chapter on the recommended plan), paying particular attention to the overall scope of the project, proposed facility relocations, environmental investigations, mitigation requirements, navigational servitude, and possibility of induced flooding.

3. Then, read the REP again, noting any discrepancies between the REP and the main report. Pay particular attention not only to what the report says, but also to what the report does not say. Many review comments are due to items being omitted or not discussed in enough detail in the REP.

4. Finally, ask yourself specific questions about the project such as the following. You should be able to answer them by reading the REP.

   a. What is the project's purpose and have there been prior real estate planning documents for this project?

   b. Is the purpose of the report to gain Congressional authorization (e.g., a Feasibility Report)? If not, what is the real estate acquisition authority for the project and is the proper authority cited in the report?

   c. Who is the sponsor that will execute the PPA? Has an assessment of the sponsor's capability been completed and included in the report? Does the sponsor have eminent domain and quick take authority? If not, does the report address how acquisition will be accomplished if condemnation is required? Does the sponsor currently own any lands required for the project? If so, were any of these lands obtained as part of another Federal project or funded with Federal funds in whole or in part?

d. Are there any lands currently owned by the Federal government involved in this project? If so, has it been coordinated with the

e. Does the project involve a navigable waterway and could the navigational servitude be utilized for purposes of the project? If the project is not a navigation project and asserting navigational servitude is proposed, does the report state the legal basis for asserting navigational servitude?

f. Is there a possibility of induced flooding, and has a taking analysis been completed? What was the outcome of that analysis? Are flowage easements required because the anticipated flooding will rise to the level of a taking?

g. Are the interests and estates sufficient to provide for construction, operation, maintenance, repair, replacement and rehabilitation (OMRR&R) of the project? Do the estates not only grant the interest needed for construction and maintenance, but do they prohibit practices that might interfere with the project in the future? Is the term for any temporary easements defined and are they for an appropriate duration?

h. How do we physically access the project site? Is an additional real estate interest required for construction access and/or OMRR&R access?

i. Is there a need to dispose of borrow material? If so, are these areas included in the report as LERRD items or, if proven cost efficient, contractor provided items? Are the environmental issues associated with borrow/disposal effectively addressed?

j. Will a contractor's staging area be required?

k. Are any persons being displaced from their homes as a result of the project? If so, how many? Is replacement housing available? Will standard PL 91-646 benefits be provided? Will any businesses require relocation assistance? Has a replacement housing survey been accomplished?

l. Are there any public facilities to be altered or relocated? Do the below relocations meet all of the following five tests?

(1) The project design requires the facility to be moved in whole or in part (temporarily or permanently), or the project will negatively impact the ongoing function or operation of the facility.

(2) The owner of the facility has a compensable real property interest in the land on which the impacted portion of the facility is located.

(3) The facility serves a public purpose.

(4) The owner of the facility has a duty to replace the facility as a result of legal or factual necessity (continuing need).

(5) The fair market value of the interest that must be acquired due to project impact is too difficult to ascertain, or payment of fair market value instead of providing a substitute facility would result in manifest injustice to the owner or the public. Have preliminary opinions of compensability be completed for each facility? If the REP is part of a decision document that will serve as the basis for Congressional authorization, does it contain the disclaimer language required by ER 405-1-12, para. 12-17c(6)?

m. Are any cemeteries in the project area? If so, how will they be impacted? If they are allowed to remain in place, how will permanent access be provided? If they are to be relocated, the report should address the preparation of a cemetery relocation plan.

n. Does the report address the types of ownership, number of tracts and acres, and estates to be acquired? Does the report address mineral activity and whether the minerals will be acquired, subordinated, or left outstanding?

o. Does the report state if any nonstandard interest or estate will be utilized? If so, is a copy of the estate in the report?

p. Do the acres, values, and estates contained in the baseline cost estimate agree with those contained in an approved gross appraisal for the project? If not, any discrepancy should be discussed with the Appraisal Branch and reconciled. Does the acreage and cost presented in the REP agree with real estate acreage and costs shown elsewhere in the main report or MCACES estimate? Does the cost estimate show the estimated cost by estate, contingency, administrative cost, and relocation assistance? The cost should be shown for both Federal and non-Federal, where appropriate.

q. Does the report address the status of all environmental considerations and approvals, HTRW assessments, NEPA compliance, and NHPA compliance? If any land required for the project is contaminated, is it CERCLA or non-CERCLA regulated material?

r. Does the report contain a reasonable schedule for acquisition, and has the schedule been coordinated with the sponsor? Is the project to be accomplished in more than one phase?

s. Does the report contain a map depicting all of the tracts and estates to be acquired? Does it show any known or potential HTRW lands?

t. Obviously, all of the above items will not apply to every project; however, if the REP fails to address an item, the reviewer does not know if it is considered. If the individual preparing the document is aware that an item is not applicable, but fails to include that information in the REP, the report should contain a statement that this item is not applicable.

u. The Reviewer should verify that the real estate requirements shown in the REP are in consort with the latest design drawings.

v. The Reviewer should consult with the other team members and Real Estate employees, as necessary, to resolve questions or misunderstandings prior to preparing comments to the Report Preparer.

I have reviewed the Rice Lake Real Estate Plan

and have considered all of the above.

Real Estate Internal Technical Reviewer

9/30/2010
Date

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX M
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

CEMVR-EC-DN

January 8, 2010
S. Gustafson

MEMORANDUM FOR RECORD

SUBJECT: Hazardous, Toxic, and Radiological Waste (HTRW) Assessment Update for the Rice Lake Habitat Rehabilitation and Enhancement Project (HREP), La Grange Pool, Illinois Waterway River Miles 132 to 138.

1. Summary. An Environmental Site Assessment (ESA) Transaction Screening Process was completed on January 7 and 8, 2010 for Rice Lake HREP in general conformance with ASTM Practices E 1527-00, E 1527-05 and E 1528-00, ER 1165-2-132, and MVD DIVR 1165-2-9. The inquiry consisted of a review of the November 2002 HTRW Documentation Report for the same project location, an interview with Bill Douglass of the Illinois Department of Natural Resources (DNR), and review of state and federal records. This assessment revealed no evidence of hazardous substances, HTRW, or other regulated contaminants in connection with the project area.

2. Location. The 6,800-acre Rice Lake HREP lies on the right descending bank of the Illinois Waterway between River Miles (RM) 132.0 and 138.0, near Banner, Illinois. The project is located on the east side of U.S. Highway 24 in Fulton County, Illinois, approximately 24 miles southwest of Peoria, Illinois. The Rice Lake project area is located adjacent to, and immediately downstream from, the Banner Marsh SFWA, which is also a HREP. The Rice Lake project area encompasses the land and water areas that comprise the Rice Lake SFWA (5,600 acres) and Duck Island peninsula (1,200 acres).

3. Records Review. An environmental review of the area within ½ mile of the proposed project area was conducted on January 7, 2010. The U.S. EPA Enviromapper Database, the National Response Center Database, Illinois EPA Site Remediation Program Database, Illinois EPA Leaking Underground Storage Tank (LUST) Database, Illinois DNR Coal Mine Database, and US EPA Cleanups In My Community Database. One LUST site was noted along the western edge of Rice Lake. Coal surface mining has taken place north and west of the project area. Aggregate surface mining is taking place on the southern end and northeastern corner of Duck Island.

4. Current and Historical Use. The project area is currently part of the Rice Lake State Fish and Wildlife Area owned and operated by the Illinois DNR. The area is used for recreation for the general public. To the south of the project area is an aggregate mining facility (southern end of Duck Island). The north end of Duck Island is used for agricultural crop production. To the north is a historical coal mining area. The project area is bounded to the east by the Illinois River. The project area has been used for recreation and agriculture since 1900.

5. Interviews. Bill Douglass of the Illinois DNR (Rice Lake Fish and Wildlife Area manager) was interviewed on January 8, 2010. Mr. Douglass stated that to the best of his knowledge, no spills or dumping of hazardous substances occurred in the subject work area. A LUST site was present at the Rice Lake offices, but this is outside of the subject work area.

6. Site Reconnaissance. The interview with DNR personnel and a review of past project reports and photographs indicated no visual indications of recognized environmental conditions.

7. Conclusions and Recommendations. While there may be *de minimus* recognized environmental conditions on target properties due to trace amounts of fertilizers, pesticides, and herbicides because of agricultural activities upstream of the project area, there are no physical signs, records, or specialized knowledge indicating a significant recognized environmental condition concern for the project.

The LUST site is a significant distance from the project area, and the aggregate mining operations do not appear to be a significant source of HTRW concerns and are located outside of the project work area. It is recommended that no further HTRW assessments be conducted for this project.

8. The assessment was investigated and documented by Steve Gustafson, P.G., Environmental Engineering Section, Engineering and Construction Division.

Heather Anderson, P.E.
Chief, Environmental Engineering
Section

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE
PHASE I ESA DOCUMENTATION REPORT

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILATATION & ENHANCEMENT PROJECT
ILLINOIS WATERWAY
RM 132.0 THROUGH 138.0 LAGRANGE POOL

MARCH 2010

Prepared By:

Steve Gustafson P.G.
USACE
CEMVR-EC-DN
Rock Island District

Reviewed by:
Kara Mitvalsky P.E.

Executive Summary

1. **Background.** This report documents the Phase I Hazardous, Toxic, and Radioactive Waste (HTRW) Environmental Site Assessment (ESA) that was performed in general conformance with the scope and limitations of ASTM Practices E 1527-05 and E 1528-06, Engineering Regulation (ER) 1165-2-132 and ER 405-1-12 for the Habitat Rehabilitation and Enhancement Project (HREP) at Rice Lake State Fish and Wildlife Area, Illinois Waterway, RM 132.0-138.0, LaGrange Pool.

   The HREP calls for the construction of four enhancement features in the Rice Lake State Fish and Wildlife Area that will restore and protect the wetland habitat.

2. **Conclusions.** This assessment of maps, databases, interviews, land records, and a site reconnaissance did not identify any recognized environmental conditions in the project area or adjacent land properties.

3. **Recommendations.** This Phase I ESA has revealed that there is no evidence of recognized environmental conditions in connection with Rice Lake Habitat Rehabilitation and Enhancement Project (Project).

   It is recommended that no further HTRW assessment is needed. However, if any evidence of recognized environmental conditions is discovered during construction activities, operations should cease until Environmental Engineering Section, Design Branch, Engineering Division of the Rock Island District (MVR-EC-DN) is able to reassess the project area. Also if any coal-bearing rock are exposed and reacts with air and water during the excavating of the borrow material from south of Goose Lake, construction workers should cease work and notify the MVR-EC-DN of the acidic drainage

4. **Limitations.** No ESA can wholly eliminate uncertainty regarding the existence for recognized environmental conditions concerning a property. This assessment is intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with a property with reasonable limits of time and cost. Continuing the Environmental Due Diligence Audit process beyond this Phase I ESA would not reduce uncertainty, nor reveal any unidentified environmental liabilities. If any previously un-addressed recognized environmental condition should arise, this Phase I ESA will be revisited.

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TABLE OF APPENDICIES

1. Introduction.

1.1. Purpose and Scope. This HTRW inquiry is required in order to minimize and prevent Federal liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and to reduce any threats to project workers and avoid costly delays associated with environmental abatement activities. Appendix A contains a list of acronyms used in this report.

Phase I Environmental Site Assessments use only practically reviewable information. This investigation and assessment of the property is guided by the level appropriate for the type of property, information developed in the course of the assessment, project requirements, regulatory agency requirements, and potential risks. The screening methods used to prepare the Phase I ESA have been selected based on the location, physical setting, surrounding land uses, and particular nature of the habitat restoration site. Intrusive field sampling and lab analyses are not used for the Phase I ESA, but are reserved for the Phase II ESA when required.

This report documents the initial reconnaissance liability assessment for the Rice Lake State Fish and Wildlife Area Habitat Rehabilitation and Enhancement Project (Project). The goals of this Project are to enhance wetland, aquatic, and terrestrial habitats. Presently the Rice Lake State Fish and Wildlife Area (SFWA) has been managed for migratory birds and other wetland dwellings species. This site includes operations of a pump station and water control structures to provide reliable food production for migrating birds.

1.2. Authority. The U.S. Army Corps of Engineers, Rock Island District (Corps) is authorized by the 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662) to ensure the coordinated development and enhancement of the Illinois Waterway. This effort includes a Habitat Rehabilitation and Enhancement Project (HREP) for the planning, construction, and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement, implementation of a long-term resource monitoring program, implementation of a computerized inventory and analysis system, implementation of a program of recreational projects, assessment of the economic benefits generated by recreational activities in the system, and monitoring of traffic movement on the system.

1.3. Guidance and Policy. The Corps' Engineering Regulation (ER) providing guidance for the conduct of Civil Works Planning Studies is contained in ER 1105-2-100. The policies and authorities outlined in ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects, and ER 405-1-12, Real Estate Handbook, were developed to facilitate the early identification and appropriate consideration of HTRW issues in all of the various phases of a water resources study or project. American Society for Testing and Materials (ASTM) Standards E1527-05 and E1528-06 provide a comprehensive guide for conducting Phase I Environmental Site Assessments (ESA). These references provide information on what considerations are to be factored into project planning and implementation. The policy of the

U.S. Army Corps of Engineers is to avoid construction of Civil Works projects when HTRW is located within project boundaries or may affect or be affected by such projects.

1.4. Limiting Conditions and Methodologies Used. The techniques used to assess HTRW contamination within and adjacent to the project area consisted of review of Sanborn fire insurance maps, aerial photographs, and topographic maps, conducted interviews and site visits. Also, a search of federal and state environmental databases was conducted for areas that were added to the study. The scope of inquiry was limited to investigating onsite HTRW potential within the project boundaries as well as offsite HTRW potential within a reasonable distance from the project. No significant data gaps encountered or ASTM deviations.

2. Site Description.

2.1. Location and Legal Description. Location and descriptions of the Project Area are primarily taken from the September 1997 Rice Lake SFWA HREP Definite Project Report. The 6,800-acre Project Area lies on the right descending bank of the Illinois Waterway between River Miles (RM) 132.0 and 138.0, near Banner, Illinois. The project is located on the east side of U.S. Highway 24 in Fulton County, Illinois, approximately 24 miles southwest of Peoria, Illinois. The Project area is located adjacent to, and immediately downstream from, the Banner Marsh SFWA, which is also a HREP. The Rice Lake project area encompasses the land and water areas that comprise the Rice Lake SFWA (5,600 acres) and Duck Island peninsula (1,200 acres).

2.1.a Rice Lake State Fish and Wildlife Area. The Rice Lake SFWA has been managed for migratory birds and other wetlands-dwelling species since the Illinois Department of Natural Resources (DNR) began purchasing tracts of land in the project area during the 1940s, 1950s, 1960s, 1980s and 2000s. Site management by the State of Illinois includes operation of a pump station and water control structures that provide reliable food production for migratory birds. If the impacts of summer and fall flooding on the Rice Lake ecosystem were attenuated, the preferred habitat quality and quantity of the wildlife area could be improved.

2.1.b Duck Island. The Duck Island peninsula is a large holding that is almost completely surrounded by the Illinois DNR-owned project lands. The 1,200-acre Duck Island peninsula is a natural floodplain ridge that acts as a barrier between Rice Lake to the west and Big and Goose Lakes to the east. Approximately 600 acres of the property is leased for agricultural use and is planted in row crops (corn and soybeans) during the growing season. A tenant aggregate mining operation (See photo D002 in Appendix D), encompassing over 300 acres is located on the southern end of the peninsula, with another 50 acres in the extreme northeast tip of the peninsula.

2.2. Site and Vicinity Characteristics. The proposed Project Area is subject to potential recognized environmental conditions due to the close proximity of the property to mining, agricultural, and recreational areas along the Illinois Waterway. Coal mines, clay mines, and gravel pits are common along the Illinois Waterway in Fulton County. There is a large aggregate mining pit (Photos D003, D026, D039) at the southern edge and northeastern tip of Duck Island. The northern half of Duck Island is used for agricultural crop production. Public recreation

(boating, camping, hunting, etc.) is a common occurrence at the Rice Lake SFWA, and the area attracts over 150,000 visitors each year.

2.3. Current Uses and Adjoining Properties. Information was collected using USGS Quadrangle maps (Figures C4, C5 in Appendix C), 1998 Corps Illinois Waterway Navigation Charts (Figure C1), and aerial photographs (Figures C2, C3, C6) within and around the proposed project properties. These sources were utilized in order to determine the current uses of each proposed property and each adjoining property to the north, south, east, and west.

2.3.a Rice Lake State Fish and Wildlife Area. This proposed property is currently a refuge for migratory waterfowl and other wetland species. Adjoining properties consist of bottomland forest, agricultural fields, and undeveloped lands. There is an electrical power plant and a coal plant located approximately 2 miles northwest of the project area.

2.3.b Duck Island. This proposed property is currently used for aggregate mining and agricultural crop production. A homestead (Photos D004, D028, D043, D044) and a hunting cabin (Photos D034, D038) are also located on the property. The island is surrounded by the Illinois Waterway.

2.4. Descriptions of Structures, Roads, and Other Improvements on Project Lands. Below is a summary of improvements observed on project lands. USGS Quadrangle maps (Figures C4, C5), 1998 Corps Illinois Waterway Navigation Charts (Figure C1), and aerial photographs (Figures C2, C3, C6) were reviewed within and around the proposed Project Area. Several roads exist in the project area, as observed by examining the USGS 7.5-minute quadrangle. U.S. Highway 24 borders the western edge of the project area, several maintenance and management roads exist on levees throughout the project site, and one private unimproved road provides access to the gravel pit and farmland on the Duck Island peninsula.

There are several recreational shelters and facilities located near Rice Lake including a camping area and a boat ramp (Photos D017, D056, D057). Several duck blinds and other small structures used for hunting (Photo D038) also exist in the area. On Duck Island, there was a mobile home used as a hunting lodge (Photo D034), and a farmstead, which includes several barns and other small structures (Photo D004, D028, D040, D043, D044). Electricity was provided to the homestead by power lines (Photo D010, D022) from the mainland. These structures were removed by the DNR in 2001.

Remains of Copperas Creek Lock and Dam, which was constructed in 1877 (Photo D011, D012, D013, D014, D015, D016), and a restaurant (Photo D055) are visible on the property. A fish hatchery is located across the Illinois River east of the project area in the Sand Ridge State Forest. Northwest of the project area, on the opposite bank of the river, there is an electrical power plant and a coal company (Photo D029, D047). Underground intake and discharge pipelines serving these industrial facilities run south (downstream) of the project area. Two concrete dams exist south of the electrical power plant. Pumping stations exist at two points on the left bank of the Illinois Waterway. The Illinois DNR Voorhees Moist Soil Management Units (Photo D052-D054) are located northeast of the project area.

3. Preliminary Information Review.

3.1. Title Records. A title search can provide information on environmental liens, disclosures, and the uses for a property. A chain of title for the project area has been performed by Environmental Data Resources, Inc (EDR) and is included in Appendix E. According to the information obtained, the people of the State of Illinois, Department of Natural Resources own the project area. A portion of the project area is leased to Duck Island Sand and Gravel Company. Overall, the chain of title did not indicate any recognized environmental conditions.

3.2. Environmental Liens or Activity and Use Limitations. The existence of environmental liens or activity limitations were not examined at this time. If environmental liens or activity limitations are discovered during the real estate acquisition phase, this Phase I ESA will be revisited.

3.3. Specialized Knowledge Review. The following Project Sponsor(s)/ Contributor(s), Project Engineer(s), and Project Team Members, listed below, were interviewed for any specialized knowledge regarding the existence of hazardous substances, HTRW, or other regulated contaminants on project properties. No one interviewed recalled any actual or specialized knowledge indicating the existence of recognized environmental conditions on the project properties.

Darron Niles (CEMVR-PM-F) was interviewed on 22 February 2010 and was also consulted several times during the preparation of this report. Mr. Niles has no specialized knowledge regarding hazardous substances, petroleum products, or other regulated materials existing within the study area.

Rachel Fellman (CEMVR-EC-DN) was interviewed on 22 February 2010. Ms. Fellman is the current project engineer for this project. She has no specialized knowledge of hazardous substances, petroleum products or other regulated materials existing within or adjacent to the study area.

Rod Hallstrom (USACE-RE) was interviewed on 13 July 2001 regarding Real Estate issues at Rice Lake. Mr. Hallstrom was not aware of any historical use of the land for something other than natural wildlife habitat, agriculture, aggregate mining, and hunting. He provided names and contact information for private individuals owning property on Duck Island, including the phone number for the quarry. The contact information for the owner of the homestead and agricultural field is located in the Conversation Records (Appendix G).

Bill Douglass (IL DNR) is the refuge manager for the Banner Marsh and Rice Lake projects. Mr. Douglass was interviewed on 8 January 2010. Mr. Douglass has no knowledge of any mining-related HTRW concern. However, a leaking underground storage tank (LUST) was removed from the west side of Rice Lake. This LUST site is outside of the Project work area. The LUST incident is considered High Risk by the IL EPA.

3.4. Valuation Reduction for Environmental Issues. At this time, there is no knowledge of a reduction in any proposed Project Area's valuation due to environmental issues. If a reduction in value is discovered prior to real estate acquisition, this Phase I ESA will be revisited.

3.5. Owner, Property Manager, and Occupant Information. The following information was obtained during an interview with Rod Hallstrom on 13 July 2001 and from the title search. The proposed project property is owned all by the Illinois Department of Natural Resources. The Duck Island peninsula was purchased by the Illinois Department of Natural Resources in 2001. Duck Island was previously owned by several private landowners including Jim Smith, who owned the agricultural field, and Roger Nelson, who owned the homestead. The quarry on Duck Island is leased and operated by the Duck Island Sand and Gravel Company.

4. Records Review.

The purpose of a records review is to obtain and review records that will help identify recognized environmental conditions concerning the property. Some of the records reviewed pertain not just to the property, but also to properties within an approximate minimum search distance, in order to help assess the likelihood of problems from migrating hazardous substance or petroleum products. Factors considered in determining the approximate minimum search distance include the density of the setting, the distance that the hazardous substances or petroleum products are likely to migrate based on local geologic or hydrogeologic conditions, and other reasonable factors. This records review included the site assessment report from environmental databases, maps, and air photos.

4.1. EDR Site Assessment Report. The site assessment report from EDR details federal and state records searches to determine if Recognized Environmental Conditions (REC's) have been at or within the vicinity of the Project area. Detailed descriptions of the databases that were reviewed and information related to the locations of the REC's are provided in the EDR report. The EDR report is included in Appendix F. The results of the database review are listed below.

Within 1 mile radius of the Project area:
No REC's were listed in any of the databases searched by the EDR.

There were eleven "unmapped" sites listed in the database. Unmapped sites are properties with environmental concerns, but there is insufficient information to allow accurate placement on the EDR map. The eleven sites were reviewed and nine were determined to be outside the one mile search radius and do not appear to present an REC associated with the Site. The remaining two consisted of the Rice Lake SFWA LUST incident and the aggregate mining operation on Duck Island.

4.2. EnviroFacts. EnviroFacts, created by the Environmental Protection Agency (EPA), is a database warehouse implemented in the Oracle Relational Database Management System and is

available through the Internet for public access. It has the ability to retrieve information several environmental databases:

When an EnviroFacts database query was conducted one facility was identified within a 1 mile radius. The facility, Fontana's Amoco, is located nearly 1 mile northwest of the Project Area and is not considered a REC based on distance and lack of any reported releases. Appendix F summarizes the details and results of the database search.

4.3. Illinois Environmental Protection Agency Leaking Underground Storage Tank (LUST) Database. LUST Section is responsible for the regulation of underground storage tank systems used for the storage of regulated substances, primarily petroleum products. Staff in the section work with the owners of sites on the detection, prevention and correction of releases of products from underground tanks.

A database query indicated one LUST site within the Project Area. LUST Incident Number 940828 is located on the west shore of Rice Lake, near the SFWA administration building. The LUST incident is not considered a REC based on its distance and location on the opposite side of Rice Lake from work in the Project Area. However, any future work in the vicinity of the SFWA administration building needs to take the LUST incident into consideration. Appendix F summarizes the details and results of the database search.

4.4. Illinois Environmental Protection Agency Site Remediation Program (SRP). The SRP cleanup program provides Remediation Applicants (i.e., any persons seeking to perform investigative or remedial activities) the opportunity to receive IEPA review, technical assistance and no further remediation determinations from the Illinois EPA. The SRP database identifies the status of all voluntary remediation projects administered through the Pre-Notice Site Cleanup Program (1989 to 1995) and the Site Remediation Program (1996 to the present).

A database query indicated no SRP projects in the Project Area. Appendix F summarizes the details and results of the database search.

4.5. National Response Center. The National Response Center is the sole federal point of contact for reporting oil and chemical spills. The National Response Center supports an online query system that makes all oil and chemical spill data reported to the Center available via the internet.

A database query indicated 4 incidents or releases that were greater than 1 mile of the Project Area. None appear to be in the immediate vicinity of the project areas. The incidents are not considered REC's based on distance from the Project Area. Appendix F summarizes the details and results of the database search.

4.6. Additional Environmental Record Sources. Water quality monitoring was performed at Rice Lake and was documented in the 1997 Rice Lake State Fish and Wildlife Area HREP Definite Project Report. The report concluded that, on occasion, pH values exceed 9.0 and dissolved oxygen concentrations fall below 5 mg/l. The wide swing in pH values and dissolved oxygen is due to the shallow nature of the lakes coupled with the aquatic vegetation present. This report also concluded that there is relatively high concentration of suspended solids in the lake because of the resuspended bed material and algal biomass. There was no mention in the report of any recognized environmental conditions affecting water quality. Despite the history of coal mining in the area, the report had no mention of the presence or absence of acid mine drainage in the Rice Lake State Fish and Wildlife Area.

The Illinois DNR Department of Mines and Minerals was also consulted to determine the current state of mining operations in the area. According to the Mines and Minerals database query, two surface coal mine operations are located within one mile of the Project Area.

4.7. Physical Setting Source(s). Physical setting information for the project area and the general surrounding area was collected using USGS United States Geological Survey Quadrangle maps (Figures C4, C5), 1998 Corps Illinois Waterway Navigation Charts (Figure C1), aerial photographs (Figures C2, C3), a Phase I Archeological Survey of the Rice Lake State Conservation Area (Ferguson and Hajic, 1997), maps of coal mine information for Fulton County (Figure C4; ISGS, 2000b), a report discussing the coal geology of Illinois (ISGS, 2000a), a handbook of Illinois stratigraphy (ISGS, 1975), and a geomorphology guide to the Illinois River Valley (Hajic, 2000).

Rice Lake SWFA, consists of large backwater lakes surrounding several lens-shaped islands, the largest of which is Duck Island. The Project Area is one of the few areas along the Illinois River free of artificial levees and agriculture-drained flood basins (Ferguson and Hajic, 1997). The surface hydrology in this area is controlled by subtle topographic features, a recently constructed dike at the narrows between Duck Island and Hoxie Ridge, and a pumping station connecting Copperas Creek to the Voorhees Moist Soil Management Units. Regional groundwater is expected to follow the general topographic trend from valley wall to Illinois River. Where the hydraulic gradient has the opportunity to intersect the ground surface, such as the low gradient, slopewash fans at the base of the bluffs, springs may appear.

One major topographic feature is a levee of the Illinois River that runs along the eastern edge of Big Lake, separating Big Lake from Goose Lake and Pond Lily Lake. The unnamed island in Pond Lily Lake was an island in the Illinois River channel during the time the relic natural levee formed. The modern and pre-modern Illinois River natural levee systems run along the eastern bank of Pond Lily Lake. Other major topographic features that may control local hydrology are the extensive alluvial fans and colluvial slopes descending from the limestone bluffs and tributaries draining the uplands to the west of project area. The largest of these features being the Duck Creek and Buckheart Creek alluvial fan complex, which stretches along the valley wall from Duck Island to Buckheart Creek; and the Copperas Creek alluvial fan, which stretches from the valley wall, alongside Hoxie Ridge and the Voorhees Moist Soil Management Units, to the mouth of Copperas Creek north of the Copperas Creek Lock and Dam ruins.

The project area, Rice Lake State Conservation Area, is in an area of complex geologic history of significant economic importance. In terms of bedrock geology, the project area is near the contact between the Carbondale and Spoon Formations. The Spoon Formation of the Kewanee Group, which dates to the early Des Moines series of the Pennsylvanian, contains the first widespread limestones and coals deposited in Illinois. According to the ISGS Handbook of Illinois Stratigraphy, this formation can vary in thickness from a few feet to less than 100 feet in northern and western Illinois to greater than 350 feet in southern Illinois. The Carbondale Formation of the Kewanee Group, which dates to the late Des Moines series of the Pennsylvanian, consists of cyclothems of interbedded limestone, shale, sandstone, and coal. According to the ISGS Handbook of Illinois Stratigraphy, this formation can vary in thickness from less than 150 ft in western and northeastern Illinois to greater than 400 ft in southern Illinois, and contains the principal coal seams found in Illinois:

- Danville (No. 7) Coal Member
- Herrin (No. 6) Coal Member
- Springfield (No. 5) Coal Member
- Colchester (No.2) Coal Member, unconformably over the Spoon Formation

The Colchester and Springfield Coal Seams were actively mined in the adjoining areas. The Springfield coal seam outcrops in Illinois River limestone bluffs and valley walls, which overlook the SFWA as well as outcropping in the valley walls and upland areas of Duck Creek and its tributaries. This allowed for extensive underground drift and aboveground strip mining of the Springfield coal seam. Mining of the Springfield seam occurred from the early 1910s to the mid 1980s. The unconformable contact between the Spoon and Carbondale formations can be found in this area along the Illinois River floodplain. Since the Colchester seam directly and uncomfortably overlies the Spoon Formation, the seam is buried by a thin layer of Quaternary alluvial sediments. Therefore, the Colchester coal seam was easily strip mined, as evidenced by the United Electric Coal Company's Banner Marsh Coal Strip Mine located immediately north of the state conservation area that was mined from 1959 to 1974. Mining at Banner Marsh ended before the Federal Surface Mining Control and Reclamation Act of 1977 (Public Law 95-97) was passed. It is not known if the Banner mine was effectively reclaimed under Illinois' Abandoned Land Mines and Water Reclamation Act (20 ILCS 1920).

The Rice Lake State Conservation Area has not been mined for coal. However, the existence of coal-bearing rocks in the subsurface could influence construction activities. When the Banner Marsh administrator, Bill Douglass, was interviewed he mentioned that gob and acid mine drainage became a concern during the construction phase of Banner Marsh EMP. If coal-bearing rocks are excavated and exposed to air and water, they may induce acidic drainage.

The area's late Pleistocene and Holocene geological history indicates that the Colchester Coal Seam, if it does extend beyond the Banner Marsh area, may exist under a thin veneer of material on Duck Island, Miserable Island, and Hoxie Ridge. These high points on the project area are erosional residuals related to a series of jökulhlaups, or interglacial glacial outburst floods, commonly known as the Kankakee Torrent (Hajic, 2000), which occurred at the end of the

Wisconsinan (about 15,500 years B.P.) This event cut the upper Illinois River Valley bedrock valley and widened the middle and lower bedrock valley reaches. In this reach of the valley, the western bedrock valley wall was carved westward at least three kilometers (Ferguson and Hajic, 1997), producing streamlined islands of bedrock cores called erosional remnants, which are now high points in the flood basin. These erosional remnants are mantled by a thin debris of sand, gravel, and boulders that represent waning-torrent flood bar deposits. The broad depressions on both sides of Duck Island, now occupied by Rice Lake, Miserable Lake, and Big Lake, represent only part of the former flood channel. Since Duck Island, Miserable Island, and Hoxie Ridge are erosional remnants, they are likely to contain coal-bearing rocks of Pennsylvanian age as the surrounding bedrock was scoured away by the flooding.

Following the Kankakee Torrent, there were several other lesser magnitude floods caused by preglacial lake discharges though the Chicago Outlet of the Lake Michigan basin. Following these events, the former flood channel began to infill to produce the Cahokia Alluvium. The Handbook of Illinois Stratigraphy (ISGS, 1975) characterizes Cahokia Alluvium as poorly sorted silt, clay, and silty sand with locally contained lenses of sand and gravel deposited largely during the Holocene age (i.e., recent alluvium). The thickness of the Cahokia Alluvium deposit is generally less than 40 feet in the Illinois River Valley, but may be up to 60 feet deep in some locations. In this reach of the valley, the Cahokia Alluvium is derived of upland materials that were delivered to the western margin of the Rice Lake basin by tributary streams and slopewash (Ferguson and Hajic, 1997.) East of Duck Island and Big Lake, overbank flooding of the Illinois River built the now-relict natural levee system. Frequently, overbank flooding left thick piles of river borne material in the flood basins occupied by Rice and Big Lakes. Some time during the Holocene, before 2000 years B.P., the Illinois River shifted eastward, abandoning one levee system and beginning to create another to the east (Ferguson and Hajic, 1997.) The preservation of the mid-channel island in Pond Lily Lake is evidence that the shift was an abrupt channel migration, not gradual lateral migration, of the Illinois River.

4.8. Historical Use Information on the Property and Adjoining Properties. Table 1 describes the available historical coverage for the project study area. A copy of all historical documents are located in Appendix C.

Table 1. Historical Use Records Coverage.

Years		Document(s)
2000	2005	
1995	2000	"1998 Illinois Waterway Navigation Charts."
1990	1995	"1995 Infrared Aerial Photographs."
1985	1990	
1980	1985	"Duck Island, IL USGS Quadrangle, 1982."
1975	1980	
1970	1975	
1965	1970	
1960	1965	
1955	1960	
1950	1955	
1945	1950	
1940	1945	

1935	1940	
1930	1935	"1930's Brown's Photos" and "1930's Brown's Maps"
1925	1930	"1929 Browns Map"
1920	1925	
1915	1920	
1910	1915	"1912 Project Area Map."
1905	1910	
1900	1905	"1902-1904 IWW Woermann Maps, 34"
1895	1900	"1895 Project Area Map"
1870	1895	"1871 Project Area Map"

1900-1905. Most of the project area is completely undeveloped, and the land is composed entirely of timber and brush. The Copperas Creek Lock and Dam, icehouse, and the gun club have been constructed (Photos D011-D016). An area of the northern section of the southern half of Duck Island has been cleared, and a homestead has been constructed on the property. No signs of coal mining in the vicinity were observed.

1910-1915. The property currently known as Duck Island is drawn on the map and referred to as "Beebe's Island." More buildings and development have occurred on the island, and approximately 95% of the island was being used for agricultural crop production. A school was constructed north of Rice Lake. An area southwest of Duck Island has been cleared and drained. Levees have been constructed along the shore of the Illinois River in various locations for flood protection of adjacent agricultural fields.

1930-1935. Additional land has been cleared for agricultural use and development. Structures on Duck Island remain standing. No other significant changes were noted.

1980-1985. A substantial amount of coal strip mining has occurred in the Banner Marsh area. The southern segment of Duck Island has been extensively utilized for aggregate mining, resulting in large quarry pits filled with water. Additional levees have been constructed to protect property from flood events. The Copperas Creek Lock and Dam is no longer in operation. Industrial facilities have been constructed northeast of the project area.

1990-1995. No significant changes have occurred on the property. The infrared photographs clearly show the quarry operation at the southern end of Duck Island, and the agricultural fields at the northern end.

5. Site Reconnaissance.

5.1. Site Safety. Investigators followed all generic requirements of the Corps Safety and Health Requirements Manual (EM 385-1-1) and the Safety and Occupational Health Requirements for HTRW Activities (ER 385-1-92). Site safety information was obtained from current aerial photographs and informal interviews with members of the HREP team.

Assessment methods did not involve intrusive techniques, such as collecting and analyzing soil samples at the placement sites for this report. Site reconnaissance information was obtained by team members by way of onsite visitation, telephone conversations, and informal interviews.

5.2. Exterior Observations. A site reconnaissance visit was conducted on March 28, 2001 and August 3, 2001. Rachel Fellman (EC-DN) also visited the Project Area numerous times in Fall and Winter of 2009

(1) Storage Tanks, Vent and Fill Pipes. No vent or fill pipes, vacant concrete pads, or decrepit pumps were discovered in the project area. Storage tanks were discovered at the gravel pit, and a propane tank was observed at the hunting lodge. No signs of spills were observed.

(2) Solid Waste Disposal and Fill Dirt. Site reconnaissance did not reveal any indications of fill dirt, soil piles, disturbed soil surfaces, construction debris, or demolition debris on the project area except for evidence of previous dredge material placement immediately north of the historic Copperas Creek Lock and Dam. There was no indication of illegal dumping of household trash or refuse, recreational litter, appliances, automotive batteries, automotive parts or debris, tires, drums, or other forms of solid waste on the project area. Additionally, there were no indications of solid waste incineration or burning activities on project area.

(3) Stained Soil and Pavement. Site reconnaissance did not reveal any indications of stained soil, leaks, or spills associated with leaks, spills, discharge, or dumping.

(4) Stressed Vegetation. No superficial indications of contamination, such as unexplainable stresses to the ecosystem, were noted.

(5) Wells. No indications of the property being served by private well or non-public water systems were observed. Site reconnaissance did not indicate the existence or suspected existence of dry wells, irrigation wells, injection wells, abandoned wells, or other forms of wells.

(6) Pits, Ponds, and Lagoons. No pits, ponds, or lagoons were observed on project area. No evidence indicating the past presence of pits, ponds, or lagoons on project area were observed. No evidence indicating the past or present existence of pits, ponds, or lagoons on adjacent properties were observed.

(7) Industrial Waste Discharge. No discharge points or drainage systems other than storm water drainage were observed on project area. Drainage tiles and drainage lines are suspected to exist under flat or poorly drained agricultural fields.

(8) Septic Systems. Site reconnaissance did not reveal any reason to suspect the existence of septic systems on project area. However, structures on project area including the hunting club must have some means of disposing of sewage; therefore, it is possible that there are septic systems located on Duck Island.

(9) Lead-Based Paint. Several old, dilapidated, buildings and structures are located on Duck Island. Since these buildings were constructed prior to the 1960s, these structures were possibly painted with lead-based paint.

(10) Polychlorinated Biphenyls (PCBs). PCBs are mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties ranging from oily liquids to waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper and many other applications. No indications of PCBs were identified on or adjacent to the project area. No PCB "boneyards" or suspicious pits where PCB-containing materials could be dumped were seen on or adjacent to the target property. However, any pole-mounted transformers on the project sites should be treated as PCB-containing until testing of the units shows otherwise. Pole-mounted transformers most likely exist in the target area, but were not observed during site reconnaissance. Heavy hydraulic machinery was observed on Duck Island Sand and Gravel property during site reconnaissance, and it is reasonable to assume that similar equipment has been used at the quarry in the past. As with most hydraulic equipment, small leaks and greasy areas were observed near moving parts. Hydraulic fluids have historically been a potential source of PCBs.

5.3. Interior Observations. Structures and buildings on target properties include a hunting lodge, several old duck blinds and cabins. The structures were not internally examined for HTRW concerns because rights of entry were not granted.

6. Interviews.

This section documents interviews that were conducted in regards to HTRW concerns associated with the Rice Lake HREP. Copies of Conversation Records are located in Appendix G.

6.1. Interviews with Owners. Due to the wildlife refuge and agricultural nature of project area, landowners were not interviewed.

6.2. Interviews with Site Managers. Two interviews (2001 and 2010) were conducted with Bill Douglass of the Illinois State Fish and Wildlife agency. Bill has no specialized knowledge of HTRW concerns in the project area besides the LUST incident, and has seen no evidence of coal mining in the Rice Lake conservation area, or on Duck Island. He also pointed out that the Duck Island Hunting and Fishing Club and the Rice Lake Hunting and Fishing Club may be potential sources of lead contamination from ammunition. The LUST incident is located outside the Project work area.

6.3. Interviews with Occupants. No occupants were identified to interview.

6.4. Interviews with Local Government Officials. Although mandatory to meet or exceed ASTM standards, interviews with local fire departments and local health/environmental departments were not considered applicable.

6.5. Interviews with Others. An interview was conducted with Craig Schoonover of Freeman United Coal on 10 July 2001. To the best of his knowledge, Craig Schoonover is not aware of significant environmental conditions at Rice Lake Conservation Area as a result of mining operations. He is not aware of any problems associated with mining in the area, from his company or historical mining operations. He is not aware of acid mine drainage, or gob piles in the area. He stated that his company is in compliance with their permits, and has had "about 1 violation in the past 10 years for suspended solids."

Central Illinois Power Company was contacted by telephone on three separate occasions. No representatives were available to answer environmental liability questions. No representatives contacted the District in response to the telephone inquiries.

A manager at Duck Creek Sand and Gravel was interviewed on 18 July 2001 regarding the nature of the operations at the quarry on Duck Island. Dennis indicated that the facility currently mines sand and mixed gravel ranging in size from pea gravel to 2" CA-6 material. To the best of his knowledge, coal has never been mined from the quarry on Duck Creek. Also, to the best of his knowledge, there have never been any spills of gasoline or other hazardous substances at the quarry, with the exception of small leaks from large mechanical equipment. The quarry has been operating under current ownership for the past 5 years.

7. Findings.

This section summarizes known or suspect environmental conditions associated with the property, and may include current recognized environmental conditions, historical recognized environmental conditions, *de minimus* environmental conditions, and other environmental conditions.

(1) Aggregate Mining Facility. As indicated in the site-specific information, records review, site reconnaissance, and interviews, an aggregate mining facility is located at the south end of Duck Island (Photos D002-D003). Specifically, site reconnaissance indicated rusting drums (Photo D058), rusting storage tanks (Photos D025, D033, D035, D064, D065) and the potential of PCB-containing equipment (Photos D022, D063) existing on facility property. Small spills of hazardous substances such as gasoline used for the heavy equipment were reported in an interview with a quarry manager.

(2) Agriculture and Crop Production. As indicated in the site-specific information, records review, and site reconnaissance, project area exist on or adjoin crop production fields and a

farmstead (Photo D030).

(3) Public Recreation. As indicated in the site-specific information and preliminary information review, approximately 150,000 people visit the Rice Lake State Fish and Wildlife Area annually.

(4) Hunting Club. As indicated in the site-specific information, records review, and site reconnaissance, there have been several hunting clubs in the project area. Specifically, site reconnaissance revealed the existence of a propane tank and the potential existence of a septic system at "The Red Nose" Hunting Club, located at the north end of Duck Island (Photo D034).

(5) Coal Mining. As indicated in the site-specific information, records review, and interviews, extensive coal mining has occurred on land adjoining the project area (Figure C4).

(6) Copperas Creek Lock and Dam. As indicated in the site-specific information and records review, the State of Illinois operated a lock and dam along the Illinois Waterway on the project area (Figure C11, Photos D011-D016).

(7) Flotsam. During site reconnaissance, flotsam was observed on the project area. Typical flotsam included small refuse items and a rusty 55 gallon barrel (Photo D020-D021, D058, Site Recon. Notes-Appendix D).

(8) The LUST incident near the Rice Lake SFWA is currently undergoing remediation, and soil/groundwater contamination is located within 100 feet of the release. Closure of the incident is anticipated within 3 years. The LUST incident is located outside of the Project work area.

8. <u>Opinions.</u>

The section shall include the environmental professional's opinion(s) of the impact on the property of known or suspect environmental conditions identified in the findings section. The logic and reasoning used by the environmental professional in evaluating information collected during the course of the investigation related to known or suspect environmental conditions shall be discussed. The opinion shall specifically include the environmental professional's rationale for concluding that a known or suspect environmental condition is or is not currently a recognized environmental condition. Known or suspect environmental conditions identified by the environmental professional as recognized environmental conditions currently shall be listed in the conclusions section of the report.

(1) Aggregate Mining. The primary threat of HTRW from the aggregate mining facility would be to groundwater and surface water in the project area. Since there is substantial coal mining activity in the area surrounding Rice Lake, it is possible that at one time, the aggregate mining facility was mined for coal. Research into local geology showed that there was a stream that terminated in the area of the aggregate mine, deposing sediments in an alluvial fan. This deposited alluvial material is the source for the aggregate that is currently mined. There is no

evidence of coal mining ever occurring at the facility, and an interview with the manager of the quarry verified that to the best of his knowledge, coal has never been mined from his quarry.

The small amount of hydraulic fluid that may have leaked from machinery is not a significant source of PCBs. The primary concern with PCB contamination would be a site where used hydraulic fluid was regularly dumped. Site reconnaissance and information obtained from interviews revealed no signs of a habitual disposal site. Since this quarry is down gradient of the project area, and there is not a significant source of HTRW released into the environment as a result of the quarry's current or historical operations, this facility is a *de minimus* environmental condition.

(2) Agriculture and Crop Production. Site reconnaissance did not reveal any fertilizer, pesticide, or herbicide mixing areas on or adjacent to target properties. Fertilizers, pesticides, and herbicides applied to lands during the course of normal agricultural activities, not including mixing and cleaning activities, are exempt from CERCLA and RCRA regulations. Additionally, application of pesticides and fertilizer for normal agricultural activities is generally not the subject of government enforcement action, therefore a *de minimus* environmental condition.

(3) Public Recreation. Public recreation is not considered a meaningful source of HTRW, hazardous substance, or other regulated materials. Public recreation is therefore a *de minimus* environmental condition.

(4) Hunting Club. The hunting club has existed at the site since at least the 1930s. It is likely that hunters utilized some land for target practice, which could potentially lead to high concentrations of lead in the soil. Currently, waterfowl ammunition is manufactured with bismuth or tungsten, which was mandated in order to protect wetland areas from lead contamination. However, since the hunting club existed before the waterfowl ammunition laws were in existence, there may be elevated concentrations of lead in the soil surrounding the hunting lodge. The lead concentrations are most likely within maximum contaminant levels, and extensive soil sampling would be necessary to determine the exact concentrations. The risk of contamination from lead ammunition is minimal and does not warrant the expense that extensive soil sampling would require. Lead ammunition is therefore a *de minimus* environmental condition.

(5) Coal Mining. Although there is no evidence of coal mining within the project area, several sites in the vicinity have been extensively mined, and may or may not pose an environmental threat to the project area. Contamination from coal mining in the bluffs is expected to be contained within the confines of Duck Creek (both the historic and recent channeled form) and its tributaries, as well as any fluvial deposits associated with the creek. Contamination from coal mining immediately north of the Voorhees moist soil management units is expected to be contained within the confines of the reclaimed mine area, lower Copperas Creek, and recent fluvial deposits associated with the creek or Illinois River flooding events. Therefore, *de minimus* contamination may exist in the vicinity around the Voorhees moist soil management units and the private duck hunting club lands north of the conservation area. When

excavating the borrow material from south of Goose Lake, construction workers should cease work and notify the Project Engineer if ore-bearing rocks are exposed.

(6) Copperas Creek Lock and Dam Historic records did not indicate any significant spills, and no lingering stresses to the environment were observed, therefore the Copperas Creek Lock and Dam is a *de minimus* environmental condition.

(7) Flotsam. Site reconnaissance did not reveal any signs of intentional dumping or historical dumping sites. Solid waste concerns including small refuse items and an empty 55-gallon barrel appear to be flotsam that was washed ashore from the river during high water events. These findings are not considered a meaningful source of hazardous substances, HTRW, or other regulated materials, therefore a *de minimus* environmental condition.

(8) LUST Incident. The LUST incident is outside of the Project work area, and is localized to the release area. The incident is considered a *de minimus* environmental condition. No work may occur within the contamination plumes of the incident.

9. Conclusions.

A Phase I ESA was performed in general conformance with the scope and limitations of ASTM Practices E 1527-05 and E 1528-06 for the Project. This assessment has revealed that there is no evidence of recognized environmental conditions in connection with Project. Any exceptions to, or deletions from, this practice are described in Section 1 of this report.

No ESA can wholly eliminate uncertainty regarding the existence of recognized environmental conditions concerning a property. This assessment is intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with a property with reasonable limits of time and cost. Continuing the Environmental Due Diligence Audit process beyond this Phase I ESA to a Phase II ESA may reduce uncertainty, or reveal unidentified environmental liabilities. If any previously un-addressed recognized environmental condition should arise, this Phase I ESA will be revisited.

10. Recommendations.

It is recommended that no further HTRW assessment is needed. However, if any evidence of recognized environmental conditions is discovered during construction activities, operations should cease until Environmental Engineering Section, Design Branch, Engineering Division of the Rock Island District (MVR-EC-DN) is able to reassess the project area. Also if any coal-bearing rock are exposed and reacts with air and water during the excavating of the borrow material from south of Goose Lake, construction workers should cease work and notify the Project Engineer of the acidic drainage.

11. Signatures and Qualifications

CEMVR-EC-DN representative Steve Gustafson, P.G., was responsible for the preparation of this Phase I Environmental Site Assessment.

Prepared by _____

Date 3/10/2010

CEMVR-EC-DN representative Kara Mitvalsky, P.E., conducted review activities for this Phase I Environmental Site Assessment.

Reviewed by Kara N. Mitvalsky

Date 3/10/10

APPENDIX A
ENVIRONMENTAL LIABILITY, SPECIAL TERMINOLOGY, AND ACRONYMS

1. Environmental Liability

a. Corps Guidance. The Corps Engineering Regulation (ER) providing guidance for the conduct of Civil Works Planning Studies is contained in ER 1105-2-100. The policies and authorities outlined in ER 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects; DIVR 1165-2-9, Lower Mississippi Valley Division HTRW Policy for Civil Works Projects; and ER 405-1-12, Real Estate Handbook, were developed to facilitate the early identification and appropriate consideration of environmental liability in all the various phases of a water resources study or project. The risk of environmental liability is the probability of the Corps acquiring a legal obligation to make future expenditures due to the past or ongoing manufacture, use, release, or threatened release of hazardous substances or other regulated contaminants (USEPA, 1998). Expenditures may include response costs, attorney's fees, indirect costs, damages to natural resources, and expenses indebted by way of tort suits (Gaba, 1994). Possible phases of a water resources study or project may include reconnaissance; feasibility; pre-construction engineering and design; land acquisition; construction; and operations, maintenance, repair, replacement, and rehabilitation. Information developed during each phase should provide the rationale for proceeding with the next phase of reporting or project implementation.

b. Corps Policy. The Corps Directorate of Civil Works states explicitly in ER 1165-2-132 that Civil Works project funds are not to be employed for HTRW-related activities except as stated below, or otherwise specifically provided in law. Therefore, construction of Civil Works projects, such as periodic channel maintenance dredging, in areas contaminated with regulatory action levels of HTRW should be avoided where practical. Where HTRW contaminated areas or impacts cannot be avoided, response actions must be acceptable to all applicable or relevant and appropriate requirements. Costs of HTRW-related activities such as environmental investigations to identify the potential existence of HTRW (Phase I ESAs), investigations incorporating environmental sampling to confirm the existence of HTRW (Phase IIA ESAs), site characterization to recognize the nature and extent of HTRW (Phase IIB ESAs), and studies required to evaluate alternatives to avoid HTRW will be cost shared the same as cost sharing for the phase the project is in, if applicable. Costs of HTRW response actions, including the removal and remediation of HTRW contamination to applicable or relevant and appropriate requirements, are the full responsibility of the local sponsor for all cost-shared projects and a project cost borne by the Department of the Army for all non-cost shared projects, except where another Federal agency is responsible for the HTRW. Funding arrangements and responsibilities for HTRW response actions involving federally owned lands, including those administered by the Department of the Army, will be approved on an individual basis. All HTRW-related project costs borne by the Department of the Army will be part of any economic evaluation.

The Corps Directorate of Civil Works Policy Guidance Letter 34 provides formal instruction for civil works projects on areas contaminated by other regulated contaminants. As advised in the guidance, the cost of any response action (mediation, treatment, handling, or disposal)

required by applicable or relevant and appropriate requirements to reduce the risk of harm to human health and the environment, will be included in the design and cost estimate as part of the project cost. ER 1165-2-132 indicates in such cases, the land value included in the economic analysis will be the fair market value of the land considering the contamination, and the cost of any response action will be a construction cost.

c. Federal Environmental Laws and Regulations. Environmental liability is a direct result of recent environmental laws and regulations. Two forms of environmental laws exist: statutory law and case law. Statutory law is a general law written by a legislative body, such as the United States Congress or State Legislature, and enacted by an executive body, such as the President of the United States or a State Governor. Some examples of federal statutory law which may convey environmental liability are: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended; Clean Air Act (CAA) of 1970, as amended; Federal Water Quality Improvement Act of 1970, as amended by the Federal Water Pollution Control Act Amendment (FWPCA) of 1972, predecessor to the Clean Water Act (CWA) of 1977, and other amendments; Resource Conservation and Recovery Act (RCRA) of 1976, as amended by the Hazardous Sold Waste Amendments (HSWA) and other amendments; Toxic Substance Control Act (TSCA) of 1976, as amended; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA) and other amendments, in 1986 by the Emergency Planning and Community Right-to-Know Act (EPCRA), and in 1996 by the Lender Liability Law (LLL); Hazardous Materials Transportation Uniform Safety Act (HMTUSA) of 1990; Pollution Prevention Act (PPA) of 1990; and the Oil Pollution Act (OPA) of 1990.

Case law is created when a Federal, State, or Local judge interprets the meaning and intent of a statutory law and rules on a particular issue of the case. Case law can change rapidly and it can affect the interpretation of statutory laws, thereby creating instability on environmental liability risk assessments. Therefore, environmental professionals measure and manage the risk of environmental impact, whereas purchasers and their lawyers make business decisions based on risk tolerance.

The most far-reaching Federal statutory law that conveys environmental liability is CERCLA. CERCLA is strict, joint and several, and retroactive. Strict liability means that fault is not a prerequisite. Joint and several liability means that any of the potentially responsible parties (current or previous owners, operators, managers, or investors) in the lawsuit may be liable for the entire cost of the cleanup. Retroactive liability means that it does not matter when the pollutant was deposited on the property. It also does not matter if at the time the pollutant was released onto the property no laws were broken.

d. Environmental Due Diligence. There are only three allowable defenses to acquit potentially responsible parties of any environmental liability, as defined by CERCLA (42 USC 9601 and 9607 as amended by SARA): (1) Act of God, (2) Act of War, and (3) Act of a Third Party, otherwise known as the "innocent landowner defense." In order to qualify as an innocent landowner (Hejzlar, 1999), the purchaser must: (1) Acquire the site *after* the disposal or placement of hazardous substances on the property. (2) The purchaser did not know, nor had *no*

reason to know, that any hazardous substances were present on the property. In order to establish that the purchaser had *no reason to know* about the contamination, the purchaser must: (1) undertake *all appropriate inquiry* into the previous ownership and uses of the property, and (2) the appropriate inquiry is consistent with *good commercial and customary practice*. (Note: In lieu of proving *no reason to know*, the purchaser may qualify as an innocent landowner if they can establish, by preponderance of the evidence, that the property was acquired by eminent domain or inheritance.) An Environmental Due Diligence Audit, as defined by the U. S. Environmental Protection Agency (USEPA), serves to meet *all appropriate inquiry*. American Society for Testing and Materials (ASTM) Standards describe the *good commercial and customary practice* for conducting the appropriate inquiry.

The ASTM standards do not address whether requirements in addition to an appropriate inquiry (42 USC 9607(b)(3)(a) and (b)) have been met in order to qualify for CERCLA's innocent landowner defense. In addition to providing proof of due diligence, a defendant must the establish by a preponderance of the evidence that (a) he exercised due care with respect to the hazardous substance concerned, taking into consideration the characteristics of such hazardous substance, in light of all relevant facts and circumstances, and (b) he took precautions against foreseeable acts or omissions of any such third party and the consequences that could foreseeably result from such acts or omissions.

The USEPA recommends the use of a tiered Environmental Due Diligence Audit process to evaluate and manage the risk of environmental liability before leasing or purchasing a property (USEPA, 1998). This process is necessary in order to aid in minimizing or preventing Federal liability under CERCLA, and to reduce any threats to project workers and avoid costly delays associated with environmental abatement, correction, and/or remediation activities. This process reduces the risk of environmental liability by providing proof of due diligence to the court, as preponderance of the evidence, that the Corps is an "innocent landowner" and that "a third party" is responsible for any and all environmental liability.

Within the Department of the Army, an Environmental Due Diligence Audit is referred to as an Environmental Site Assessment (ESA). The ESA can involve three stages of investigation where Phase I is an initial reconnaissance assessment, Phase IIA is a project feasibility assessment that confirms the presence or absence of contaminants, and Phase IIB concluding the project feasibility assessment by determining the type, quantity, lateral and vertical extent of contamination in all affected media. Phase IIA and IIB assessments may occur in conjunction to expedite the investigation. American Society for Testing and Materials (ASTM) Standards E 1527 and E 1528 and other guidance documents provide a comprehensive guide for conducting Phase I ESAs. This Phase I ESA is based on a modified version of the ASTM E 1527 Phase I Environmental Site Assessments guidance and other appropriate assessment guidance such as the guidance on conducting Preliminary Assessments under CERCLA.

2. Special Terminology.

This section provides definitions and descriptions of terms used in this Phase I ESA that are critical for the understanding of this document.

Adjoining Property. Adjoining properties and adjacent properties refer to any real property or properties that have a contiguous or partially contiguous border with the property, or that would be contiguous or partially contiguous with that of the property but for a street, road, or other public thoroughfare separating them.

Approximate Minimum Search Distance. Some of the records reviewed pertain not just to the property, but also to properties within an approximate minimum search distance, in order to help assess the likelihood of problems from migrating hazardous substances or other regulated contaminants. Factors considered in determining the approximate minimum search distance (Table A1) include ASTM Standards E 1527 and E 1528, the density of the setting, the distance that hazardous substances or other regulated contaminants are likely to migrate, local geologic or hydrogeologic conditions, and other observable factors.

Table A1. Approximate Minimum Search Distance. Adapted from ASTM E 1527

Property	Minimum Search Distance miles (kilometers)
Federal and State-equivalent NPL Site	1 (1.6)
Federal and State-equivalent CERCLA Site	0.5 (0.8)
Federal RCRA Treatment, Storage, or Disposal Facility	1 (1.6)
Federal RCRA Generator	property and adjoining properties
Federal Emergency Response Notification Site	property only
Landfill and/or Solid Waste Disposal Site	0.5 (0.8)
Leaking Underground Storage Tank	0.5 (0.8)
State Registered Underground Storage Tank	property and adjoining properties

Hazardous Substance. Hazardous substances regulated under CERCLA include "hazardous wastes" under Sec. 3001 of the Resource Conservation and Recovery Act, 42 U.S.C. 6921 et seq; "hazardous substances" identified under Section 311 of the Clean Air Act, 33 U.S.C. 1321, "toxic pollutants" designated under Section 307 of the Clean Water Act, 33 U.S.C. 1317, "hazardous air pollutants" designated under Section 112 of the Clean Air Act, 42 U.S.C. 7412; and "imminently hazardous chemical substances or mixtures" on which EPA has taken action under Section 7 of the Toxic Substance Control Act, 15 U.S.C. 2606; these do not include petroleum or natural gas unless already included in the above categories. (See 42 U.S.C. 9601(14).)

Hazardous, Toxic, and Radioactive Waste (HTRW). From ER 1165-2-132. (1) Except for dredged material and sediments beneath navigable waters proposed for dredging, for purposes of this guidance, HTRW includes any material listed as a "hazardous substance" under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq. (CERCLA). (See 42 U.S.C. 9601(14).) (2) Dredged material and sediments beneath navigable waters proposed for dredging qualify as HTRW only if they are within the boundaries

of a site designated by the USEPA or a state for a response action (either a removal action or a remedial action) under CERCLA, or if they are a part of a National Priority List (NPL) site under CERCLA. Dredged material and sediments beneath the navigable waters proposed for dredging shall be tested and evaluated for their suitability for disposal in accordance with the appropriate guidelines and criteria adopted pursuant to Section 404 of the Clean Water Act and/or Section 103 of the Marine Protection Research and Sanctuaries Act (MPRSA) and supplemented by the Corps of Engineers Management Strategy for Disposal of Dredged Material: Containment Testing and Controls (or its appropriate updated version) as cited in Title 33 Code of Federal Regulations, Section 336.1.

Practically Reviewable. Information that is provided by the source in a manner and in a form that, upon examination, yields information relevant to the property without the need for extraordinary analysis or irrelevant data.

Project Site. The specific area required for any potential Civil Works water resource project.

Project Study Area. The total area being considered in a Civil Works project study. It includes the selected project sites and general surrounding area as well as any potential project sites and areas of project impact.

Reasonably Ascertainable. Information that is publicly available and obtainable from its source within reasonable time and cost constraints.

Recognized Environmental Conditions. The presence or likely presence of any hazardous substances or other regulated contaminants on a property under conditions that indicate an existing release, past release, or a material threat of release of any hazardous substances or other regulated contaminants into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or other regulated contaminants even under conditions in compliance with laws. The term is not intended to include *de minimus* conditions that generally do not present a material risk of harm to human health and the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

Target Property. The real property or properties, forming the project site, that is the subject of the environmental site assessment. Real property includes any buildings, other fixtures, and improvements located on the property or affixed to the land that will transfer, by way of a contractual relationship (navigational servitude; fee title; temporary or permanent placement, work, flowage, or access easement; dredge placement permit; letter of consent; intergovernmental agency Memorandum of Agreement; lease; assignable, irrevocable, or revocable license; permit; right-of-way; right-of-entry or right-to-trespass; hold harmless clause; or hand shake), to the Corps.

Other Regulated Contaminants. Those substances excluded from being a hazardous substance, but pose a potential health or safety hazard, and are regulated. Examples include, but are not limited to, many industrial wastes; naturally occurring radioactive materials; many

products and wastes associated with the oil and gas industry, lead, asbestos, geothermal exploration; fertilizers, herbicides, and pesticides.

Acronyms.

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AMD	Acid Mine Drainages
AML	Abandoned Mine Land
ASTM	American Society for Testing and Materials
BRS	Biennial Reporting System
CAA	Clean Air Act
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CEMVR	Corps of Engineers, Mississippi Valley Division, Rock Island District
CFR	Code of Federal Regulations
CORRACTS	Facilities subject to Corrective Action under RCRA
CWA	Clean Water Act
DMR	Discharge Monitoring Reports
DNR	Department of Natural Resources
ED-DN	Engineering Division – Design Branch, Environmental Engineering Section
EM	Engineering Manual
EMCI	EnviroFacts Master Chemical Integrator
EPA	Environmental Protection Agency
ER	Engineering Regulation
ERNS	Emergency Response Notification System
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Site Assessment
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FII	Facility Identification Initiative
FR	Federal Register
FWPCA	Federal Water Pollution Control Act Amendment
GICS	Grants Information and Control System
GIS	Geographic Information System
HMTUSA	Hazardous Materials Transportation Uniform Safety Act
HREP	Habitat Rehabilitation and Enhancement Project
HSWA	Hazardous Sold Waste Amendments
HTRW	Hazardous, Toxic, and Radioactive Waste
ICR	Information Collection Rule
IEMA	Illinois Emergency Management Agency
ISGS	Illinois State Geological Survey
L	Left Descending Bank
LLL	Lender Liability Law
LUST	Leaking Underground Storage Tanks
LQG	Large Quantity Generator
MPRSA	Marine Protection, Research, and Sanctuaries Act
NAAQS	National Ambient Air Quality Standard

NCC	National Computer Center
NCOD	National Contaminant Occurrence Database
NET	National Emission Trends
NFRAP	CERCLA Archive
NFR	No Further Remediation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRC	National Response Center
OAQPS	Office of Air Quality Planning and Standards
OSM	Office of Surface Mining's
OPA	Oil Pollution Act
PCB	Polychlorinated Biphenyl
PCS	Permit Compliance System
PPA	Pollution Prevention Act
R	Right Descending Bank
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RM	River Mile
RMP	Risk Management Plan
RODS	Record of Decision System
RTP	Research Triangle Park
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SFWA	State Fish and Wildlife Area
SIC	Standard Industrial Classification
SQG	Small Quantity Generator
SRP	Site Remediation Program
SSHP	Site Specific Safety and Health Plan
TRI	Toxic Release Inventory
TRIS	Toxic Release Inventory System
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, or Disposal Facility
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
WWW	World Wide Web

APPENDIX B
REFERENCES AND ABSTRACTS

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APPENDIX C
HISTORIC MAPS AND PHOTOGRAPHS

Years		Document(s)
2000	2005	
1995	2000	"1998 Illinois Waterway Navigation Charts."
1990	1995	"1995 Infrared Aerial Photographs."
1985	1990	
1980	1985	"Duck Island, IL USGS Quadrangle, 1982."
1975	1980	
1970	1975	
1965	1970	
1960	1965	
1955	1960	
1950	1955	
1945	1950	
1940	1945	
1935	1940	
1930	1935	"1930's Brown's Photos" and "1930's Brown's Maps"
1925	1930	
1920	1925	
1915	1920	
1910	1915	"1912 Project Area Map"
1905	1910	
1900	1905	"1902-1904 IWW Woermann Maps, 34"
1895	1900	"1895 Project Area Map"
1890	1895	
1885	1890	
1880	1885	
1875	1880	
1870	1875	"1871 Project Area Map"

Table C1. Historic Records Documentation

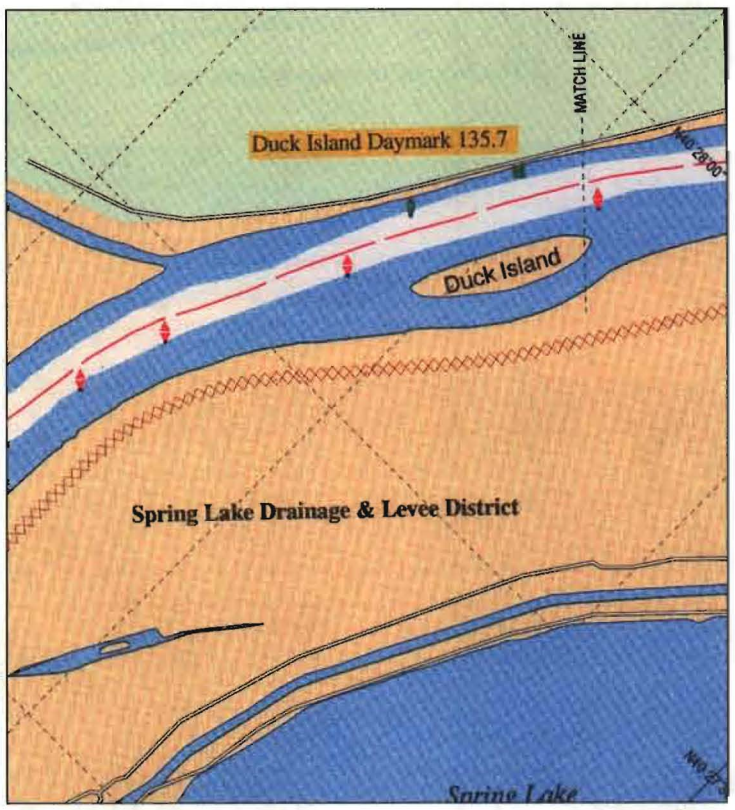


Figure C1. 1998 Illinois Waterway Navigation Charts.

Figure C2. 1995 Infrared Photo- Duck Island North/Central.

Figure C3. 1995 Infrared Photo- Duck Island South.

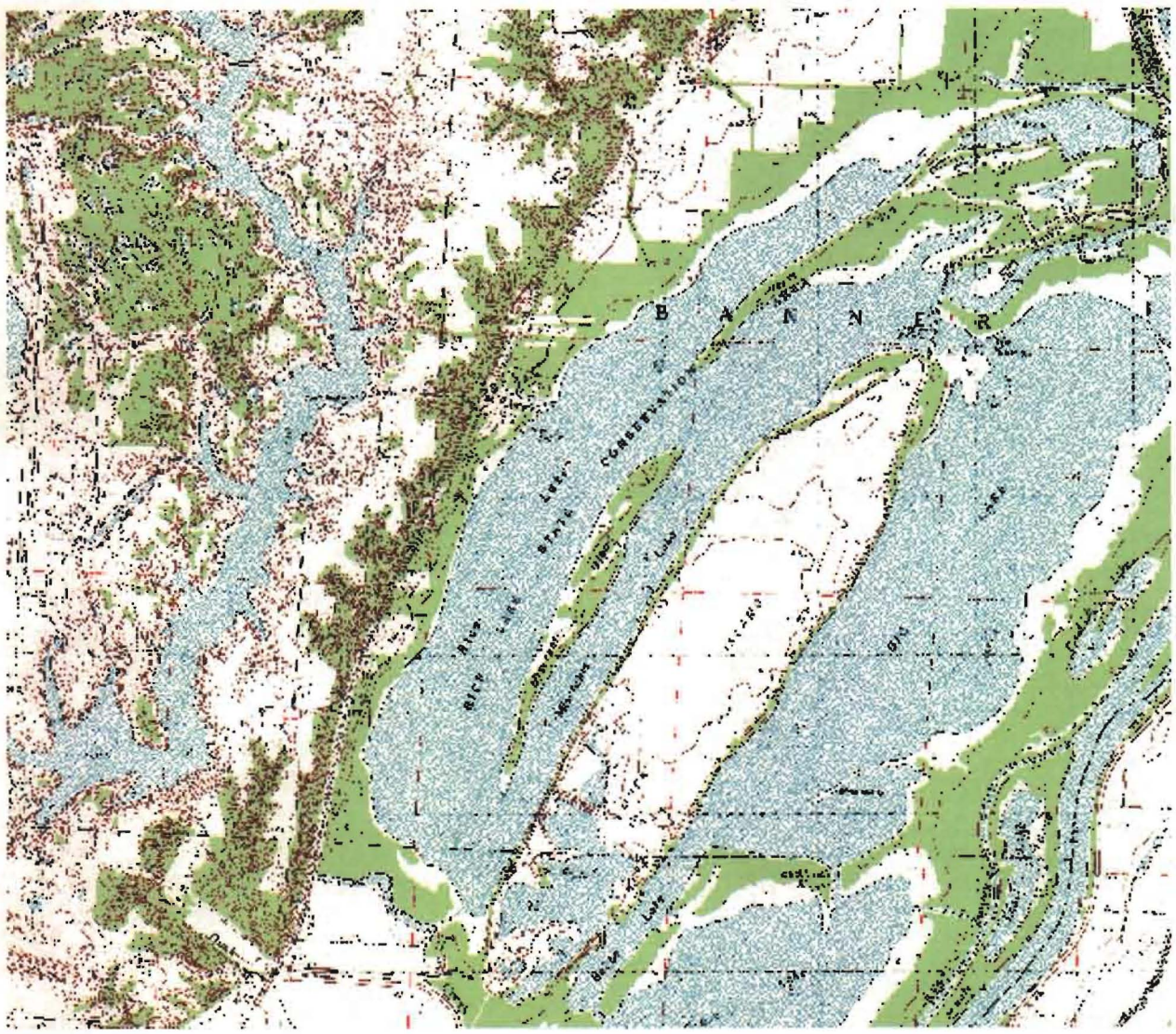


Figure C4. U. S. Geological Survey Duck Island, IL, 1982 7.5-minute quadrangle.

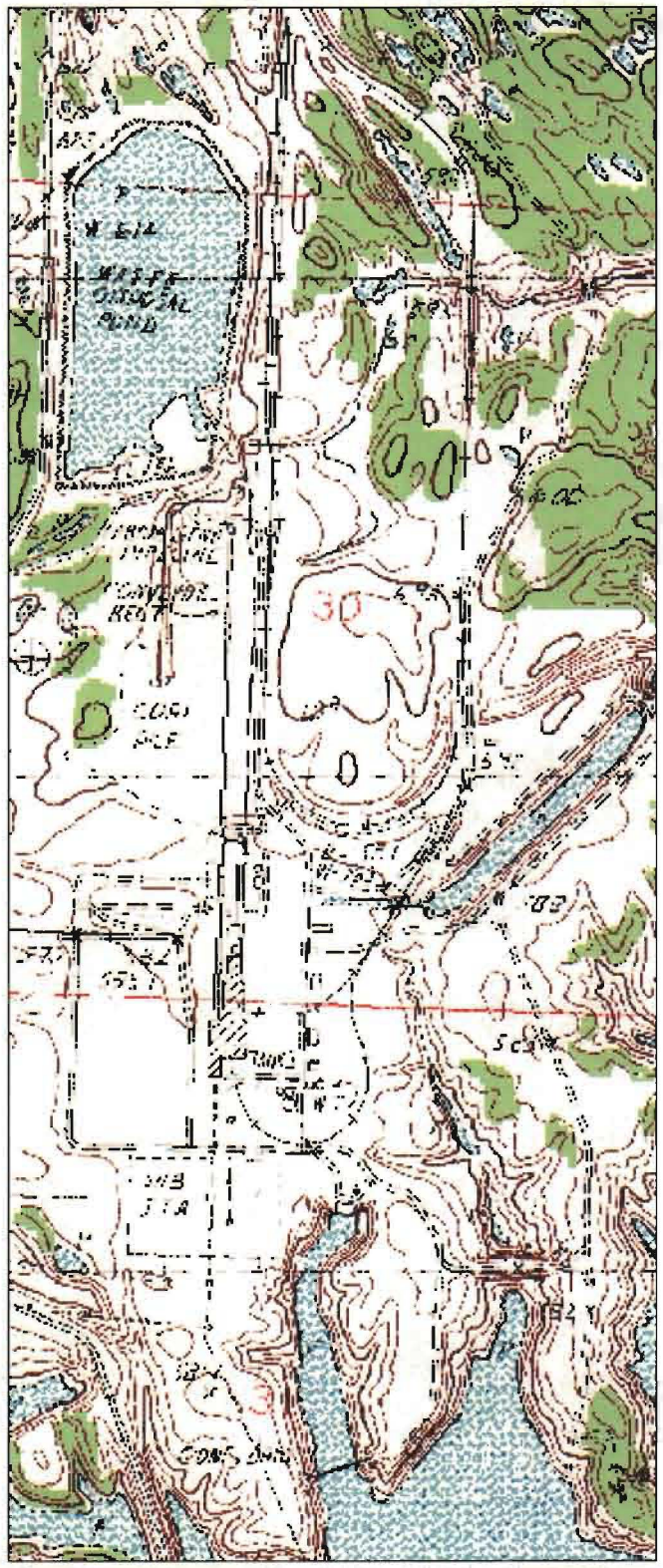


Figure C5. U. S. Geological Survey Duck Island, IL, 1982 7.5-minute quadrangle. United Freeman Coal Company and Central Illinois Light Company (CILCO).

Figure C6. 1932-1936 Browns Photo.

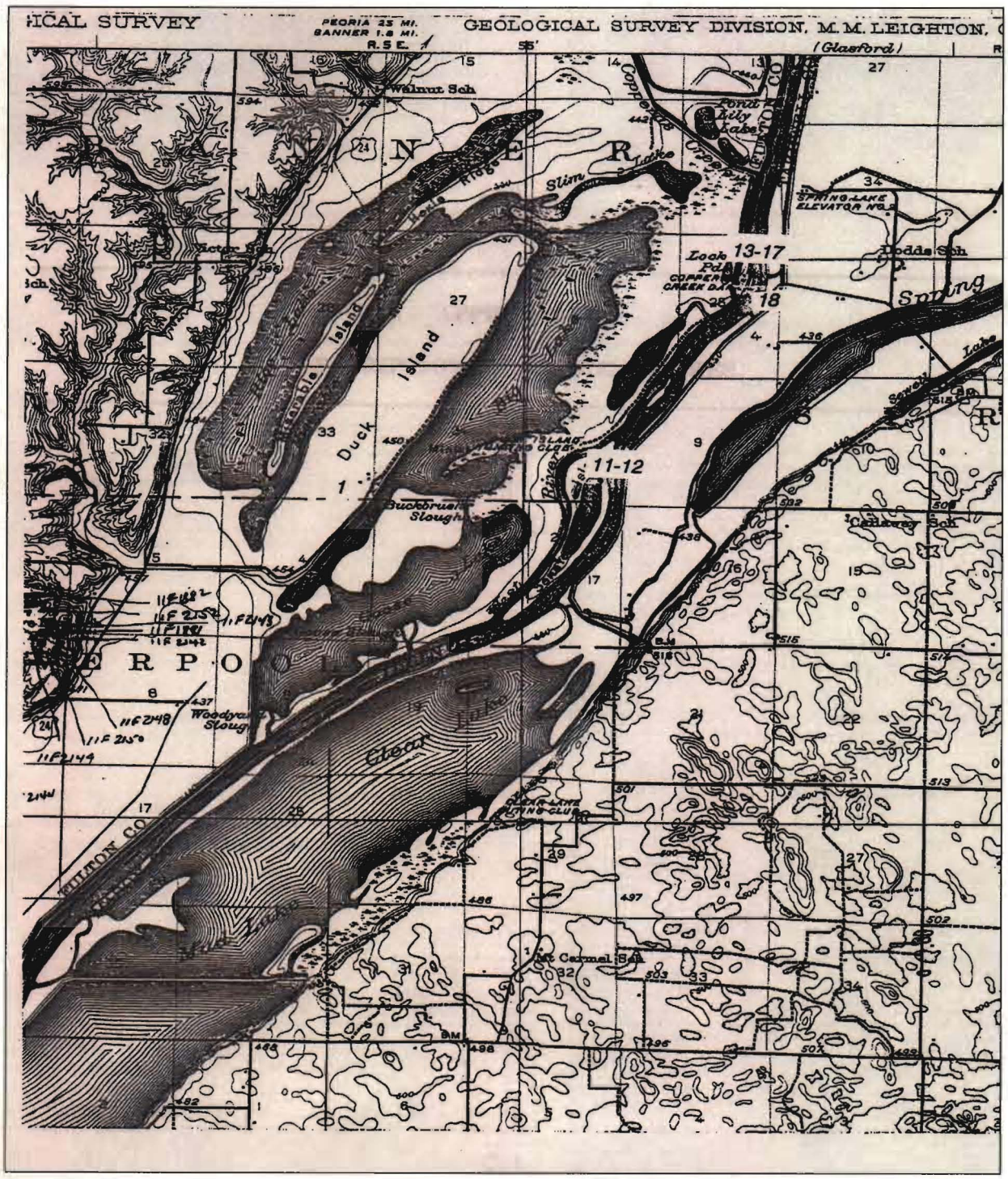


Figure C7. 1932 Project Area Map.

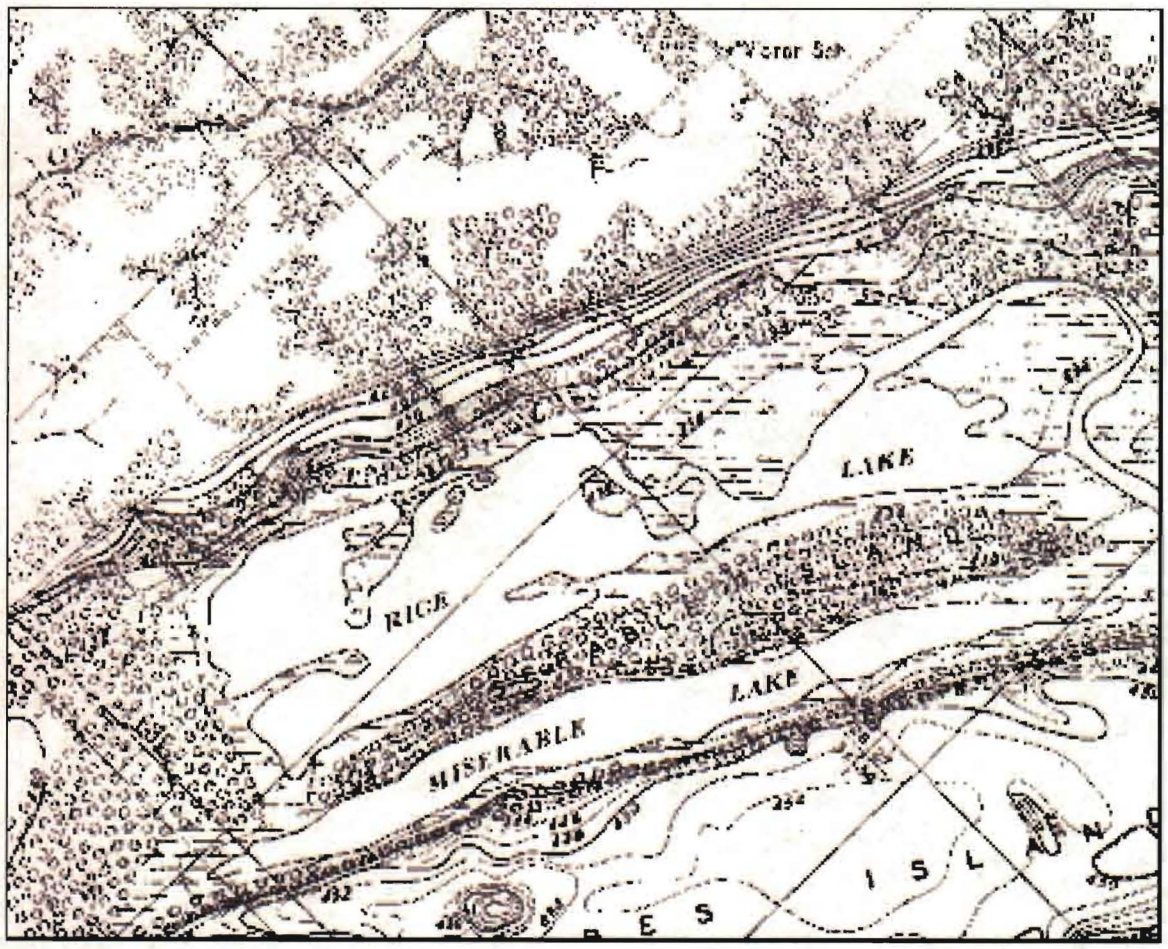


Figure C8. 1929-1930 Browns Map.

Figure C9. 1912 Project Area Map.

Figure C10. 1902-1904 Woermann Map.

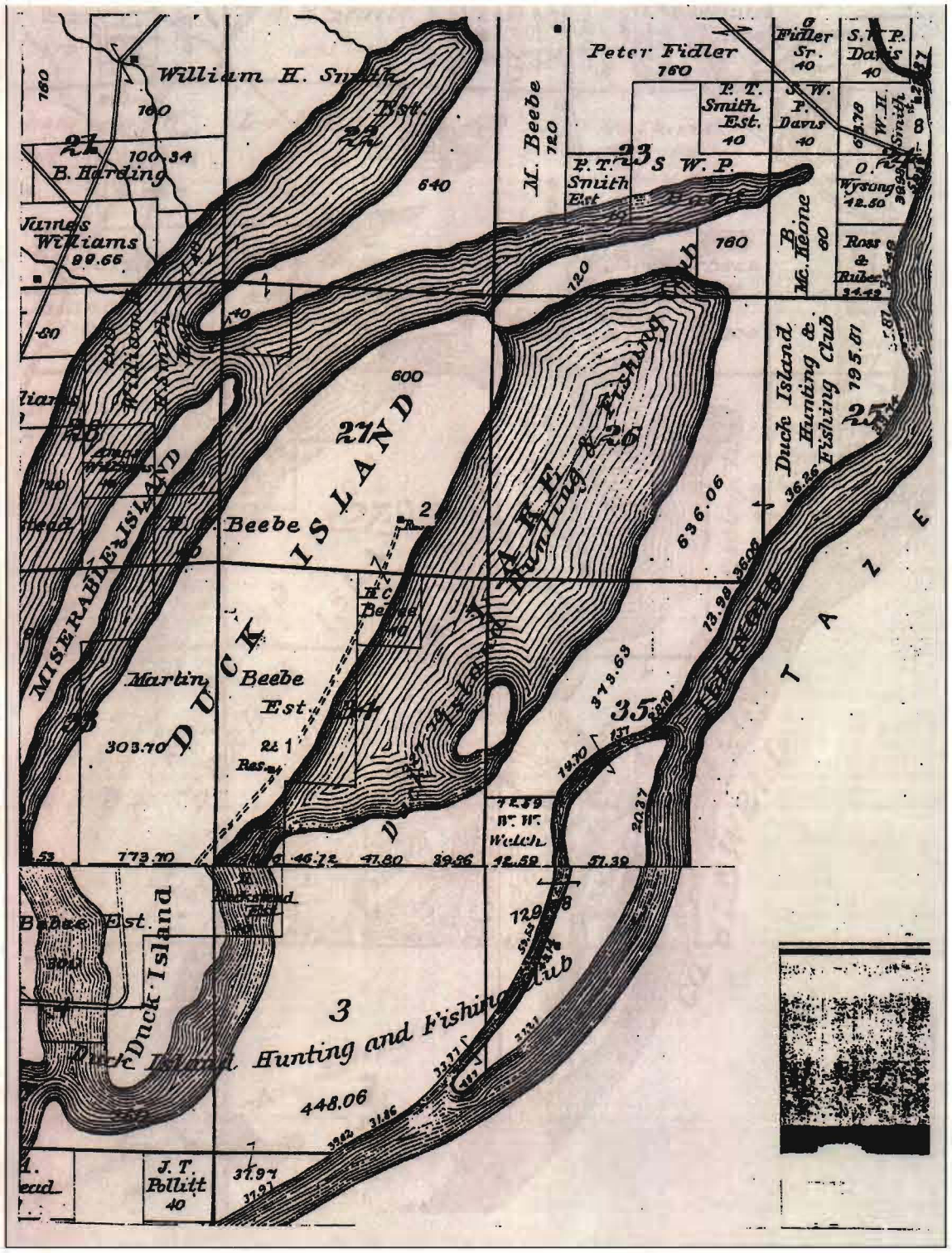


Figure C11. 1895 Project Area Map.

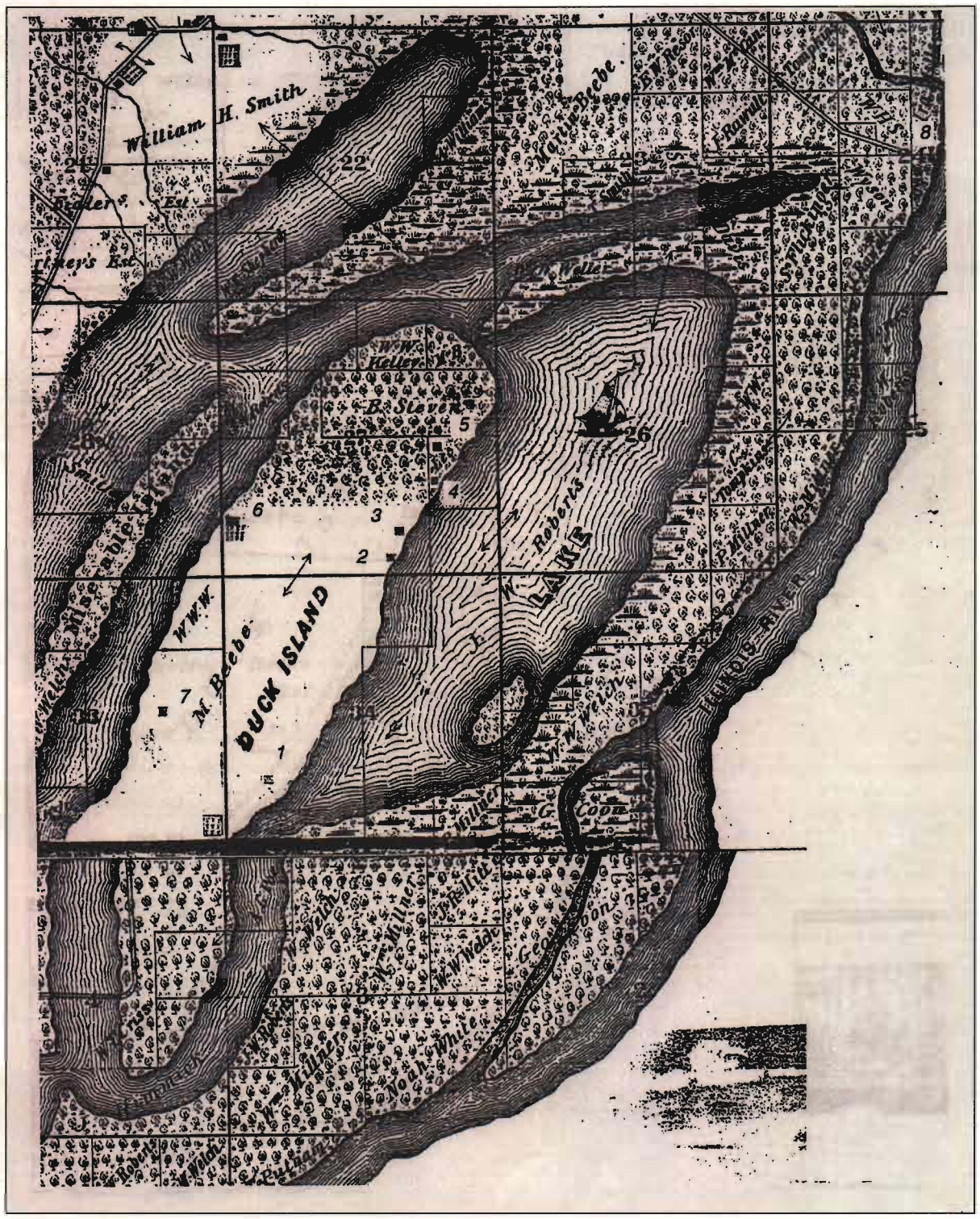


Figure C12. 1871 Project Area Map.

APPENDIX D
SITE RECONNAISSANCE PHOTOS
3-28-01

Photo D001. Duck Island Looking NW at Location of Proposed Fish Egress Structure.

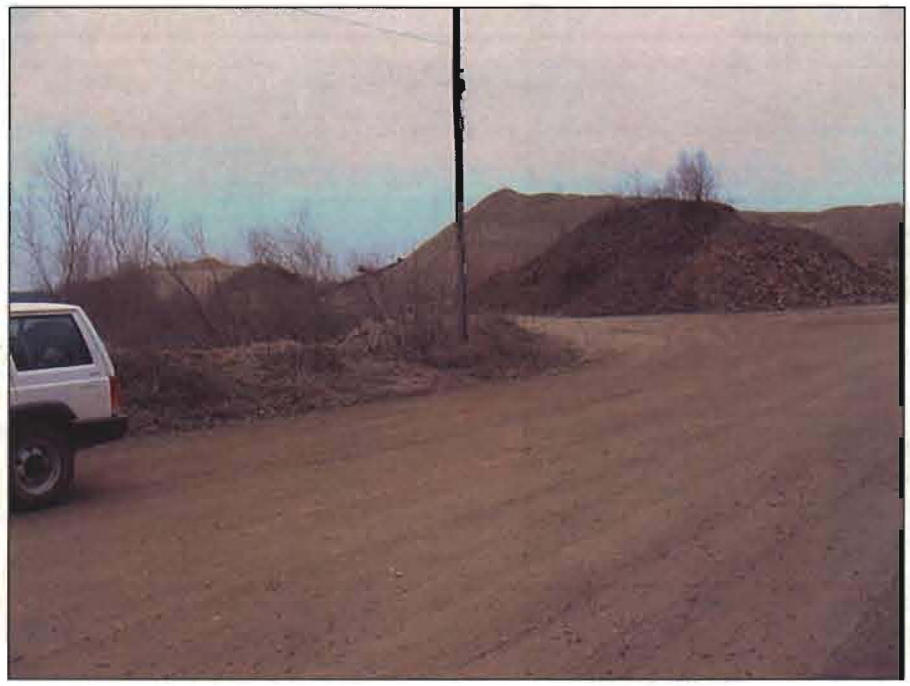


Photo D002. Gravel Quarry on Duck Island.

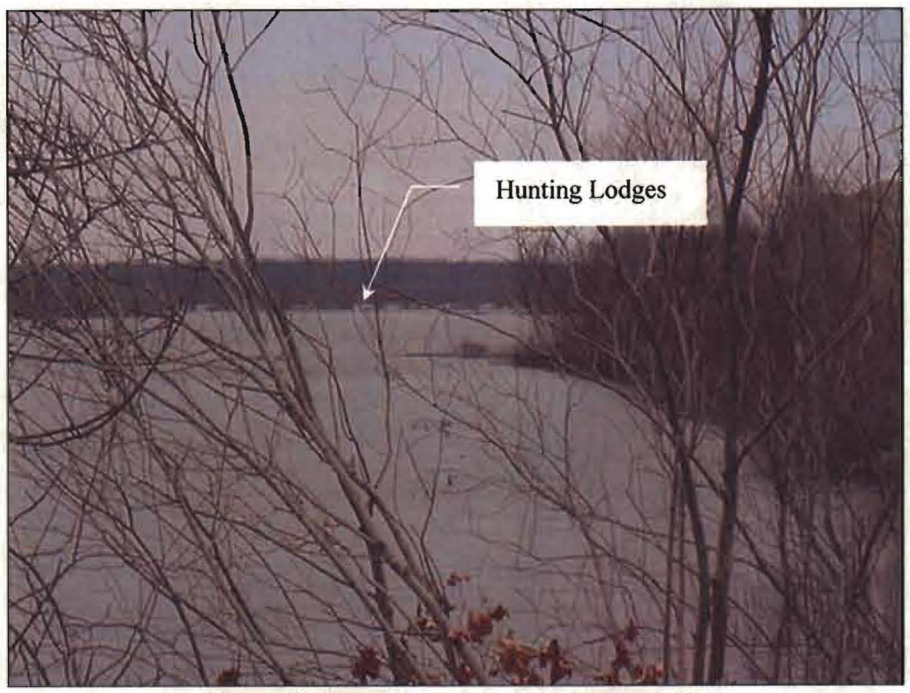


Photo D003. Duck Island Quarry Pit.

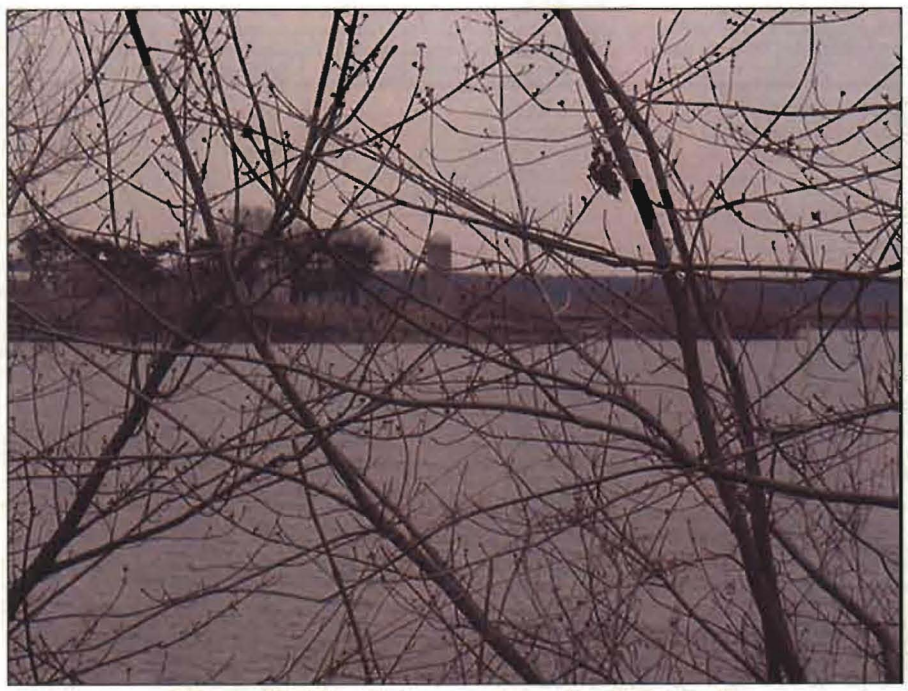


Photo D004. Homestead on Duck Island.

Photo D005. Narrows Dam-Earth Section.

Photo D006. Narrows Dam-Stop log Section.

Photo D007. Narrows Dam Abutment.

Photo D008. Existing Pump Station at Copperas Creek.

Photo D009. Backwaters of Big Lake near Voorhees Levee.

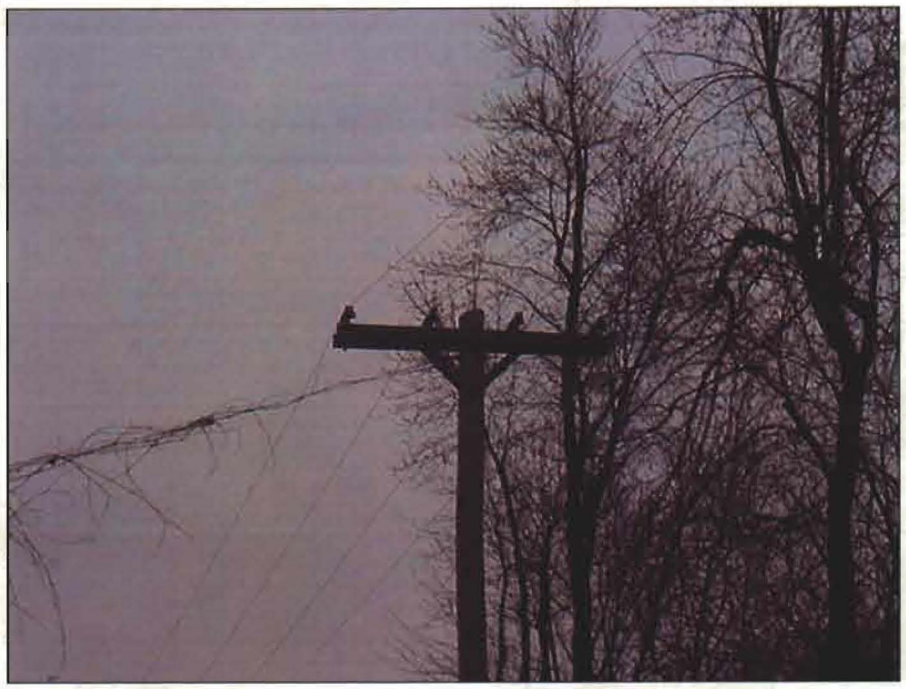


Photo D010. Power Transmission Lines to Public Use Area.

Photo D011. Remains of Copperas Creek Lock and Dam.

Photo D012. Remains of Copperas Creek Lock and Dam.

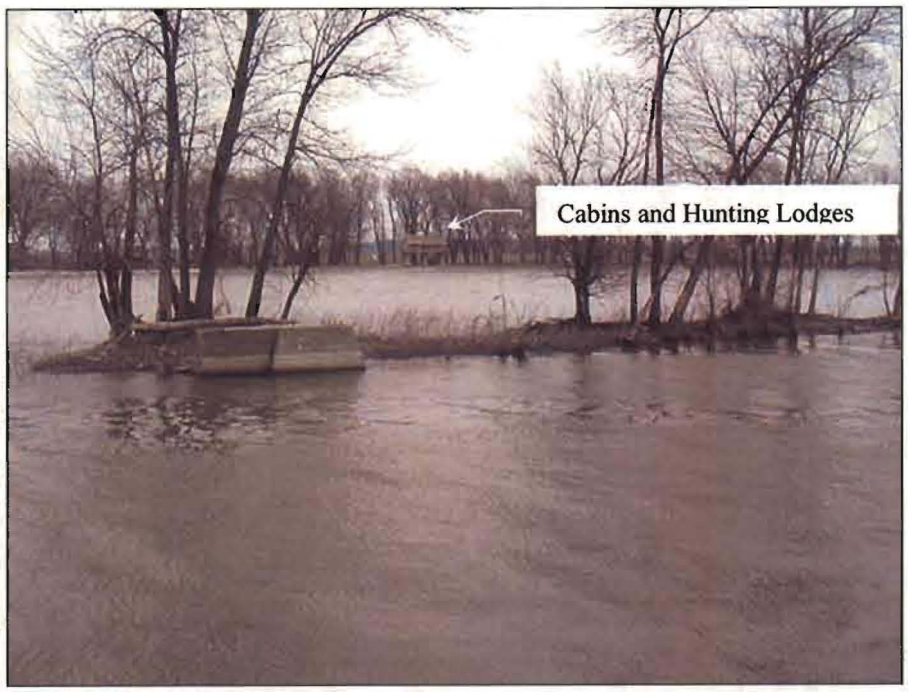


Photo D013. Remains of Copperas Creek Lock and Dam.

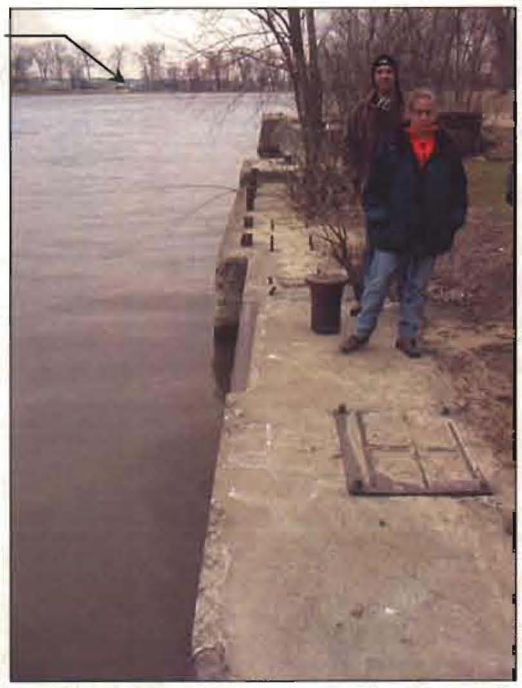


Photo D014. Remains of Copperas Creek Lock and Dam.

Photo D015. Remains of Copperas Creek Lock and Dam.

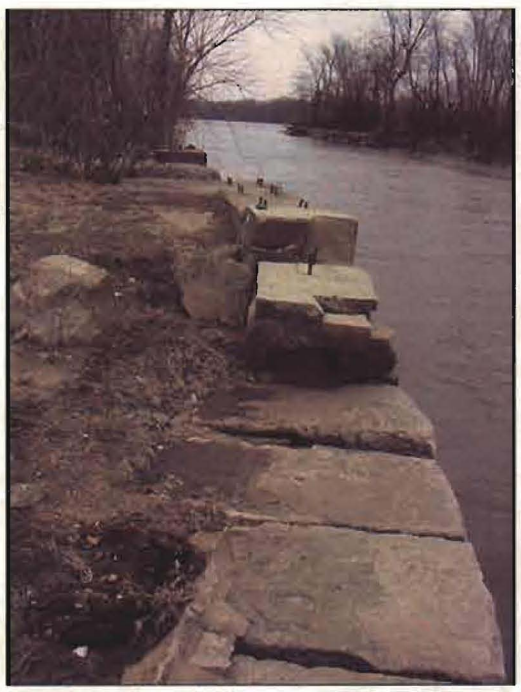


Photo D016. Remains of Copperas Creek Lock and Dam.

Photo D017. Public Boat Ramp Near Copperas Creek Lock and Dam. Private cabins on Duck Island Across River.

Photo D018. Road From Public Use Area to Lower Levee.

Photo D019. Backwater Area of Big Lake Near Public Use Area.

Photo D020. Backwater Area of Big Lake Near Public Use Area.

Photo D021. Backwater Area of Big Lake Near Public Use Area.

Photo D022. Single-phase 220 VAC Power Source for Public Use Area.

RICE LAKE SFWA HREP
PHASE I ESA

SITE RECONNAISSANCE PHOTOS
8-3-01

Photo D023. Hunting Lodge on North Road.

Photo D024. Remains of Copperas Creek Lock and Dam.

Photo D025. Aboveground Storage Tanks at Duck Creek Sand and Gravel.

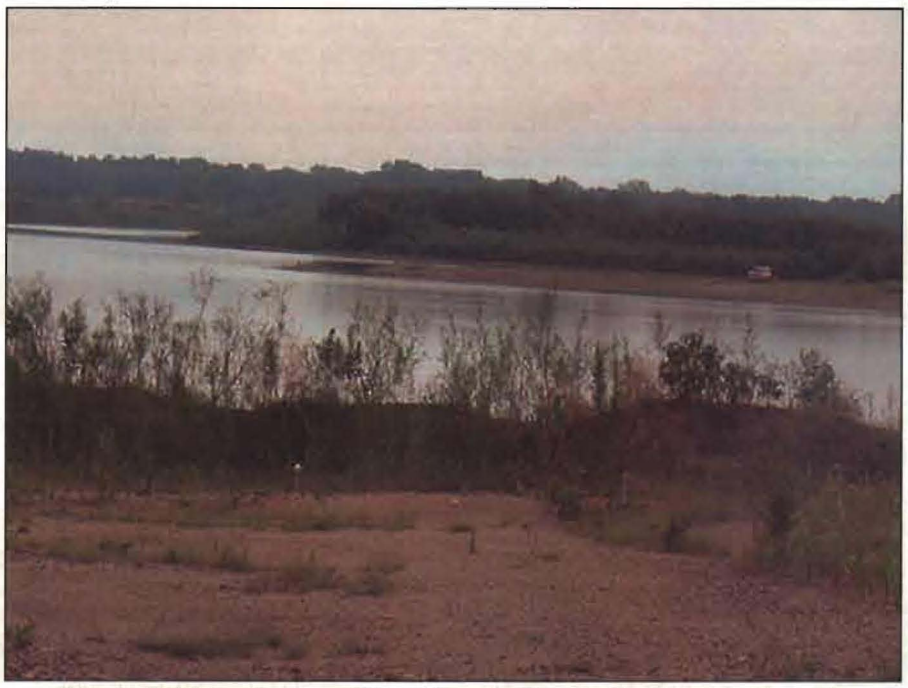


Photo D026. Quarry Pit at Duck Creek Sand and Gravel.

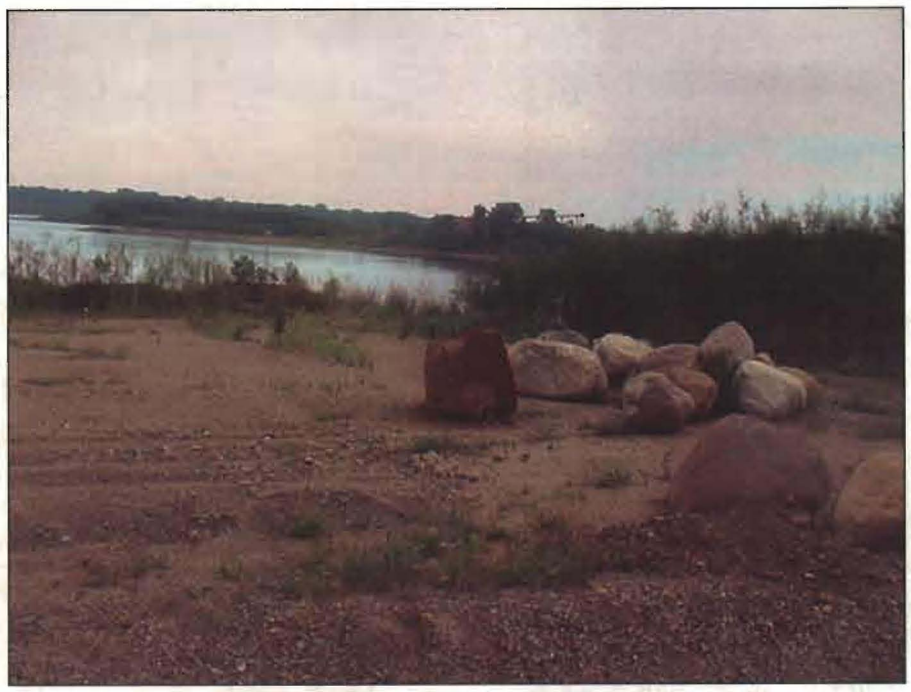


Photo D027. Quarry Equipment and Gravel Pit.

Photo D028. Homestead on Duck Island.

Photo D029. View of Power Plant from Duck Island.

Photo D030. Agricultural field. Looking North from the End of the Primary Quarry Area.

Photo D031. Quarry Overburden.

Photo D032. Quarry Overburden and Illinois River Looking East.

Photo D033. Aboveground Storage Tank.

Photo D034. "The Red Nose" Hunting Club.

Photo D035. Propane Tank Near Hunting Club.

Photo D036. "The Narrows" Concrete Structure.

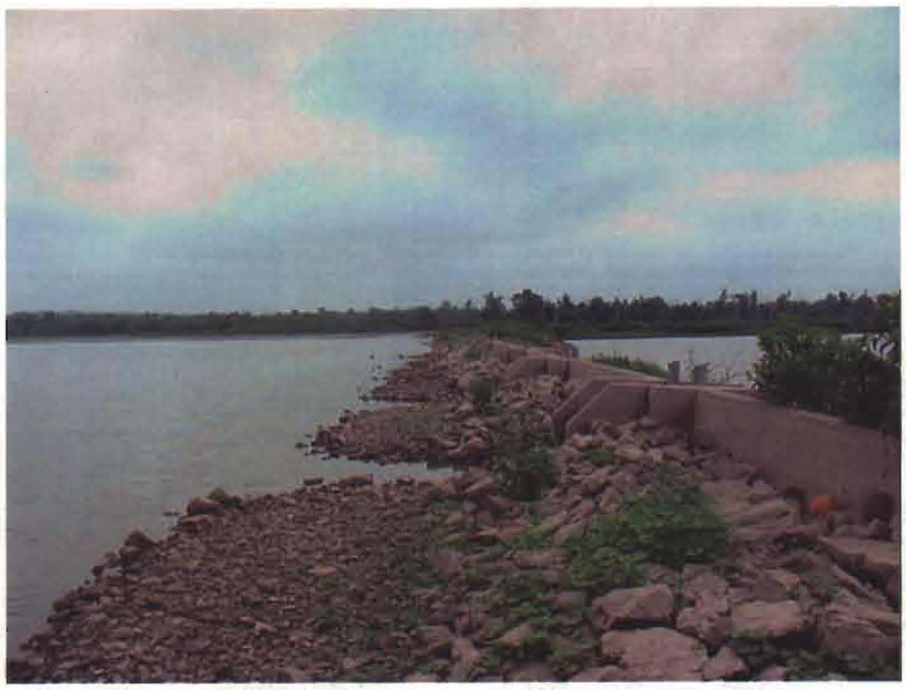


Photo D037. "The Narrows" Concrete Structure.

Photo D038. Typical Duck Blind.

Photo D039. Quarry Overburden.

Photo D040. Homestead and Quarry Overburden.

Photo D041. Wildlife on Duck Island.

Photo D042. Overburden and Pit on Duck Island.

Photo D043. Homestead on Duck Island.

Photo D044. Homestead on Duck Island.

Photo D045. No Trespassing Sign on Access Road to Power Plant.

Photo D046. Sign at Entrance of Access Road.

Photo D047. View of Power Plant from Nearby Public Access Road.

Photo D048. Power Lines Exiting Power Plant.

Photo D049. Typical Strip Mining Area. Note Exposed Clay Cuts.

Photo D050. Typical Strip Mining Area.

Photo D051. Strip Mining Overburden.

Photo D052. Voorhees Moist Soil Management Unit.

Photo D053. Pump for Voorhees Moist Soil Management Unit.

Photo D054. Inlet Structure from Pump Station.

Photo D055. Remains of Historic Restaurant.

Photo D056. Public Boat Ramp. Cabins across the Illinois River.

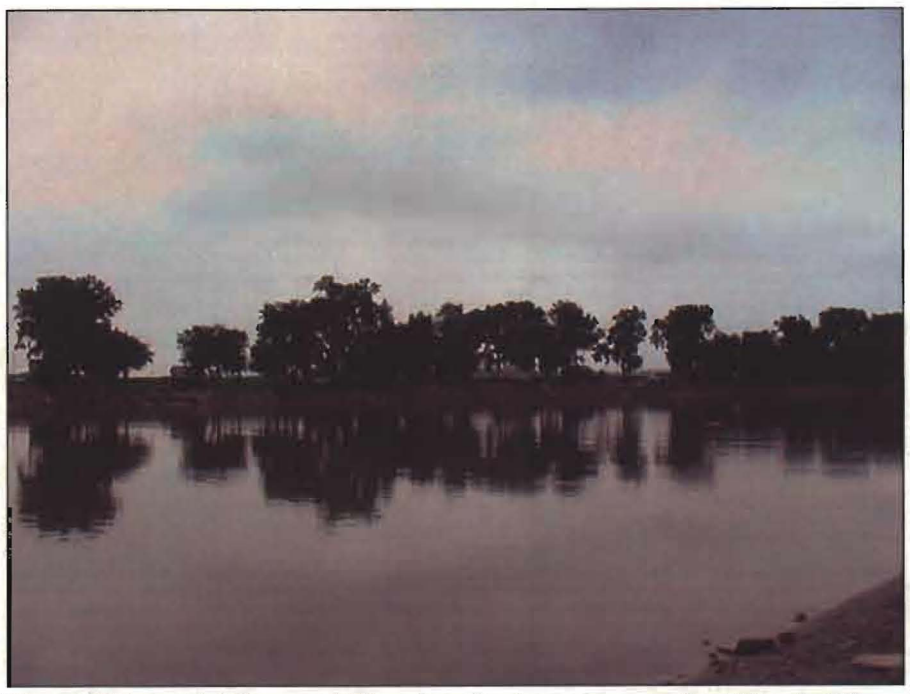


Photo D057. Cabins and Hunting Lodges Across the Illinois River.

Photo D058. Rusty 55-Gallon Drum.

Photo D059. Quarry Pit Area.

Photo D060. Abandoned Trailer.

Photo D061. Duck Creek Sand and Gravel Facilities.

Photo D062. Duck Creek Sand and Gravel Facilities.

Photo D063. Duck Creek Sand and Gravel Equipment. Note aboveground storage tank.

Photo D064. Duck Creek Sand and Gravel Facilities. Note aboveground storage tank.

Photo D065. Duck Creek Sand and Gravel Facilities.

APPENDIX E
LAND TITLE RECORDS

2055 East Rio Salado Parkway, Suite 201
Tempe, Arizona 85281
Phone: (480) 967-6752
Fax Number: (480) 966-9422
Web Site: www.netronline.com

HISTORICAL CHAIN OF TITLE REPORT

RICE LAKE PENINSULA
DUCK ISLAND PENINSULA
CANTON, ILLINOIS

Submitted to:

ENVIRONMENTAL DATA RESOURCES, INC.

C/O

US ARMY CORPS OF ENGINEERS
P.O. Box 2004, Clocktower Building #205 CEMVR-ED-DN
Rock Island, Illinois 61120
(309) 794-5439

Attention: Julie Fisher

Project No. N04-0580

Friday, April 23, 2004

NETR- Real Estate Research & Information hereby submits the following ASTM historical chain-of-title to the land described below, subject to the leases/miscellaneous shown in
Section 2. Title to the estate or interest covered by this report appears to be vested in:

THE PEOPLE OF THE STATE OF ILLINOIS, DEPARTMENT OF NATURAL RESOURCES

The following is the current property legal description:

All those certain pieces or parcels of land being Sections 4, and 5, Township 5 North, Range 5 East and Sections 27, 28, 33

and 34, Township 6 North, Range 5 East, lying and situate in the City of Canton, County of Fulton, State of Illinois.

1. HISTORICAL CHAIN OF TITLE

1. EXECUTOR'S DEED:
   - RECORDED: 12-31-1941
   - GRANTOR: Libbie F. Whitnah, Executor of the Last Will and Testament of Chester I. Whitnah, deceased
   - GRANTEE: Dorothea W. Barton and Mildred W. Montgomery
   - INSTRUMENT: 291492

2. WARRANTY DEED IN TRUST:
   - RECORDED: 12-17-1956
   - GRANTOR: Dorothea W. Barton and George F. Barton; and Mildred W. Montgomery and Munro Montgomery
   - GRANTEE: The Northern Trust Company of Chicago, Trustee
   - INSTRUMENT: 354590

3. TRUSTEE'S DEED:
   - RECORDED: 07-29-1968
   - GRANTOR: The Northern Trust Company, Trustee
   - GRANTEE: The First National Bank of Peoria, as Successor Trustee of the Northern Trust Company Trust No. 237408
   - INSTRUMENT: 68-10332

4. TRUSTEE'S DEED:
   - RECORDED: 05-03-2001
   - GRANTOR: Commerce Bank, N. A. of Peoria, formerly known as First National Bank of Peoria, as Successor Trustee the Mildor Trust No. 1
   - GRANTEE: Whitnah H. Barton, Trustee and Christine B. Gaynor (each as to ½ interest)
   - INSTRUMENT: 01-11992

5. WARRANTY DEED:
   - RECORDED: 11-14-2001
   - GRANTOR: Christine B. Gaynor (as to ½ interest)
   - GRANTEE: The People of the State of Illinois, Department of Natural Resources
   - INSTRUMENT: 01-16780

6. TRUSTEE'S DEED:

RECORDED: 11-14-2001
GRANTOR: Whitnah H. Barton, Trustee (as to ½ interest)
GRANTEE: The People of the State of Illinois, Department of Natural Resources
INSTRUMENT: 01-16781

2. LEASES AND MISCELLANEOUS

1. MEMORANDUM OF LEASE:
   RECORDED: 06-02-1986
   LESSOR: The First National Bank of Peoria, Trustee
   LESSEE: Duck Island Sand and Gravel Company
   INSTRUMENT: 86-16785

3. LIMITATION

This report was prepared for the use of Environmental Data Resources, Inc., and US Army Corps of Engineers, exclusively. This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. NETR- Real Estate Research & Information does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from the various agencies that make it available. The total liability is limited to the fee paid for this report.

APPENDIX F
REGULATORY RECORDS DOCUMENTATION

Rice Lake
US Hwy 24/IL 9
Canton, IL 61520

Inquiry Number: 2693636.2s
February 05, 2010

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

US HWY 24/IL 9
CANTON, IL 61520

COORDINATES

Latitude (North):	40.483300 - 40° 28' 59.9"
Longitude (West):	89.912100 - 89° 54' 43.6"
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	253161.9
UTM Y (Meters):	4485264.5
Elevation:	437 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	40089-D8 DUCK ISLAND, IL
Most Recent Revision:	1997

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

EXECUTIVE SUMMARY

Federal CERCLIS list

CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP..... CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG..... RCRA - Large Quantity Generators
RCRA-SQG..... RCRA - Small Quantity Generators
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROL..... Sites with Institutional Controls

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

CAT..... Category List

State- and tribal - equivalent CERCLIS

SHWS..... State Oversight List

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Available Disposal for Solid Waste in Illinois - Solid Waste Landfills Subject to State Surcharge
LF SPECIAL WASTE..... Special Waste Site List
IL NIPC..... Solid Waste Landfill Inventory

State and tribal leaking storage tank lists

LUST..... Leaking Underground Storage Tank Sites
LUST TRUST..... Underground Storage Tank Fund Payment Priority List
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST..... Underground Storage Tank Facility List

INDIAN UST..... Underground Storage Tanks on Indian Land
FEMA UST..... Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

ENG CONTROLS..... Sites with Engineering Controls
INST CONTROL..... Institutional Controls

State and tribal voluntary cleanup sites

SRP..... Site Remediation Program Database
INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Municipal Brownfields Redevelopment Grant Program Project Descriptions

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI..... Open Dump Inventory
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
LF SPECIAL WASTE..... Special Waste Site List
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL..... Clandestine Drug Labs
CDL..... Meth Drug Lab Site Listing
US HIST CDL..... National Clandestine Laboratory Register

Local Land Records

LIENS 2..... CERCLA Lien Information
LUCIS..... Land Use Control Information System

Records of Emergency Release Reports

HMIRS..... Hazardous Materials Information Reporting System
SPILLS..... State spills

Other Ascertainable Records

RCRA-NonGen..... RCRA - Non Generators
DOT OPS..... Incident and Accident Data
DOD..... Department of Defense Sites
FUDS..... Formerly Used Defense Sites
CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision

UMTRA	Uranium Mill Tailings Sites
MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
UIC	Underground Injection Wells
NPDES	A Listing of Active Permits
DRYCLEANERS	Illinois Licensed Drycleaners
IMPDMENT	Surface Impoundment Inventory
AIRS	AIRS
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
COAL ASH DOE	Sleam-Electric Plan Operation Data

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

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

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
GROFF, R KILROY	SWF/LF
KINSEL CH	SWF/LF
GORDY'S GET "N" GO	UST
RICE LAKE STATE FISH & WILDLIFE	UST
WHYDE'S HAUS	UST
78 RT 4	RCRA-SQG, FINDS
CUSTOM POWER PRODUCTS INC	RCRA-SQG, FINDS
RT 24	RCRA-NonGen, FINDS
E 20516 HWY	RCRA-CESQG, FINDS
NEW CIE OPCO LLC	RCRA-CESQG
DUCK CREEK SAND & GRAVEL, INC.	MINES

OVERVIEW MAP - 2693636.2s

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

0 1/4 1/2 1 Miles

- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines
- National Wetland Inventory

SITE NAME:	Rice Lake	CLIENT:	U.S. Army Corp. of Eng. Rock
ADDRESS:	US Hwy 24/IL 9 Canton IL 61520	CONTACT:	Steve Gustafson
LAT/LONG:	40.4833 / 89.9121	INQUIRY #:	2693636.2s
		DATE:	February 05, 2010 5:46 pm

DETAIL MAP - 2693636.2s

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Oil & Gas pipelines
- National Wetland Inventory

SITE NAME:	Rice Lake	CLIENT:	U.S. Army Corp. of Eng. Rock
ADDRESS:	US Hwy 24/IL 9 Canton IL 61520	CONTACT:	Steve Gustafson
LAT/LONG:	40.4833 / 89.9121	INQUIRY #:	2693636.2s
		DATE:	February 05, 2010 5:46 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
NPL LIENS		TP	NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL		1.000	0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS		0.500	0	0	0	NR	NR	0
FEDERAL FACILITY		1.000	0	0	0	0	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP		0.500	0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS		1.000	0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF		0.500	0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG		0.250	0	0	NR	NR	NR	0
RCRA-SQG		0.250	0	0	NR	NR	NR	0
RCRA-CESQG		0.250	0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
Federal ERNS list								
ERNS		TP	NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
CAT		1.000	0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
SHWS		1.000	0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF		0.500	0	0	0	NR	NR	0
LF SPECIAL WASTE		0.500	0	0	0	NR	NR	0
IL NIPC		0.500	0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST		0.500	0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LUST TRUST		0.500	0	0	0	NR	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST		0.250	0	0	NR	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
FEMA UST		0.250	0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS		0.500	0	0	0	NR	NR	0
INST CONTROL		0.500	0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
SRP		0.500	0	0	0	NR	NR	0
INDIAN VCP		0.500	0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS		0.500	0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
ODI		0.500	0	0	0	NR	NR	0
DEBRIS REGION 9		0.500	0	0	0	NR	NR	0
LF SPECIAL WASTE		0.500	0	0	0	NR	NR	0
INDIAN ODI		0.500	0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL		TP	NR	NR	NR	NR	NR	0
CDL		TP	NR	NR	NR	NR	NR	0
US HIST CDL		TP	NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2		TP	NR	NR	NR	NR	NR	0
LUCIS		0.500	0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS		TP	NR	NR	NR	NR	NR	0
SPILLS		TP	NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA-NonGen		0.250	0	0	NR	NR	NR	0
DOT OPS		TP	NR	NR	NR	NR	NR	0
DOD		1.000	0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FUDS		1.000	0	0	0	0	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
HIST FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
RADINFO		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
UIC		TP	NR	NR	NR	NR	NR	0
NPDES		TP	NR	NR	NR	NR	NR	0
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
IMPDMENT		0.500	0	0	0	NR	NR	0
AIRS		TP	NR	NR	NR	NR	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
SCRD DRYCLEANERS		0.500	0	0	0	NR	NR	0
PCB TRANSFORMER		TP	NR	NR	NR	NR	NR	0
COAL ASH EPA		0.500	0	0	0	NR	NR	0
COAL ASH DOE		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
EDR Proprietary Records								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

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

NO SITES FOUND

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BANNER	1000824507		RT 24	61520	RCRA-NonGen, FINDS
BANNER	U003104901	GORDY'S GET "N" GO	215 UNITED STATES ROUTE 24	61520	UST
CANTON	1004696326		E 20516 HWY	61520	RCRA-CESQG, FINDS
CANTON	U000162822	RICE LAKE STATE FISH & WILDLIFE	RR 3	61520	UST
CANTON	1001116319		78 RT 4	61520	RCRA-SQG, FINDS
CANTON	S108111597	GROFF, R KILROY	RR 5	61520	SWF/LF
CANTON	U001135879	WHYDE'S HAUS	78 RT 5 S	61520	UST
CANTON	1012178492	NEW CIE OPCO LLC	23133 E RTE 6	61520	RCRA-CESQG
CANTON	S108112027	KINSEL CH	STREET	61520	SWF/LF
EDELSTEIN	1000703770	CUSTOM POWER PRODUCTS INC	RT 88 N	61520	RCRA-SQG, FINDS
FULTON COUNTY	M300003579	DUCK CREEK SAND & GRAVEL, INC.	DUCK CREEK SAND & GRAVEL PIT		MINES

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 11/01/2009
Date Data Arrived at EDR: 11/13/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 59

Source: EPA
Telephone: N/A
Last EDR Contact: 01/14/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites
A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 11/01/2009
Date Data Arrived at EDR: 11/13/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 59

Source: EPA
Telephone: N/A
Last EDR Contact: 01/14/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens
Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/17/2009
Next Scheduled EDR Contact: 11/16/2009
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 11/01/2009
Date Data Arrived at EDR: 11/13/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 59

Source: EPA
Telephone: N/A
Last EDR Contact: 01/14/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 06/30/2009
Date Data Arrived at EDR: 08/11/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 41

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 12/28/2009
Next Scheduled EDR Contact: 04/12/2010
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of NPL and Base Realighnment & Closure sites found in the CERCLIS database where FERRO is involved in cleanup projects.

Date of Government Version: 10/03/2008
Date Data Arrived at EDR: 07/10/2009
Date Made Active in Reports: 09/29/2009
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 06/23/2009
Date Data Arrived at EDR: 09/02/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 19

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/24/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/15/2009
Date Data Arrived at EDR: 09/22/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 48

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/16/2009
Next Scheduled EDR Contact: 03/01/2010
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/11/2009
Date Data Arrived at EDR: 12/17/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/11/2009
Date Data Arrived at EDR: 12/17/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/11/2009
Date Data Arrived at EDR: 12/17/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/11/2009
Date Data Arrived at EDR: 12/17/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 10/01/2009
Date Data Arrived at EDR: 10/09/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 10/01/2009
Date Data Arrived at EDR: 10/09/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 08/31/2009
Date Data Arrived at EDR: 09/17/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 53

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Annually

State- and tribal - equivalent NPL

CAT: Category List

Sites on this list are: Notice of Response Action, NPL, Pre/proposed NPL, Completed Remedial Action, Site Remediation Program, Federal Facilities, and Cleanup Started and/or Completed Sites.

Date of Government Version: 06/01/1997
Date Data Arrived at EDR: 07/07/1997
Date Made Active in Reports: 08/14/1997
Number of Days to Update: 38

Source: Illinois EPA
Telephone: N/A
Last EDR Contact: 02/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

State- and tribal - equivalent CERCLIS

SHWS: State Oversight List

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 11/16/2009
Date Data Arrived at EDR: 11/25/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 47

Source: Illinois Environmental Protection Agency
Telephone: 217-524-4863
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Available Disposal for Solid Waste in Illinois - Solid Waste Landfills Subject to State Surcharge
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/01/2007
Date Data Arrived at EDR: 04/18/2008
Date Made Active in Reports: 04/30/2008
Number of Days to Update: 12

Source: Illinois Environmental Protection Agency
Telephone: 217-785-8604
Last EDR Contact: 02/03/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Annually

LF WMRC: Waste Management & Research Center Landfill Database
The Waste Management & Research Center Landfill Database includes records from the Department of Public Health, Department of Mines & Minerals, Illinois Environmental Protection Agency, State Geological Survey, Northeastern Illinois Planning Commission and Pollution Control Board.

Date of Government Version: 12/31/2001
Date Data Arrived at EDR: 10/06/2006
Date Made Active in Reports: 11/06/2006
Number of Days to Update: 31

Source: Department of Natural Resources
Telephone: 217-333-8940
Last EDR Contact: 09/18/2009
Next Scheduled EDR Contact: 12/28/2009
Data Release Frequency: No Update Planned

LF SPECIAL WASTE: Special Waste Site List
These landfills, as of January 1, 1990, accept non-hazardous special waste pursuant to the Illinois EPA Non-Hazardous Special Waste Definition. List A includes landfills that may receive any non-hazardous waste, Non-Regional Pollution Control Facilities are so noted. List B includes landfills designed to receive specific non-hazardous wastes. List B landfills are designated as a Regional Pollution Control Facility by RPCF, or Non-Regional Pollution Control Facility by Non-RPCF.

Date of Government Version: 01/01/1990
Date Data Arrived at EDR: 06/17/2009
Date Made Active in Reports: 07/15/2009
Number of Days to Update: 28

Source: Illinois EPA
Telephone: 217-782-9288
Last EDR Contact: 06/10/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IL NIPC: Solid Waste Landfill Inventory
Solid Waste Landfill Inventory. NIPC is an inventory of active and inactive solid waste disposal sites, based on state, local government and historical archive data. Included are numerous sites which previously had never been identified largely because there was no obligation to register such sites prior to 1971.

Date of Government Version: 08/01/1988
Date Data Arrived at EDR: 08/01/1994
Date Made Active in Reports: 08/12/1994
Number of Days to Update: 11

Source: Northeastern Illinois Planning Commission
Telephone: 312-454-0400
Last EDR Contact: 05/23/2006
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Sites
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 12/11/2009
Date Data Arrived at EDR: 12/11/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 31

Source: Illinois Environmental Protection Agency
Telephone: 217-782-6762
Last EDR Contact: 02/02/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST TRUST: Underground Storage Tank Fund Payment Prioirty List
In case sufficient funds are not available in the Underground Storage Tank Fund, requests for payment are entered on the Payment Priority List by "queue date" order. As required by the Environmental Protection Act, the queue date is the date that a complete request for partial or final payment was received by the Agency. The queue date is "officially" confirmed at the end of the payment review process when a Final Decision Letter is sent to the site owner.

Date of Government Version: 11/03/2009
Date Data Arrived at EDR: 11/03/2009
Date Made Active in Reports: 11/13/2009
Number of Days to Update: 10

Source: Illinois EPA
Telephone: 217-782-6762
Last EDR Contact: 02/02/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 15

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 03/24/2009
Date Data Arrived at EDR: 05/20/2009
Date Made Active in Reports: 06/17/2009
Number of Days to Update: 28

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 11/12/2009
Date Data Arrived at EDR: 11/12/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/19/2009
Date Data Arrived at EDR: 02/19/2009
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 25

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/10/2009
Date Data Arrived at EDR: 11/12/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 34

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 11/24/2009
Date Data Arrived at EDR: 11/25/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/07/2009
Date Data Arrived at EDR: 12/09/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 7

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Semi-Annually

State and tribal registered storage tank lists

UST: Underground Storage Tank Facility List
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/03/2009
Date Data Arrived at EDR: 11/03/2009
Date Made Active in Reports: 11/19/2009
Number of Days to Update: 16

Source: Illinois State Fire Marshal
Telephone: 217-785-0969
Last EDR Contact: 02/02/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/10/2009
Date Data Arrived at EDR: 11/12/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 34

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 02/17/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/01/2008
Date Data Arrived at EDR: 12/30/2008
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 76

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/07/2009
Date Data Arrived at EDR: 12/09/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 7

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 11/12/2009
Date Data Arrived at EDR: 11/20/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 26

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/19/2009
Date Data Arrived at EDR: 02/19/2009
Date Made Active in Reports: 03/16/2009
Number of Days to Update: 25

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 15

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 11/12/2009
Date Data Arrived at EDR: 11/12/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2009
Date Data Arrived at EDR: 11/05/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 41

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 10/01/2009
Date Data Arrived at EDR: 10/29/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 48

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/18/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENG CONTROLS: Sites with Engineering Controls
Sites using of engineered barriers (e.g., asphalt or concrete paving).

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 10/28/2009
Date Made Active in Reports: 11/13/2009
Number of Days to Update: 16

Source: Illinois Environmental Protection Agency
Telephone: 217-782-6761
Last EDR Contact: 01/28/2010
Next Scheduled EDR Contact: 05/10/2010
Data Release Frequency: Quarterly

Inst Control: Institutional Controls
Legal or administrative restrictions on land use and/or other activities (e.g., groundwater use restrictions) which effectively limit exposure to contamination may be employed as alternatives to removal or treatment of contamination.

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 10/28/2009
Date Made Active in Reports: 11/13/2009
Number of Days to Update: 16

Source: Illinois Environmental Protection Agency
Telephone: 217-782-6761
Last EDR Contact: 01/28/2010
Next Scheduled EDR Contact: 05/10/2010
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

SRP: Site Remediation Program Database
The database identifies the status of all voluntary remediation projects administered through the pre-notice site cleanup program (1989 to 1995) and the site remediation program (1996 to the present).

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 10/28/2009
Date Made Active in Reports: 11/13/2009
Number of Days to Update: 16

Source: Illinois Environmental Protection Agency
Telephone: 217-785-9407
Last EDR Contact: 01/28/2010
Next Scheduled EDR Contact: 05/10/2010
Data Release Frequency: Semi-Annually

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 04/02/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/05/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Municipal Brownfields Redevelopment Grant Program Project Descriptions
The Illinois Municipal Brownfields Redevelopment Grant Program (MBRGP) offers grants worth a maximum of $240,000 each to municipalities to assist in site investigation activities, development of cleanup objectives, and performance of cleanup activities. Brownfields are abandoned or underused industrial and/or commercial properties that are contaminated (or thought to be contaminated) and have an active potential for redevelopment.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 41

Source: Illinois Environmental Protection Agency
Telephone: 217-785-3486
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

BROWNFIELDS: Redevelopment Assessment Database

The Office of Site Evaluations Redevelopment Assessment database identifies the status of all properties within the State in which the Illinois EPA's Office of Site Evaluation has conducted a municipal Brownfield Redevelopment Assessment.

Date of Government Version: 11/03/2009
Date Data Arrived at EDR: 11/03/2009
Date Made Active in Reports: 11/13/2009
Number of Days to Update: 10

Source: Illinois Environmental Protection Agency
Telephone: 217-524-1658
Last EDR Contact: 02/02/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 10/01/2009
Date Data Arrived at EDR: 11/04/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 01/07/2010
Next Scheduled EDR Contact: 04/12/2010
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-972-3336
Last EDR Contact: 01/07/2010
Next Scheduled EDR Contact: 03/22/2010
Data Release Frequency: Varies

LF SPECIAL WASTE: Special Waste Site List

These landfills, as of January 1, 1990, accept non-hazardous special waste pursuant to the Illinois EPA Non-Hazardous Special Waste Definition. List A includes landfills that may receive any non-hazardous waste, Non-Regional Pollution Control Facilities are so noted. List B includes landfills designed to receive specific non-hazardous wastes. List B landfills are designated as a Regional Pollution Control Facility by RPCF, or Non-Regional Pollution Control Facility by Non-RPCF.

Date of Government Version: 01/01/1990
Date Data Arrived at EDR: 06/17/2009
Date Made Active in Reports: 07/15/2009
Number of Days to Update: 28

Source: Illinois EPA
Telephone: 217-782-9288
Last EDR Contact: 06/10/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/09/2009
Next Scheduled EDR Contact: 02/22/2010
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 03/01/2009
Date Data Arrived at EDR: 06/22/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 91

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 12/14/2009
Next Scheduled EDR Contact: 03/22/2010
Data Release Frequency: Quarterly

CDL: Meth Drug Lab Site Listing
A listing of clandestine/meth drug lab locations.

Date of Government Version: 01/20/2010
Date Data Arrived at EDR: 01/21/2010
Date Made Active in Reports: 01/26/2010
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 217-782-5750
Last EDR Contact: 01/18/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 11/03/2009
Date Data Arrived at EDR: 11/05/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 41

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Varies

LUCIS: Land Use Control Information System
LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/20/2009
Next Scheduled EDR Contact: 03/08/2010
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 10/05/2009
Date Data Arrived at EDR: 10/05/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 35

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/06/2010
Next Scheduled EDR Contact: 04/12/2010
Data Release Frequency: Annually

SPILLS: State spills
A listing of incidents reported to the Office of Emergency Response.

Date of Government Version: 10/19/2009
Date Data Arrived at EDR: 10/27/2009
Date Made Active in Reports: 11/13/2009
Number of Days to Update: 17

Source: Illinois EPA
Telephone: 217-558-1677
Last EDR Contact: 01/18/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Varies

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/11/2009
Date Data Arrived at EDR: 12/17/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/15/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 10/13/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 36

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/10/2009
Next Scheduled EDR Contact: 02/22/2010
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 01/19/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 09/30/2009
Date Made Active in Reports: 12/01/2009
Number of Days to Update: 62

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/18/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 08/03/2009
Date Data Arrived at EDR: 10/27/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 13

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/05/2010
Next Scheduled EDR Contact: 04/19/2010
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/15/2009
Date Made Active in Reports: 01/19/2010
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/15/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 01/05/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 05/08/2009
Number of Days to Update: 1

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 12/23/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/17/2009
Date Data Arrived at EDR: 12/08/2009
Date Made Active in Reports: 01/19/2010
Number of Days to Update: 42

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/08/2009
Next Scheduled EDR Contact: 03/22/2010
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 04/09/2009
Date Made Active in Reports: 06/17/2009
Number of Days to Update: 69

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 01/13/2010
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 01/20/2010
Next Scheduled EDR Contact: 04/12/2010
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 12/14/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 12/14/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 05/19/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 125

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 02/01/2010
Next Scheduled EDR Contact: 05/17/2010
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/10/2009
Date Data Arrived at EDR: 11/18/2009
Date Made Active in Reports: 01/19/2010
Number of Days to Update: 62

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 12/23/2009
Next Scheduled EDR Contact: 04/12/2010
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 09/01/2009
Date Data Arrived at EDR: 10/21/2009
Date Made Active in Reports: 12/01/2009
Number of Days to Update: 41

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/22/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 09/25/2009
Date Data Arrived at EDR: 10/23/2009
Date Made Active in Reports: 12/16/2009
Number of Days to Update: 54

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/14/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/15/2009
Date Data Arrived at EDR: 10/16/2009
Date Made Active in Reports: 12/01/2009
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/13/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/19/2009
Date Data Arrived at EDR: 10/22/2009
Date Made Active in Reports: 12/01/2009
Number of Days to Update: 40

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 12/10/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 02/19/2009
Date Made Active in Reports: 05/22/2009
Number of Days to Update: 92

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/20/2009
Next Scheduled EDR Contact: 03/05/2010
Data Release Frequency: Biennially

NPDES: A Listing of Active Permits

A listing of facilities currently active in the state. The types of permits are public, private, federal and state.

Date of Government Version: 01/15/2010
Date Data Arrived at EDR: 01/15/2010
Date Made Active in Reports: 01/26/2010
Number of Days to Update: 11

Source: Illinois EPA
Telephone: 217-782-0610
Last EDR Contact: 01/11/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Varies

UIC: Underground Injection Wells

Injection wells are used for disposal of fluids by "injection" into the subsurface. The construction of injection wells range from very technical designs with twenty-four hour monitoring to simply a hole dug in the ground to control runoff. As a result of this diversity, the UIC Program divides injection wells into five different classes.

Date of Government Version: 12/10/2009
Date Data Arrived at EDR: 12/16/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 26

Source: Illinois EPA
Telephone: 217-782-9878
Last EDR Contact: 11/30/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Varies

DRYCLEANERS: Illinois Licensed Drycleaners

Any retail drycleaning facility in Illinois must apply for a license through the Illinois Drycleaner Environmental Response Trust Fund. Drycleaner Environmental Response Trust Fund of Illinois.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/02/2009
Date Made Active in Reports: 01/11/2010
Number of Days to Update: 40

Source: Drycleaner Environmental Response Trust Fund of Illinois
Telephone: 800-765-4041
Last EDR Contact: 12/01/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Varies

IMPDMENT: Surface Impoundment Inventory

Statewide inventory of industrial, municipal, mining, oil & gas , and large agricultural impoundment. This study was conducted by the Illinois EPA to assess potentail for contamination of shallow aquifers. This was a one-time study. Although many of the impoundments may no longer be present, the sites may be contaminated.

Date of Government Version: 12/31/1980
Date Data Arrived at EDR: 03/08/2002
Date Made Active in Reports: 06/03/2002
Number of Days to Update: 87

Source: Illinois Waste Management & Research Center
Telephone: 217-333-8940
Last EDR Contact: 02/20/2002
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

AIRS: AIRS

A listing of air permits and emissions information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 02/12/2009
Date Made Active in Reports: 02/27/2009
Number of Days to Update: 15

Source: Illinois EPA
Telephone: 217-557-0314
Last EDR Contact: 01/11/2010
Next Scheduled EDR Contact: 04/26/2010
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/19/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 11/16/2009
Date Data Arrived at EDR: 11/16/2009
Date Made Active in Reports: 01/19/2010
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/25/2010
Next Scheduled EDR Contact: 05/10/2010
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/19/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/27/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 09/21/2009
Date Data Arrived at EDR: 09/25/2009
Date Made Active in Reports: 11/09/2009
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/15/2009
Next Scheduled EDR Contact: 03/29/2010
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 01/01/2008
Date Data Arrived at EDR: 02/18/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 100

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/13/2009
Next Scheduled EDR Contact: 02/15/2010
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 08/26/2009
Date Made Active in Reports: 09/11/2009
Number of Days to Update: 16

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/24/2009
Next Scheduled EDR Contact: 03/08/2010
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 01/20/2010
Date Made Active in Reports: 02/05/2010
Number of Days to Update: 16

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/20/2010
Next Scheduled EDR Contact: 05/03/2010
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 10/27/2009
Date Data Arrived at EDR: 11/10/2009
Date Made Active in Reports: 12/09/2009
Number of Days to Update: 29

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/10/2009
Next Scheduled EDR Contact: 02/22/2010
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 12/14/2009
Number of Days to Update: 13

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 11/23/2009
Next Scheduled EDR Contact: 03/08/2010
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 06/01/2009
Date Data Arrived at EDR: 06/12/2009
Date Made Active in Reports: 06/29/2009
Number of Days to Update: 17

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/30/2009
Next Scheduled EDR Contact: 03/15/2010
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 07/17/2009
Date Made Active in Reports: 08/10/2009
Number of Days to Update: 24

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/21/2009
Next Scheduled EDR Contact: 04/05/2010
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Homes & Centers Listing
Source: Department of Children & Family Services
Telephone: 312-814-4150

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2009 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

RICE LAKE
US HWY 24/IL 9
CANTON, IL 61520

TARGET PROPERTY COORDINATES

Latitude (North):	40.48330 - 40° 28' 59.9"
Longitude (West):	89.9121 - 89° 54' 43.6"
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	253161.9
UTM Y (Meters):	4485264.5
Elevation:	437 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	40089-D8 DUCK ISLAND, IL
Most Recent Revision:	1997

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

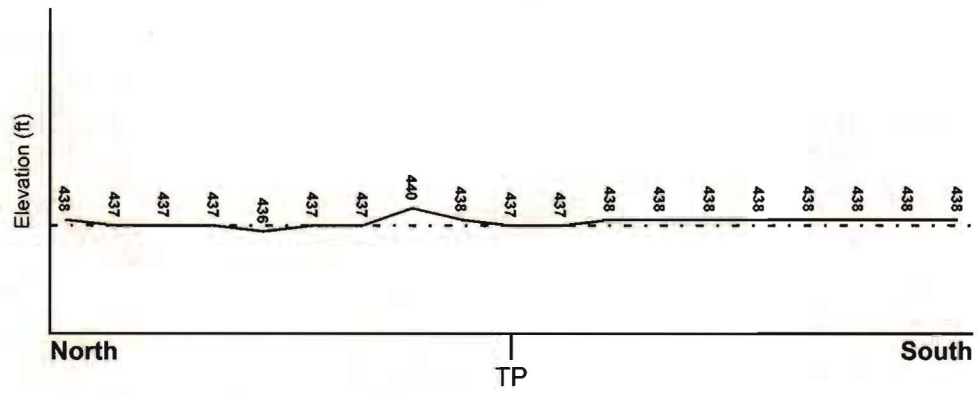
TOPOGRAPHIC INFORMATION

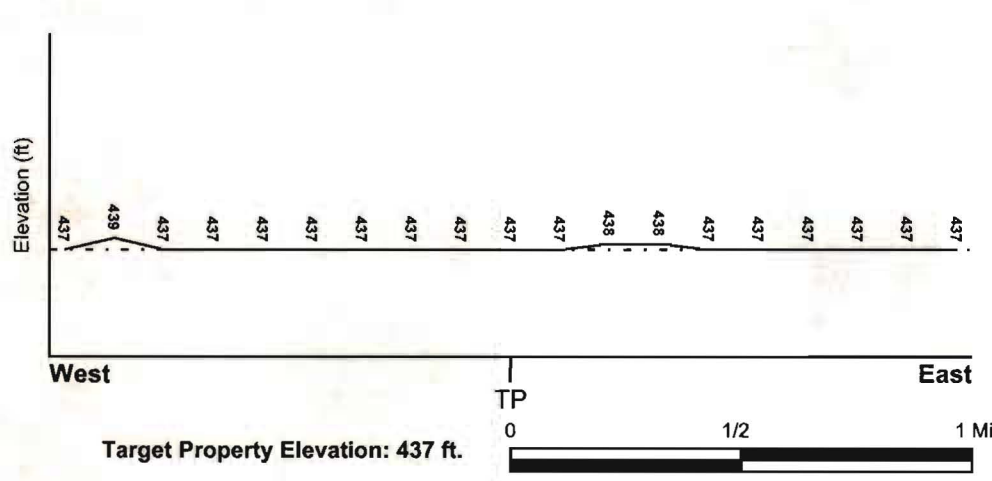
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General South

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
FULTON, IL	Not Available

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
DUCK ISLAND	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

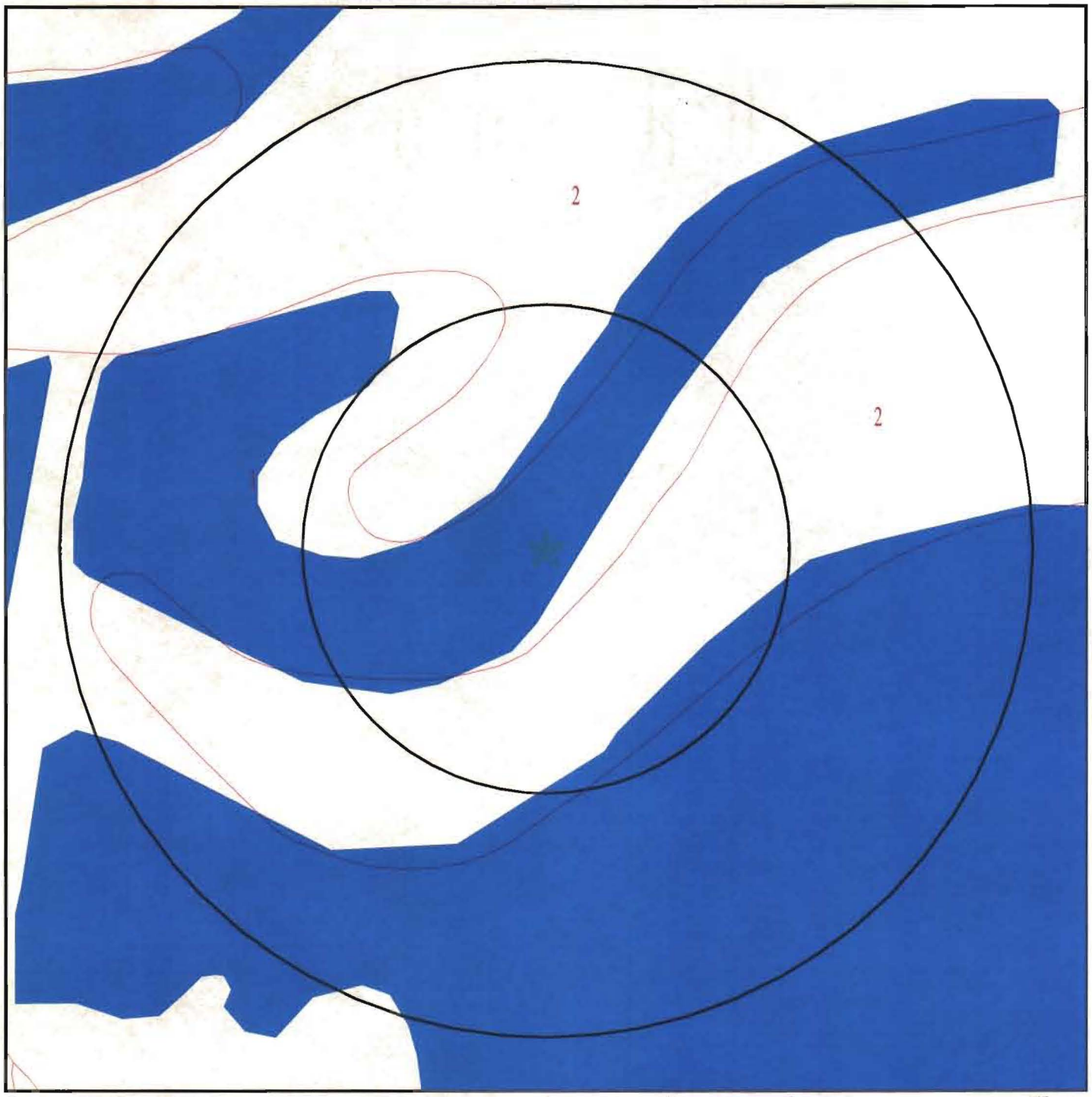
Era:	Paleozoic
System:	Pennsylvanian
Series:	Des Moinesian Series
Code:	PP2 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 2693636.2s



★ Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Rice Lake	CLIENT:	U.S. Army Corp. of Eng. Rock
ADDRESS:	US Hwy 24/IL 9 Canton IL 61520	CONTACT:	Steve Gustafson
LAT/LONG:	40.4833 / 89.9121	INQUIRY #:	2693636.2s
		DATE:	February 05, 2010 5:46 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name:	Water
Soil Surface Texture:	
Hydrologic Group:	Not reported
Soil Drainage Class:	
Hydric Status: Unknown	
Corrosion Potential - Uncoated Steel:	Not Reported
Depth to Bedrock Min:	> 0 inches
Depth to Watertable Min:	> 0 inches

No Layer Information available.

Soil Map ID: 2

Soil Component Name:	Quiver
Soil Surface Texture:	silty clay loam
Hydrologic Group:	Class B/D - Drained/undrained hydrology class of soils that can be drained and are classified.
Soil Drainage Class:	Very poorly drained
Hydric Status: All hydric	
Corrosion Potential - Uncoated Steel:	High
Depth to Bedrock Min:	> 0 inches
Depth to Watertable Min:	> 15 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	9 inches	64 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.23 Min: 1.41	Max: 7.8 Min: 5.6
2	0 inches	9 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.23 Min: 1.41	Max: 7.8 Min: 5.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

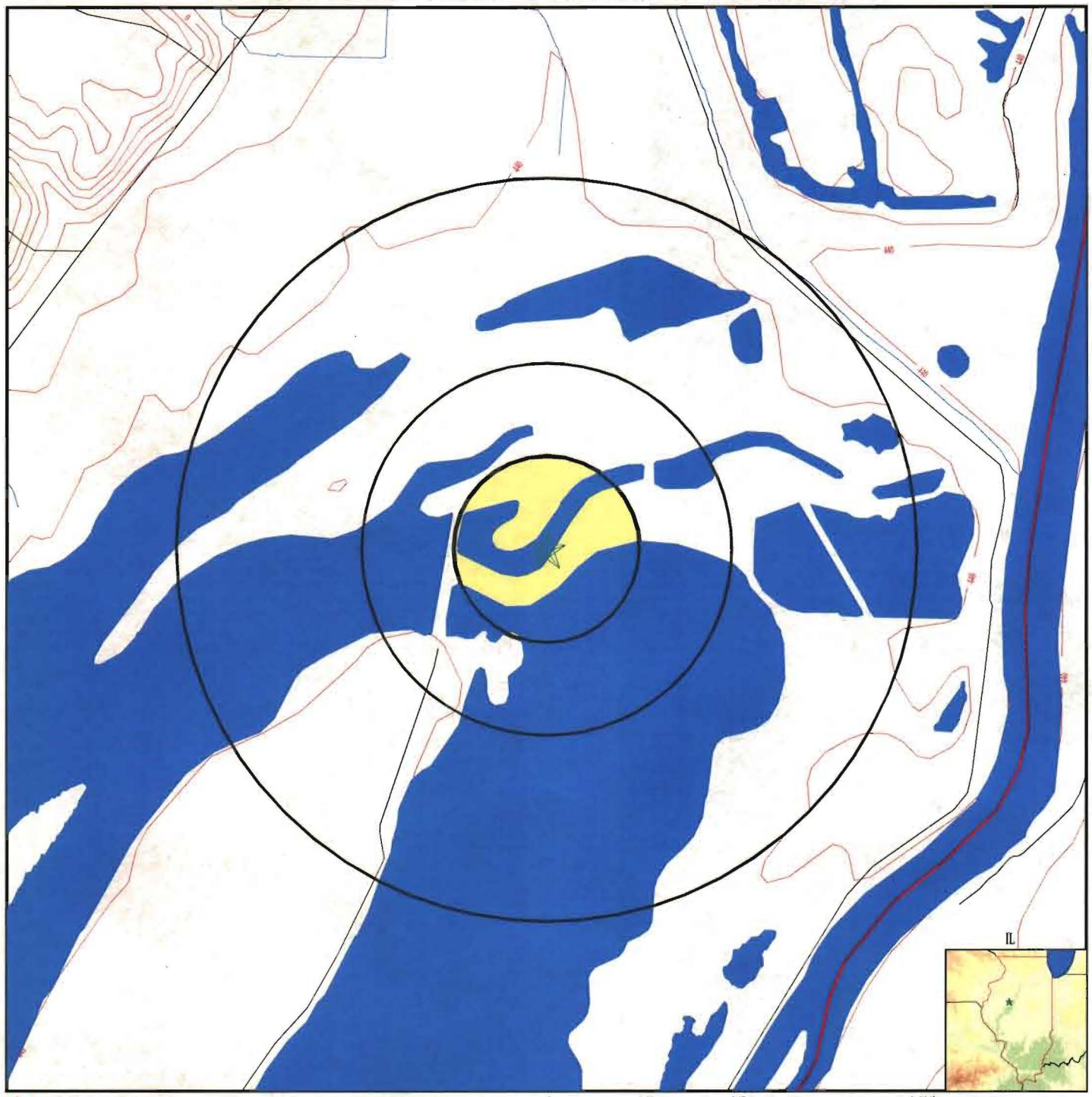
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 2693636.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data

SITE NAME:	Rice Lake	CLIENT:	U.S. Army Corp. of Eng. Rock
ADDRESS:	US Hwy 24/IL 9	CONTACT:	Steve Gustafson
	Canton IL 61520	INQUIRY #:	2693636.2s
LAT/LONG:	40.4833 / 89.9121	DATE:	February 05, 2010 5:46 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: IL Radon

Radon Test Results

Floor	# Sites	Min pCi/L	Avg pCi/L	Max pCi/L	# Sites>4pCi/L	# Sites>20	County
1st Floor bedroom	14	0.9	2.2	4.7	3	0	FULTON
Total	34	0.9	3.7	18.1	8	0	FULTON
Basement	14	1	4.9	18.1	3	0	FULTON
1st Floor living area	5	1.4	4.2	10.3	2	0	FULTON

Federal EPA Radon Zone for FULTON County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 61520

Number of sites tested: 9

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	9.556 pCi/L	33%	44%	22%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2009 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Records
Source: Illinois Geological Survey
Telephone: 217-333-4747

Illinois Private Well Database and PICS (Public, Industrial, Commercial Survey)
Source: Illinois State Water Survey
Telephone: 217-333-9043

Water Well Location Information
Source: Illinois Environmental Protection Agency
Telephone: 217-782-0810

OTHER STATE DATABASE INFORMATION

RADON

State Database: IL Radon
Source: Department of Nuclear Safety
Telephone: 217-785-9958
County Radon Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

| | NRC Home

QUERY RESULTS

BACK TO ENTER QUERY
CREATE NEW QUERY

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Click here to view query results in spreadsheet

View Report	Materials Page	NRC Report #	Type of Call	Date/Time Received	Description Of Incident	Type Of Incident	Incident Cause	Incident Date/Time	Location	State	Nearest City	County	Suspected Responsible Company	Medium Affected	Material Name
View	Materials	801751	INCIDENT	23-JUN-2006 10:30	CALLER STATED THEY WITNESSED THE COMPANY DUMPING OIL PANS FULL OF GASOLINE ONTO THE GROUND. THIS MAY HAVE BEEN GOING ON SINCE FEB OF 06	FIXED	DUMPING	23-JUN-2006 07:00	ENTERPRISE LANE	IL	CANTON	FULTON	BARN AUTO SALES	LAND	GASOLINE: AUTOMOTIVE (UNLEADED)
View	Materials	625717	INCIDENT	11-OCT-2002 10:16	THIS IS AN INITIAL CONTINUOUS RELEASE REPORT.	CONTINUOUS	OTHER	11-OCT-2002 10:00	DUCK CREEK STATION 17751 NORTH CILCO RD.	IL	CANTON	FULTON	CILCO	UNKNOWN	SULFURIC ACID
View	Materials	29114	INCIDENT	01-JUL-1990 19:32	RP DUMPED USED MOTOR OIL AND THE MATERIAL IS ON THE SIDEWALK	FIXED	DUMPING	01-JUL-1990 17:30	CORNER OF FIFTH AND MAPLE ST	IL	CANTON	FULTON		LAND	OIL, MISC: MOTOR
View	Materials	132372	INCIDENT	18-AUG-1992 12:02	UNKNOWN/UNKNOWNSHEEN DESC: 40 YDS LONG AND A FOOT DEEP/BLACK COLORED	UNKNOWN SHEEN	UNKNOWN	18-AUG-1992 10:00	RR 4 STATE HYWY 78	IL	CANTON	FULTON		WATER	UNKNOWN OIL

Click here to view query results in spreadsheet

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BACK TO ENTER QUERY
CREATE NEW QUERY

EPA: United States Environmental Protection Agency

EnviroMapper for Envirofacts

Air, Water, Waste...

Clear

Select an option to map:
- (•) Air (4)
- ( ) Water (5)
- ( ) Waste (3)
- ( ) Land (3)
- ( ) Toxics (1)
- Radiation (0)

View:
(•) All ( ) 20 per page

Single facility

Facility cluster

Program Systems

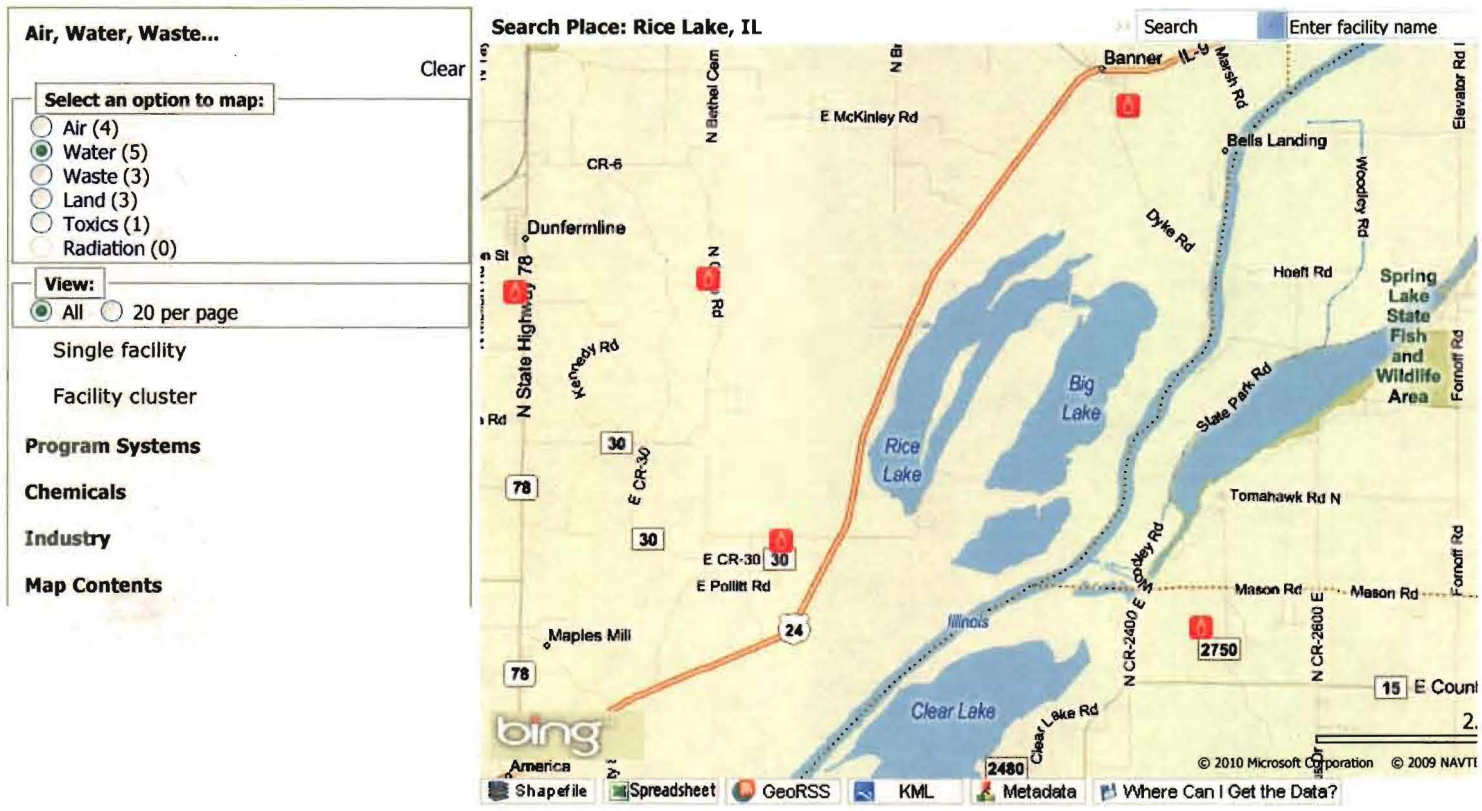
Chemicals

Industry

Map Contents

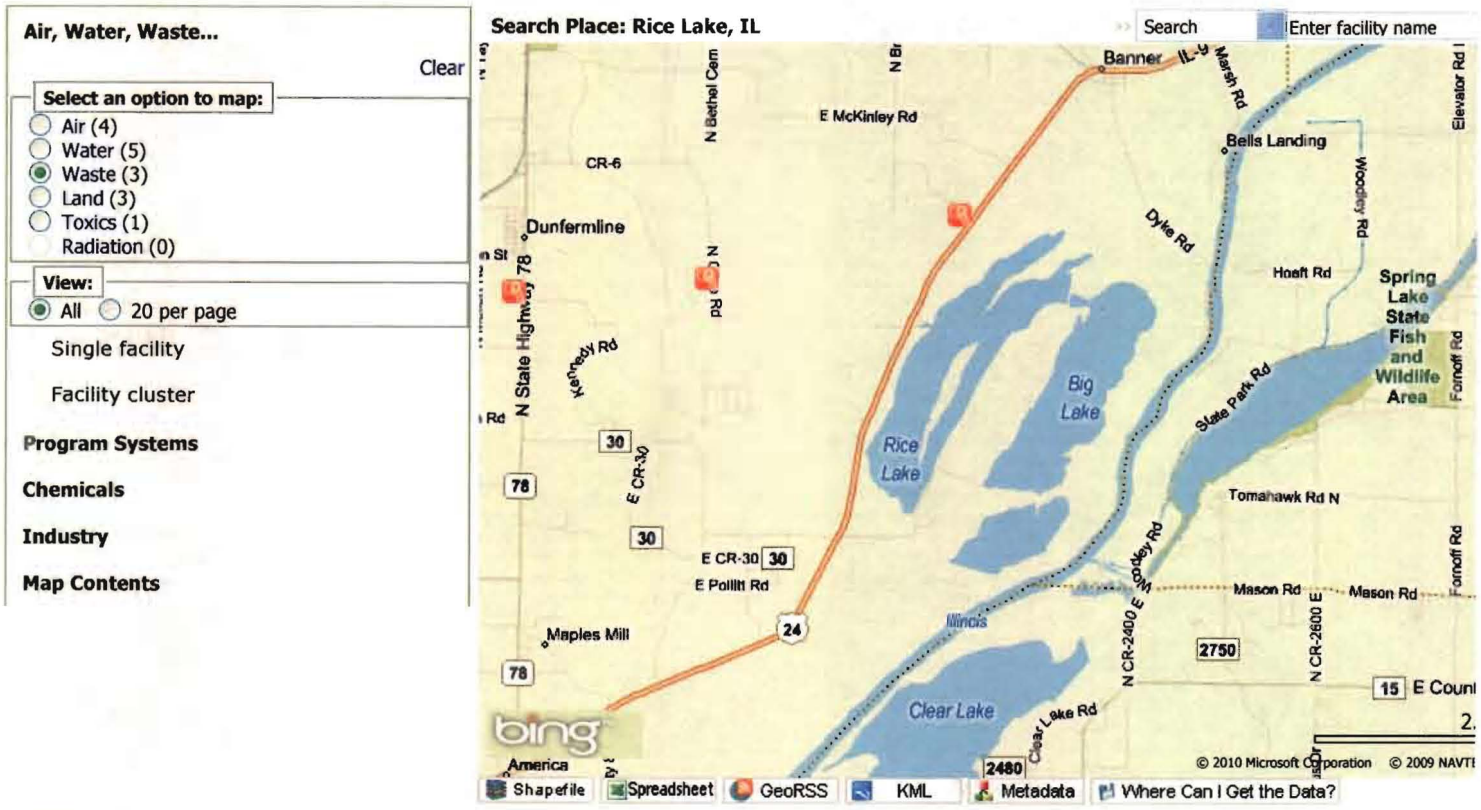
Facility Name/Address	AIRS/AFS	ACRES	CERCLIS	PCS	RADInfo	RCRAInfo	TRI
AMEREN ENERGY RESOURCES GENERATING CO FRS ECHO 17751 NORTH CILCO ROAD CANTON, IL 61520	View Report	-	-	View Report	-	View Report	View Report
BUCKHEART MINE FRS ECHO 4.5 MI. SE OFF RT. 78 CANTON, IL 61520	View Report	-	-	-	-	-	-
CANTON REDI MIX INC FRS ECHO 22381 N STATE HWY 78 CANTON, IL 61520	View Report	-	-	-	-	-	-
HITCHCOCK SCRAPYARD INC FRS ECHO 22501 N RTE 78 CANTON, IL 61520	View Report	-	-	View Report	-	View Report	-

EPA: United States Environmental Protection Agency



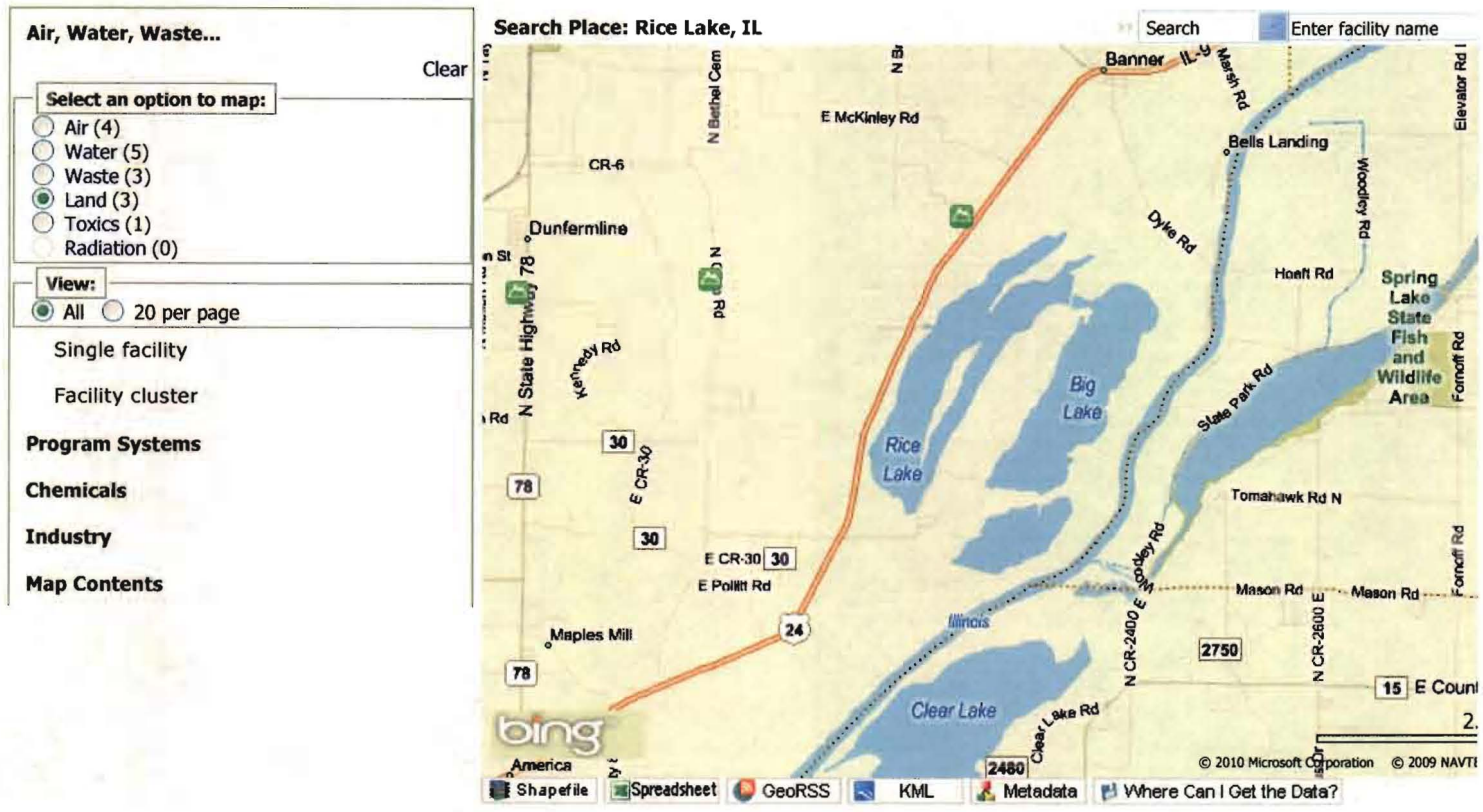
Facility Name/Address	AIRS/AFS	ACRES	CERCLIS	PCS	RADInfo	RCRAInfo	TRI
AMEREN ENERGY RESOURCES GENERATING CO FRS ECHO 17751 NORTH CILCO ROAD CANTON, IL 61520	View Report	-	-	View Report	-	View Report	View Report
BANNER STP FRS ECHO RURAL ROUTE #3 CANTON, IL 61520	-	-	-	View Report	-	-	-
FREEMAN UNITED COAL-BUCKHEART FRS ECHO PO BOX 570 CANTON, IL 61520	-	-	-	View Report	-	-	-
HITCHCOCK SCRAPYARD INC FRS ECHO 22501 N RTE 78 CANTON, IL 61520	View Report	-	-	View Report	-	View Report	-
IDNR-JAKE WOLF MEM FISH HATCH FRS ECHO 25410 N. FISH HATCHERY ROAD TOPEKA, IL 61567	-	-	-	View Report	-	-	-

EPA: United States Environmental Protection Agency



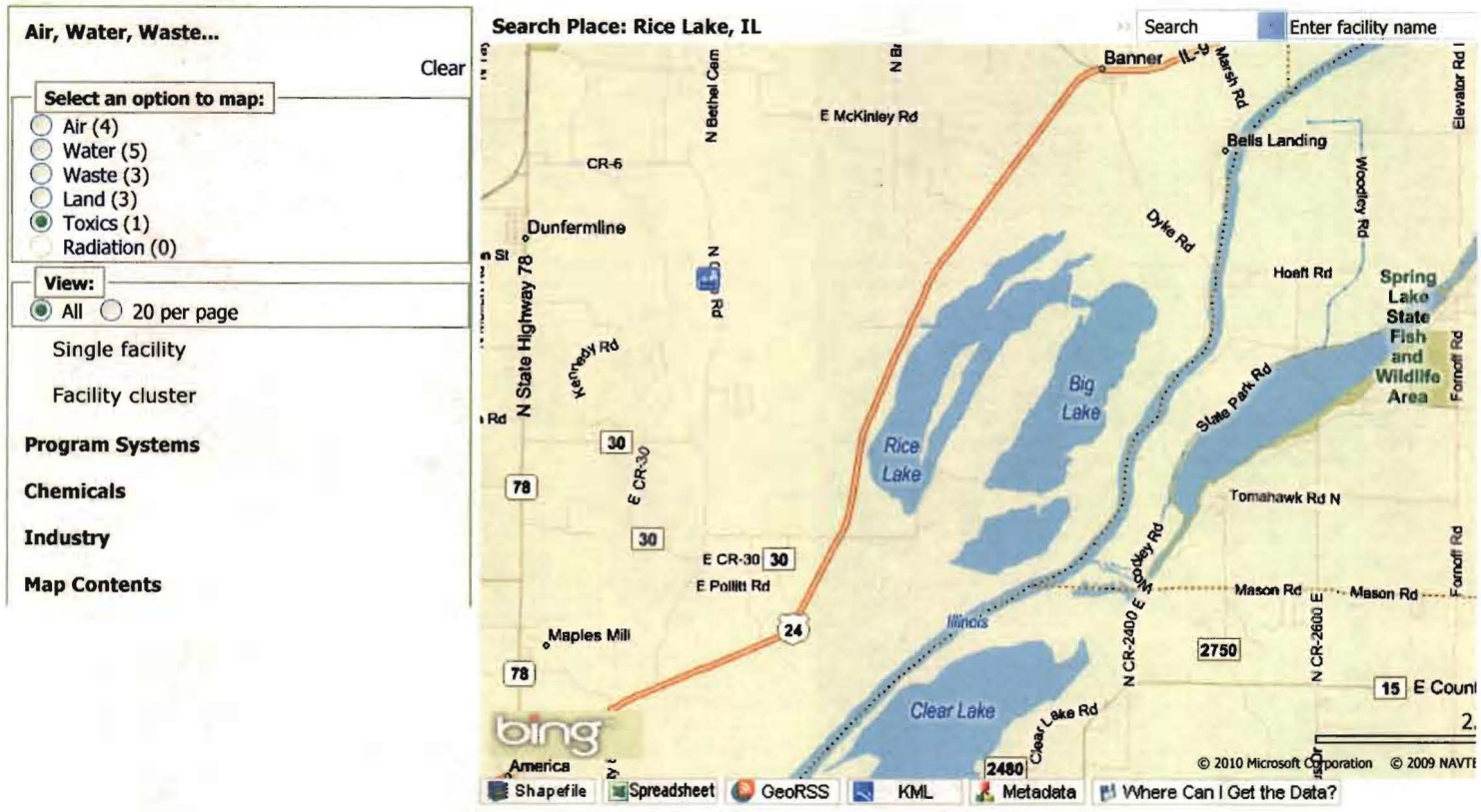
Facility Name/Address	AIRS/AFS	ACRES	CERCLIS	PCS	RADInfo	RCRAInfo	TRI
AMEREN ENERGY RESOURCES GENERATING CO FRS ECHO 17751 NORTH CILCO ROAD CANTON, IL 61520	View Report	-	-	View Report	-	View Report	View Report
AMOCO, FONTANAS FRS ECHO RT 24 BANNER, IL 61520	-	-	-	-	-	View Report	-
HITCHCOCK SCRAPYARD INC FRS ECHO 22501 N RTE 78 CANTON, IL 61520	View Report	-	-	View Report	-	View Report	-

EPA: United States Environmental Protection Agency

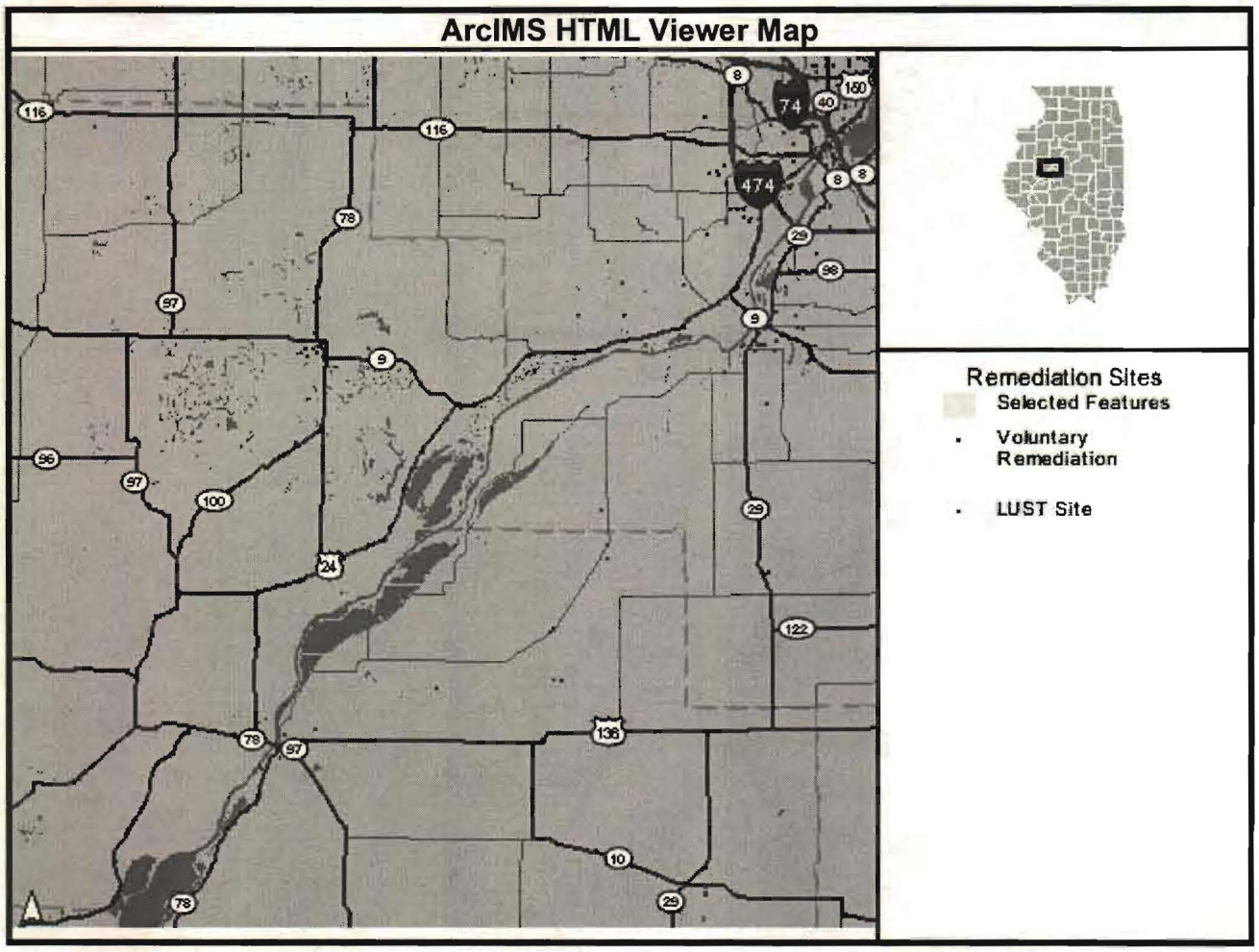


Facility Name/Address	AIRS/AFS	ACRES	CERCLIS	PCS	RADInfo	RCRAInfo	TRI
AMEREN ENERGY RESOURCES GENERATING CO FRS ECHO 17751 NORTH CILCO ROAD CANTON, IL 61520	View Report	-	-	View Report	-	View Report	View Report
AMOCO, FONTANAS FRS ECHO RT 24 BANNER, IL 61520	-	-	-	-	-	View Report	-
HITCHCOCK SCRAPYARD INC FRS ECHO 22501 N RTE 78 CANTON, IL 61520	View Report	-	-	View Report	-	View Report	-

EPA: United States Environmental Protection Agency



Facility Name/Address	AIRS/AFS	ACRES	CERCLIS	PCS	RADInfo	RCRAInfo	TRI
AMEREN ENERGY RESOURCES GENERATING CO (FRS, ECHO) 17751 NORTH CILCO ROAD CANTON, IL 61520	View Report	-	-	View Report	-	View Report	View Report


ArcIMS HTML Viewer Map
Remediation Sites
Selected Features
Voluntary Remediation
LUST Site

Illinois Environmental Protection Agency

www.epa.state.il.us

State of Illinois

L.I.T. Search

IEMA # 940828 **LPC #** 0570255139 **IEMA Date:** 4/18/1994

Site: Capital Development Board

Address: R.R. 3, Box 91, Rice Lake Fish Area
Canton, IL. 61620

County: Fulton

Regulated by: 732

Site Classification: HIGH

Products: Gasoline

20 Day Rpt: 5/9/1994 **45 Day Rpt:** 6/12/1996

Project Manager: John Barrett

Phone: (217) 782-4869 **Email:** John.D.Barrett@illinois.gov

Tank Operator	General	Title XVI	TACO	Claims	Search

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

LAGRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

APPENDIX N
DISTRIBUTION LIST

RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
HONORABLE RICHARD DURBIN UNITED STATES SENATOR UNITED STATES SENATE 525 S 8TH ST SPRINGFIELD IL 62703		1/0					
HONORABLE RICHARD DURBIN UNITED STATES SENATOR UNITED STATES SENATE 309 HART SENATE BLDG WASHINGTON DC 20510		1/0					
HONORABLE MARK KIRK UNITED STATES SENATOR UNITED STATES SENATE 387 RUSSELL SENATE OFC BLDG WASHINGTON DC 20510		1/0					
HONORABLE MARK KIRK UNITED STATES SENATOR UNITED STATES SENATE 607 E ADAMS STE 1520 SPRINGFIELD IL 62701		1/0					
HONORABLE BOBBY SCHILLING REPRESENTATIVE IN CONGRESS-17TH DIST US HOUSE OF REPRESENTATIVES 507 CANNON HOB WASHINGTON DC 20515		1/0					
HONORABLE BOBBY SCHILLING REPRESENTATIVE IN CONGRESS-17TH DIST US HOUSE OF REPRESENTATIVES 367 AVE OF THE CITIES STE D EAST MOLINE IL 61244		1/0					

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
HONORABLE AARON SCHOCK REPRESENTATIVE IN CONGRESS-18TH DIST US HOUSE OF REPRESENTATIVES 100 NE MONROE RM 100 PEORIA IL 61602		1/0					
HONORABLE AARON SCHOCK REPRESENTATIVE IN CONGRESS-18TH DIST US HOUSE OF REPRESENTATIVES 328 CANNON HOUSE OFC BLDG WASHINGTON DC 20515		1/0					
EDWARD BUIKEMA DIRECTOR FEDERAL EMERGENCY MGMT AGENCY - REGION 5 536 S CLARK ST 6TH FLR CHICAGO IL 60605-1509		1/0					
PAUL KRONE NATURAL RESOURCES CONSERVATION SVC US DEPT OF AGRICULTURE 2118 W PARK CT CHAMPAIGN IL 61821-7220		1/0					
BILL LEWIS US DEPT OF AGRICULTURE 2118 W PARK CT CHAMPAIGN IL 61821-		1/0					
KENT CONNAUGHTON REGIONAL FORESTER US FOREST SERVICE - EASTERN REG 9 US DEPT OF AGRICULTURE - FOREST SVC 626 E WISCONSIN AVE MILWAUKEE WI 53202		1/0					

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BUD ALBRIGHT
SECRETARY
OFC OF ENVIRONMENTAL COMPLIANCE
US DEPT OF ENERGY
1000 INDEPENDENCE AVE SW 1/0
WASHINGTON DC 20585

COMMANDER
WESTERN RIVERS REG (OB) - STE 2.104
US DEPT OF HOMELAND SECURITY - US COAST GUARD 8TH DIST AUXILIARY
1222 SPRUCE ST 1/0
ST LOUIS MO 63103

WILLIE TAYLOR
OFC OF ENVIRON POLICY & COMPLIANCE
US DEPT OF INTERIOR
1849 C ST NW 1/0
WASHINGTON DC 20460

FLOYD MIRAS
MARITIME ADMINISTRATION
US DEPT OF TRANSPORTATION
1701 E WOODFIELD RD STE 203 1/0
SCHAUMBURG IL 60173

GREAT LAKES REGION MID CONTINENT OFC
US DEPT OF TRANSPORTATION (MARAD)
1222 SPRUCE ST STE 2.202F 1/0
ST LOUIS MO 63103-2831

TOM SKINNER
ARIEL RIOS BLDG
US ENVIRONMENTAL PROTECTION AGENCY
1200 PENNSYLVANIA AVE NW 2201A 1/0
WASHINGTON DC 20460

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
WILLIAM FRANZ US ENVIRONMENTAL PROTECTION AGENCY - REG 5 77 W JACKSON BLVD CHICAGO IL 60604-3590		1/0					
SHARONNE BAYLOR US FISH AND WILDLIFE SERVICE 51 E 4TH ST RM 101 WINONA MN 55987	1	1/0	1/0			1	
JON DUYVEJONCK US FISH AND WILDLIFE SERVICE 1511 47TH AVE MOLINE IL 61265	1	1/0	1/0		1	1	
RICHARD NELSON FIELD SUPERVISOR US FISH AND WILDLIFE SERVICE 1511 47TH AVE MOLINE IL 61265	1	1/1	1/1			1	
JOHN DOBROVOLNY REG HISTORIC PRESERVATION OFCR US FISH AND WILDLIFE SERVICE - REG 3 BISHOP HENRY WHIPPLE FED BLDG - 1 FEDERAL DR FORT SNELLING MN 55111-4056	0/1	1/0	1/0		1	1	
TOM MELIUS US DEPT OF INTERIOR US FISH AND WILDLIFE SERVICE - REG 3 1 FEDERAL DR BHW FEDERAL BLDG FORT SNELLING MN 55111-4056			1/0				

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GEORGE GARKLAVS DISTRICT CHIEF WATER RESOURCE DIV US GEOLOGICAL SURVEY 2280 WOODDALE DR MOUNDS VIEW MN 55112		1/0					
DR MIKE JAWSON CENTER DIRECTOR UPPER MIDWEST ENVIRON SCIENCES CTR US GEOLOGICAL SURVEY 2630 FANTA REED RD LA CROSSE WI 54603	1	1/0	1/0			1	
DR KEN LUBINSKI UPPER MIDWEST ENVIRON SCIENCES CTR US GEOLOGICAL SURVEY THE NATURE CONSERVANCY 2630 FANTA REED RD LA CROSSE WI 54603	1	1/0	1/0			1	
JOSEPH FERNANDES MID-CONTINENT ECOLOGY DIV/ORD USEPA ENVIRONMENTAL EFFECTS RESEARCH LAB 6201 CONGDON BLVD DULUTH MN 55804		1/0					
POSTMASTER POST OFFICE 301 N MAIN ST LEWISTOWN IL 61542-9998		1/0					
POSTMASTER POST OFFICE PO BOX 9998 KINGSTON MINES IL 61539-9998		1/0					

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POSTMASTER POST OFFICE PO BOX 9998 PEORIA IL 61601-9998		1/0					
POSTMASTER POST OFFICE PO BOX 9998 PEKIN IL 61554-9998		1/0					
POSTMASTER POST OFFICE PO BOX 9998 CANTON MO 63435-9998		1/0					
BRIAN MARKERT ATTN: CEMVS-PM-N US ARMY ENGR DIST - ST LOUIS 1222 SPRUCE ST ST LOUIS MO 63103-2833	1	1/0	1/0			1	
JEFF DEZELLAR ATTN: CEMVP-DPM US ARMY ENGR DIST - ST PAUL 180 5TH ST E STE 700 ST PAUL MN 55101-1638	1	1/0	1/0			1	
CHARLES BARTON ATTN: CEMVD-PD-SP US ARMY ENGR DIV - MISSISSIPPI VALLEY PO BOX 80 VICKSBURG MS 39180	1	1/0	1/0			1	

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COL ALBERT BLEAKLEY JR DEPUTY COMMANDER (SECRETARY- MISSISSIPPI RVR COMM) US ARMY ENGR DIV - MISSISSIPPI VALLEY PO BOX 80 VICKSBURG MS 39180-0080		1/0					
ELIZABETH IVY ATTN: CEMVD-PM-R US ARMY ENGR DIV - MISSISSIPPI VALLEY 1400 WALNUT ST PO BOX 80 VICKSBURG MS 39180-0080	1	1/0	1/10	1	1	1	
PAT BODDY CHIEF PLANNING BUREAU IA DEPT OF NATURAL RESOURCES 502 E 9TH ST WALLACE STATE OFC BLDG DES MOINES IA 50319		1/0					
MIKE GRIFFIN WILDLIFE BIOLOGIST MISS RIVER STATION IA DEPT OF NATURAL RESOURCES 206 ROSE ST BELLEVUE IA 52031	1	1/1	1/1			1	
CHET BORUFF IL DEPT OF AGRICULTURE STATE FAIRGROUNDS PO BOX 19281 SPRINGFIELD IL 62794-9281		1/0					
STEVE CHARD BUREAU OF LAND AND WATER RESOURCES IL DEPT OF AGRICULTURE STATE FAIRGROUNDS PO BOX 19281 SPRINGFIELD IL 62794-9281	1	1/0	1/0				

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IL DEPT OF ENERGY & NATURAL RESOURCES 325 W ADAMS ST SPRINGFIELD IL 61704		1/0					
DIST WILDLIFE BIOLOGIST IL DEPT OF NATURAL RESOURCES 2100 S LAKE STOREY RD GALESBURG IL 61401	1	1/0	1			1	
CHIEF FISHERIES DIVISION IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271	1	1/0	1/0				
GARY CLARK DIRECTOR OFFICE OF WATER RESOURCES IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCE WAY SPRINGFIELD IL 62702-1271		1/0					
MIKE DIEDRICHSEN OFFICE OF WATER RESOURCES IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271	1	1/0	1/0				
BILL DOUGLASS RICE LAKE STATE FISH & WILDLIFE AREA IL DEPT OF NATURAL RESOURCES 19721 N US 24 CANTON IL 61520	1	1/1	1/3	1	1	1	

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
JOE FERENCAK IL DEPT OF NATURAL RESOURCES 2317 E LINCOLN WAY STE A STERLING IL 61081		1/0					
DR HAROLD HASSEN IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271			1/0				
ROB HILSABECK IL DEPT OF NATURAL RESOURCES 13921 W RTE 150 BRIMFIELD IL 61517	1	1/0	1/0			1	
KEN LITCHFIELD OFC OF REALTY AND ENVIRON PLANNING IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271		1/0					
BARRIE MC VEY DISTRICT FORESTER IL DEPT OF NATURAL RESOURCES 640 ARGYLE PARK RD COLCHESTER IL 62326		1/0					
MARC MILLER DIRECTOR IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271		1/0					

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RICK MOLLAHAN CORPS OF ENGRS ECOSYS PROG OFFICE OF RESOURCE CONSERVATION IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY IL STATE FAIRGROUNDS SPRINGFIELD IL 62702-1271	1	1/1	1/1			1	
ARTHUR NEAL IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271		1/0	1/0				
DAN SALLEE FISHERIES ADMINISTRATOR REG I IL DEPT OF NATURAL RESOURCES 2317 E LINCOLN WAY STE A STERLING IL 61081	1	1/0	1/0			1	
MICHELLE SIMONE IL DEPT OF NATURAL RESOURCES 13921 W RTE 150 BRIMFIELD IL 61517	1	1/0	1/0			1	
PAUL VEHLOW IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 63703-2372		1/0					
MIKE WEFER OFFICE OF WILDLIFE/MARSHALL SFWA IL DEPT OF NATURAL RESOURCES 238 ROUTE 26 LACON IL 61540		1/0					

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
TOM BEISSEL IL DEPT OF NATURAL RESOURCES - WILDLIFE 2317 E LINCOLNWAY STE A STERLING IL 61081		1/0	1/0				
IL DEPT OF TRANSPORTATION 401 MAIN ST PEORIA IL 61602		1/0					
JOEL CROSS PLANNING SECT - BUR OF WATER MC#15 IL ENVIRONMENTAL PROTECTION AGENCY 1021 N GRAND AVE E SPRINGFIELD IL 62794-9276		1/0					
BRUCE YURDIN MANAGER WATERSHED MANAGEMENT SECTION IL ENVIRONMENTAL PROTECTION AGENCY 1001 N GRAND AVE E SPRINGFIELD IL 62794-9276	1	1/0	1/0			1	
ANNE HAAKER DEPUTY STATE HIST PRESERVATION OFCR IL HISTORIC PRESERVATION AGENCY 1 OLD STATE CAPITOL PLAZA SPRINGFIELD IL 62701		1/0					
DR GREG SASS DIRECTOR IL RIVER BIOLOGICAL STATION IL NATURAL HISTORY SURVEY 704 N SCHRADER HAVANA IL 62644	1	1/0	1/0			1	

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
LEE ALBRIGHT IL RIVER NWR 19031 E CR 2110 N HAVANA IL 62644		1/0					
DAVID GROSS IL STATE GEOLOGICAL SURVEY 615 E PEABODY DR CHAMPAIGN IL 61820		1/0					
DR NANI BHOWMIK PRINCIPAL SCIENTIST EMERITUS CENTER FOR WATERSHED SCIENCE IL STATE WATER SURVEY 2204 GRIFFITH DR CHAMPAIGN IL 61820-7495		1/0					
THOMAS BUTTS IL STATE WATER SURVEY PO BOX 697 PEORIA IL 61652	1	1/0	1/0				
DR MICHAEL DEMISSIE PRINCIPAL SCIENTIST IL STATE WATER SURVEY 2204 GRIFFITH DR CHAMPAIGN IL 61820		1/0					
TIM SCHLAGENHAFT MN DEPT OF NATURAL RESOURCES 1801 S OAK ST LAKE CITY MN 55041	1	1/0	1/0				1

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	I	II	III	IV	V	VI	1/
JANET STERNBURG CHIEF POLICY COORDINATOR POLICY COORDINATION SECTION MO DEPT OF CONSERVATION 2901 W TRUMAN BLVD PO BOX 180 JEFFERSON CITY MO 65109	1	1/0	1/1			1	
GRETCHEN BENJAMIN THE NATURE CONSERVANCY (TNC) 5605 MEIR COURT LA CROSSE WI 54601	1	1/0	1/0			1	
JIM FISCHER MISSISSIPPI RIVER PLANNER WI DEPT OF NATURAL RESOURCES 3550 MORMON COULEE RD 108 STATE OFC BLDG LA CROSSE WI 54601	1	1/0	1/0				
JEFF JANVRIN HABITAT PROJECTS COORDINATOR WI DEPT OF NATURAL RESOURCES 3550 MORMON COULEE RD LA CROSSE WI 54601	1	1/0	1/1			1	
HONORABLE DAVID KOEHLER IL SENATE REPRESENTATIVE DIST 46 IL STATE SENATOR 13 S CAPITOL ST PEKIN IL 61554		1/0					
HONORABLE JERRY MITCHELL IL REPRESENTATIVE DIST 90 IL HOUSE OF REPRESENTATIVES 630 CAPITAL BLDG SPRINGFIELD IL 62706		1/0					

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HONORABLE MICHAEL SMITH
IL REPRESENTATIVE DIST 91
IL HOUSE OF REPRESENTATIVES
45 E SIDE SQUARE STE 301 1/0
CANTON IL 61520

KAREN WITTER
EXECUTIVE DIRECTOR
GOVERNOR'S SCIENCE ADVISORY COMMITTEE
2010 S WAILLEMORE AVE 1/0
SPRINGFIELD IL 62704

MARY SOLECKI
IL NATURE PRESERVE COMMISSION
PO BOX 497 1/0
SIDNEY IL 61877

PAM GIBSON
IL COUNCIL OF WATERSHEDS
866 DOOLIN 1/0
JACKSONVILLE IL 62650

COUNTY ATTORNEY
100 N MAIN ST PO BOX 226 1/0
LEWISTOWN IL 61542

WILLIAM KUHN
COUNTY ENGINEER
FULTON COUNTY
430 E OAK ST 1/0
CANTON IL 61520-3155

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VI - Project Performance Evaluation Documents

JAMES "JIM" NELSON
COUNTY CLERK
FULTON COUNTY
100 N MAIN ST PO BOX 226 1/0
LEWISTOWN IL 61542

EDWARD KETCHAM
CHAIRPERSON
FULTON COUNTY BOARD
100 N MAIN ST PO BOX 226 1/0
LEWISTOWN IL 61542

SANDRA MONARI
FULTON COUNTY BOARD
100 N MAIN ST PO BOX 226 1/0
LEWISTOWN IL 61542

MARY LOU ROUNDS
SUPERVISOR
BANNER TOWNSHIP
26369 E BROWN RD 1/0
CANTON IL 61520

HONORABLE KENNETH FUELLER
MAYOR
CITY OF BANNER
PO BOX 701 360 S FULTON ST 1/0 1/0
CANTON IL 61520-9803

HONORABLE KEVIN MEADE
MAYOR
CITY OF CANTON
2 N MAIN ST 1/0
CANTON IL 61520

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NANCY ERICKSON
IL FARM BUREAU
1701 TOWANDA AVE PO BOX 2901 1/0
BLOOMINGTON IL 61702-2901

LARRY JAMISON
PARAGON MARINE SERVICE INC/CONSOLIDATED GRAIN & BARGE
PO BOX 290 1/0
BLUFFS IL 62621

JAMES BULL
CHAIRMAN-COMMISSIONER
EAST LIVERPOOL DRAINAGE & LEVEE DIST
21583 E US HWY 24 1/0
LEWISTOWN IL 61542

MICHAEL KLINGNER
PRESIDENT
(VICE CHAIRMAN - UMIMRA)
KLINGNER & ASSOCIATES
616 N 24TH ST 1/0
QUINCY IL 62301-2797

WARREN WOLF
CHAIRMAN-COMMISSIONER
LIVERPOOL DRAINAGE & LEVEE DIST
20544 E US RTE 24 1/0
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THOMAS WATSON
COMMISSIONER
PEKIN & LAMARSH DRAINAGE & LEVEE DIST
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MANITO IL 61546

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CHAIRMAN-COMMISSIONER
SPRING LAKE DRAINAGE & LEVEE DIST
7360 SKY RANCH RD 1/0
MANITO IL 61546

TODD SHELABARGER
CHAIRMAN
SPRING LAKE DRAINAGE & LEVEE DIST
7538 BASS RD 1/0
MANITO IL 61546

DR CHARLES WARTHEN
FOUNDATION DIRECTOR
KEWANEE SCHOOLS FOUNDATION
1211 E 3RD ST 1/0
KEWANEE IL 72554

EAST PEORIA EXTENSION CENTER
UNIV OF ILLINOIS COOP EXTENSION SVC
727 SABRINA DR 1/0
EAST PEORIA IL 61611

DR JOHN BRADEN
DIRECTOR - WATER RESOURCES CENTER
278 ENVIRONMENTAL & AG SCIENCES BLDG
UNIVERSITY OF ILLINOIS
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URBANA IL 61801

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LEWISTOWN IL 61542-1304
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PEORIA PUBLIC LIBRARY
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PEORIA IL 61602-1021
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THOMAS TINCHER
EXECUTIVE DIRECTOR
HEARTLAND WATER RESOURCES COUNCIL
416 MAIN ST STE 828
PEORIA IL 61612
1/0

DARLENE J BRUCE
NATURAL RESOURCES CHAIRPERSON
GREENWAYS BOARD
LEAGUE OF WOMEN VOTERS
505 W CRESTWOOD DR
PEORIA IL 61614
1/0

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
MILDRED BRYANT ILLINOIS RIVER VALLEY RESIDENTS 3120 N CALIFORNIA PEORIA IL 61603		1/0					
TERRENCE INGRAM PRESIDENT/EXEC DIR EAGLE NATURE FOUNDATION, LTD 300 E HICKORY ST APPLE RIVER IL 61001			1/0				
JOYCE BLUMENSHINE HEART OF ILLINOIS SIERRA CLUB 2419 E RESERVOIR BLVD PEORIA IL 61614		1/0	1/0				
KATHY ANDREWS OUTDOOR IL MAGAZINE IL DEPT OF NATURAL RESOURCES ONE NATURAL RESOURCES WAY SPRINGFIELD IL 62702-1271			1/0				
DOUG BLODGETT CHAIRMAN/COMMISSIONER THOMPSON LAKE DRAINAGE & LEVEE DIST IL RVR PROJECT DIR-THE NATURE CONSERVANCY 11304 N PRAIRIE RD LEWISTOWN IL 61542		1/0	1/0				
PAUL HANSEN EXECUTIVE DIRECTOR MIDWEST OFFICE IZAAK WALTON LEAGUE OF AMERICA 1619 DAYTON AVE #202 ST PAUL MN 55104-6206		1/0					

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RICK & TRACY FOX
PEORIA AUDUBON SOCIETY
15215 IVY LAKE RD
CHILLICOTHE IL 61523

III: 1/0

JENNIFER FEYERHERM
SIERRA CLUB - MIDWEST OFFICE
122 W WASHINGTON AVE STE 830
MADISON WI 53703

II: 1/0

MIKE REUTER
SR DIR CENTRAL US CONSERVATION STRATEGIES
NORTH AMERICA REGION
THE NATURE CONSERVANCY
PO BOX 9637
PEORIA IL 61602

II: 1/0

BARB NARAMORE
UPPER MISSISSIPPI RIVER BASIN ASSOC (UMRBA)
415 HAMM BLDG 408 ST PETER ST
ST PAUL MN 55102

II: 1/0

VALERIE DECARLO
HISTORIC PRESERVATION SPECIALIST
ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 PENNSYLVANIA AVE NW #809
WASHINGTON DC 20004

II: 1/0

JEFF LAMPE
JOURNAL STAR
1 NEWS PLAZA
PEORIA IL 61643

III: 1/0

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	I	II	III	IV	V	VI	1/
KAREN SORENSEN ASST CITY EDITOR PEORIA JOURNAL STAR - NEWS ROOM 1 NEWS PLAZA PEORIA IL 61643		1/0	1/0				
ELAINE HOPKINS PEORIA STAR JOURNAL ONE NEWS PLAZA PEORIA IL 61643		1/0	1/0				
WBYS RADIO STATION BOX 600 CANTON IL 61520		1/0	1/0				
MARK B WBYS/WLDD 1645 E CHESTNUT ST #15 CANTON IL 61520			1/0				
NEWS EDITOR NEWS ROOM WIRL RADIO NEWS 331 FULTON ST STE 1200 PEORIA IL 61602		1/0	1/0				
GARY MOORE NEWS ROOM WXCL RADIO 4234 N BRANDYWINE DR PEORIA IL 61614		1/0	1/0				

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
NEWS ROOM WEEK-TV CHANNEL 25 - NEWS ROOM 2907 SPRINGFIELD RD EAST PEORIA IL 61611		1/0	1/0				
WHOI-TV - NEWS ROOM 500 N STEWART ST CREVE COEUR IL 61622		1/0	1/0				
NEWS EDITOR NEWS ROOM WMBD TV NEWS 3131 N UNIVERSITY ST PEORIA IL 61604		1/0	1/0				
BRIAN BLUMENSHINE WMBD TV NEWS 3131 N UNIVERSITY PEORIA IL 61604			1/10				
NEWS DIRECTOR NEWS ROOM WTVP-TV CHANNEL 47 1501 W BRADLEY AVE PEORIA IL 61625		1/0	1/0				
JOSEPH A 805 N 9TH CANTON IL 61520			1/0				

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	I	II	III	IV	V	VI	1/
DICK BALL 373 S FULTON ST BANNER IL 61520-9313			1/0				
JOHN BALL 12777 N BALL RD LEWISTOWN IL 61542			1/0				
AL - LINDA BEHM 89 SALDANA WAY HOTSPRINGS VILLAGE AR 71909-7401		1/0					
RICK BOHM 220 JOHNSTON ST EAST PEORIA IL 61611			1/0				
RANDY BOHM 350 MAPLE WOOD CREVE COEUR IL 61610		1/0	1/0				
CARL BROWN 21117 N BROWN RD CANTON IL 61520			1/0				

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RICE LAKE, IL	10Y	11 JAN 11	I	II	III	IV	V	VI	1/
ROGER CLARK 341 W BARRINGTON RD PEORIA IL 61614-6005					1/0				
MERL COTTON 10220 W LAKE CAMELOT DR MAPLETON IL 61547					1/0				
DANNY DAVID 9427 REED CITY RD MAPLETON IL 61547					1/0				
SCOTT DENANES 3710 N BRECKENRIDGE PEORIA IL 61614					1/0				
CHRIS DURAND 4107 S DUNBAR PT MAPLETON IL 61547-9422					1/0				
BRIAN FLEMING 16727 W SHIRCK RD GLASFORD IL 61533					1/0				

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RICE LAKE, IL	10Y	11 JAN 11	I	II	III	IV	V	VI	1/
ALEX FULLER 340 S FULTON ST BANNER IL 61520					1/0				
RICHARD FULLER 220 W HYMAN ST BANNER IL 61520					1/0				
STEVE GALL 5310 S DIETRICH BARTONVILLE IL 61607					1/0				
JEFF GALL 5017 PFEIFFER RD BARTONVILLE IL 61607					1/0				
MARVIN GALL 5108 PFEIFFER RD BARTONVILLE IL 61607					1/0				
LOWELL (BUD) GRIEVES 26715 E BROWN RD CANTON IL 61520					1/0				

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
KEN GRIGSBY 1405 E WALNUT ST CANTON IL 61520-2379			1/0				
ERIK GRIGSBY 21574 N US 24 CANTON IL 61520			1/0				
JOHN & LORRAINE GRIGSBY 19942 N US HWY 24 CANTON IL 61520		1/0	1/0				
DENNIE GUPPY 3725 LAUDER AVE BARTONVILLE IL 61607			1/0				
LARRY GUPPY SR 3725 LAUDER AVE BARTONVILLE IL 61607			1/0				
DIANNA HARPER 19882 N US 24 CANTON IL 61520			1/0				

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STEVE HAVERA 10510 E CHRISTMAS TREE RD LEWISTOWN IL 61552			1/0				
STEVE HOAK 204 HEMLOCK PEKIN IL 61554			1/0				
TONY HUMMEL 22610 N CR 2800 E TOPEKA IL 61567			1/0				
ROGER INGOLD 2719 DEVERON CIR PEKIN IL 61554-8325			1/0				
ADAM JAEGLE 5305 W SUMMIT AVE BARTONVILLE IL 1607			1/0				
RANDY JAEGLE PO BOX 174 KINGSTON MINES IL 61539		1/0	1/0				

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RANDY JAEGUE PO BOX 174 KINGSTON MINES IL 61539					1/0				
DUANE JOHNSON 19169 E CR 1800 N HAVANA IL 62644					1/0				
SCOTT KASING 7602 S JEFFERSON ST BARTONVILLE IL 61607					1/0				
MERLE KEEFER 1312 NORTHGATE PEKIN IL 61554					1/0				
DAVID KISLER 26712 MCKINLY RD CANTON IL 61520					1/0				
SCOTT KLASING 7602 S JEFFERSON ST BARTONVILLE IL 61604					1/0				

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RICHARD KNACKMUHS
24084 N TANYA CT
MANITO IL 61546-7877 1/0

HOWARD M
2170 E R 9
CANTON IL 61520 1/0

SCOTT MALLICOAT
2925 S TURBETT RD
HANNA CITY IL 61536-9708 1/0

DAN MARAS SR
5025 W MAHARK LN
BARTONVILLE IL 61607 1/0

RYAN MARVIN
7401 LANCASTER RD
BARTONVILLE IL 61607 1/0

W K MC COX
210 E 8TH
GLASFORD IL 61533 1/0

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PATRICK MILLER 4227 S FAIRVIEW DR BARTONVILLE IL 61607					1/0				
PAT MILLER 4227 S FAIRVIEW DR BARTONVILLE IL 61607					1/0				
DAVID MORRILL PO BOX 9668 PEORIA IL 61614					1/0				
FRED NAU 9701 REED CITY RD MAPLETON IL 61547-9707					1/0				
ROBERT NEEL 17752 E CO RD 24 FARMINGTON IL 61531					1/0				
JIM OLT 1828 VALLE VISTA BLVD PEKIN IL 61554-6341					1/0				

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
LARRY OVERCASH 300 W QUEEN WOOD RD MORTON IL 61550		1/0	1/0				
WILLIAM PEAK 270 N 2ND AVE CANTON IL 61520		1/0	1/0				
JENNY PEMBERTON 1831 N SHORE DR PEKIN IL 61554-5231			1/0				
RANDY READER 1610 E MYRTLE APT 206 B CANTON IL 61520		1/0	1/0				
JR ROEPEMACK 213 HEMLOCK PEKIN IL 61554			1/0				
RUSS ROKEPENACK 213 HEMLCOK ST PEKIN IL 61554-2519			1/0				

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RICE LAKE, IL	10Y	11 JAN 11	I	II	III	IV	V	VI	1/
LARRY RUPERT 13525 W CLARK RD GLASFORD IL 61533					1/0				
ERIC SCHENCK 229 N 3RD CANTON IL 61520					1/0				
GREG SHEELY 432 N ILLINOIS ST MORTON IL 61550					1/0				
EVERETT SHUE 1600 S 5TH ST PEKIN IL 61554					1/0				
GARY STEVENSON 3315 W STARR ST PEORIA IL 61605					1/0				
JOHN STIGLISH 216 S JUDD BRYANT IL 61519					1/0				

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RICE LAKE, IL 10Y 11 JAN 11	I	II	III	IV	V	VI	1/
GARY THOMAS 6205 S HOLLIS RD BARTONVILLE IL 61607		1/0	1/0				
JANE WARD 21816 E US 24 HWY LEWISTOWN IL 61542			1/0				
ROBERT WILDER 4718 S LAKE CAMELOT DR MAPLETON IL 61547			1/0				
ROBERT WILLIAMS 26712 E MCKINLEY RD CANTON IL 61520-8616			1/0				
TRACY FOX SIERRA CLUB/AUDUBON 15215 N IVY LANE RD CHILLICOTHE IL 61523			1/0				
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CEMVR-EC-C	1	1/0	1/0	1	1	1
CEMVR-EC-D	1	1/0	1/0	1	1	1
CEMVR-EC-TE	1	1/0	1/0	5		
CEMVR-EC-DN	3	3/3	3/3	1	1	1
CEMVR-EC-DN (FELLMAN)	1	1/0	1/0	1	1	1
CEMVR-EC-DS	1	1/0	1/0	1	1	1
CEMVR-EC-G	1	1/0	1/0	1	1	1
CEMVR-EC-H	1	1/1	1/0	1	1	1
CEMVR-EC-HH	1	1/0	1/0	1	1	1
CEMVR-EC-HQ	1	1/0	1/0	1	1	1
CEMVR-EC-T	1	1/0	1/0	1	1	1
CEMVR-EM			1/0		1	
CEMVR-IM-CL	1	1/1	2/2		2	2
CEMVR-OC	1	1/0	1/0	1		
CEMVR-OD	1	1/0	1/0	1	1	1
CEMVR-OD-IV (PATRIDGE)	1	1/0	1/0			
CEMVR-OD-IV (CROSS)	1	1/0	1/0			
CEMVR-OD-MN	1	1/0	1/0	1	1	1
CEMVR-OD-MN (LUNDH)	1	0/1	1/0	1	1	1
CEMVR-OD-P	1	1/0	1/0	1	1	1
CEMVR-OD-PP (HANNEL)	1	1/0	1/0			
CEMVR-OD-T (KLINGMAN)	1	1/0	1/0	1	1	1
CEMVR-PA	1	1/0	1/0			1
CEMVR-PD-E	1	3/3	3/3	1	1	2
CEMVR-PD-E (CARMACK)	1	3/3	3/3	1	1	2
CEMVR-PD-F	1	1/0	1/0	1	1	1
CEMVR-PD-F (NILES)	3	3/3	3/3	1	2	2
CEMVR-PM-M (HUBBELL)	1	1/1	1/1	1	1	1
CEMVR-PM-M (GOETZMANN)	2	2/2	2/2		2	2
CEMVR-RE	1	1/0	1/0			
CEMVR-RE-P	1	1/0	1/0			

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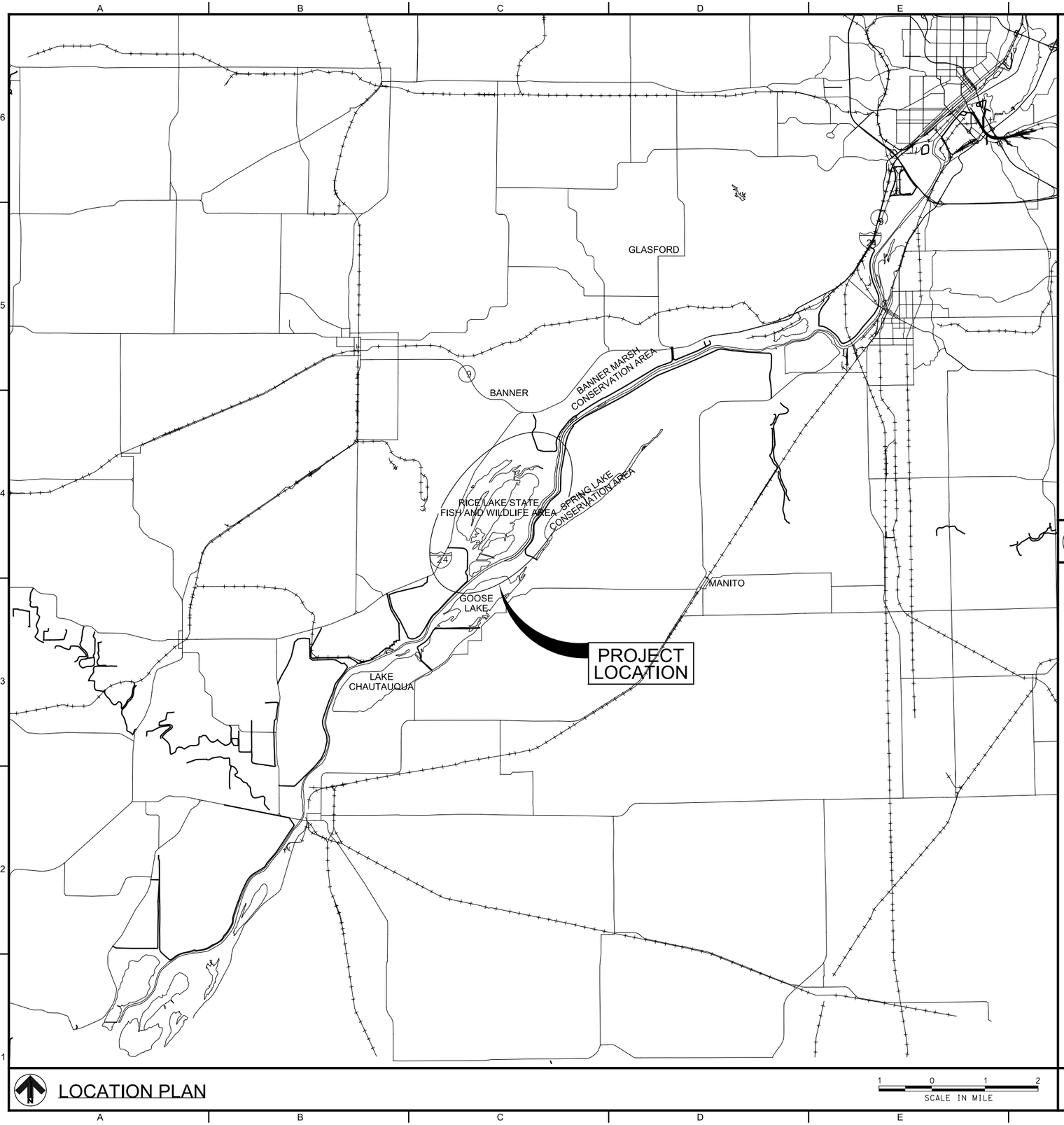
UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT (R-17F)

RICE LAKE STATE FISH AND WILDLIFE AREA
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

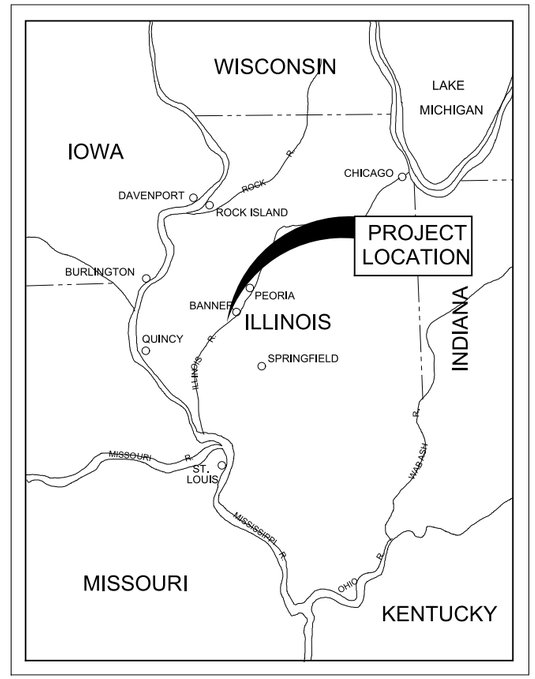
LA GRANGE POOL, ILLINOIS WATERWAY
RIVER MILES 132.0 THROUGH 138.0
FULTON COUNTY, ILLINOIS

PLATES



LOCATION PLAN

SCALE IN MILE 1 0 1 2



VICINITY MAP

NO SCALE

LEGEND

- INDICATES SECTION
- A
- IF DRAWN ON SAME SHEET
- INDICATES SECTION
- A
- A-001 | A-001
- SHEET REFERENCE NUMBER FROM WHICH SECTION IS TAKEN
- SHEET REFERENCE NUMBER ON WHICH DETAIL IS DRAWN

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF
Drawn By: LLH
Checked By:
Reviewed By: HLA
Dates:
Scale: AS SHOWN
Project Code:
Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

LOCATION PLAN, VICINITY MAP, AND LEGEND

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Sheet 1 of 35

35% REVIEW

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PLATE01.dgn

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PLATE 2	INDEX AND GENERAL NOTES
PLATE 3	EXISTING CONDITIONS SITE PLAN
PLATE 4	PROJECT ENHANCEMENT FEATURES EVALUATED
PLATE 5	PROJECT ENHANCEMENT FEATURES NOT EVALUATED
PLATE 6	RECOMMENDED PLAN
PLATE 7	SPILLWAY PLAN AND PROFILE STA. 0+00 TO STA. 25+00
PLATE 8	SPILLWAY PLAN AND PROFILE STA. 25+00 TO STA. 50+00
PLATE 9	SPILLWAY PLAN AND PROFILE STA. 50+00 TO STA. 75+00
PLATE 10	SPILLWAY PLAN AND PROFILE STA. 75+00 TO STA. 100+00
PLATE 11	SPILLWAY PLAN AND PROFILE STA. 100+00 TO STA. 125+00
PLATE 12	SPILLWAY PLAN AND PROFILE STA. 125+00 TO STA. 150+00
PLATE 13	SPILLWAY PLAN AND PROFILE STA. 150+00 TO STA. 175+00
PLATE 14	SPILLWAY PLAN AND PROFILE STA. 175+00 TO STA. 200+00
PLATE 15	SPILLWAY PLAN AND PROFILE STA. 200+00 TO STA. 225+00
PLATE 16	SPILLWAY PLAN AND PROFILE STA. 225+00 TO STA. 240+46
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PLATE 18	GATEWELL STRUCTURE PLAN AND SECTION
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PLATE 32	BORING LOGS I
PLATE 33	BORING LOGS II
PLATE 34	BORING LOGS III
PLATE 35	POST CONSTRUCTION MONITORING PLAN

GENERAL NOTES:

1. ALL ELEVATIONS ARE NGVD 29.

US Army Corps of Engineers ®
Rock Island District

Revisions

Symbol	Description	Date	Approved

Designed By: RCF
Drawn By: LLH
Checked By:
Reviewed By: HLA
Date:
Scale: AS SHOWN
Project Code:
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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

INDEX AND GENERAL NOTES

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PLATE 2
Sheet 2 of 35

35% REVIEW

GAGE INFORMATION IS AS FOLLOWS:

NAME	LOCATION	GAGE ZERO	FLAT POOL
HAVANA GAGE	RIVERMILE 119.6	424.4 FT NGVD (1929)	429.2
COPPERAS CREEK GAGE	RIVERMILE 136.8	428.0 FT NGVD (1929)	429.5
KINGSTON MINES GAGE	RIVERMILE 145.4	428.0 FT NGVD (1929)	427.7

EXISTING CHANNEL
EXISTING ACCESS ROAD
EXISTING VOORHEES PUMP STATION AND WATER CONTROL STRUCTURE
OLD COPPERAS LOCK
ILLINOIS RIVER
RM 137
COPPERAS CREEK
VOORHEES UNIT
LEVEE
FLOW
RM 136
ILLINOIS RIVER
EXISTING GATEWELL STRUCTURE
EXISTING RICE LAKE PUMP STATION
POND LILY LAKE
RM 135
SENATE ISLAND
SLIM LAKE NATURAL AREA
SLIM LAKE
NARROWS DAM
WEST RIVER
RM 134
BIG LAKE
HOXIE RIDGE
RM 133
GOOSE LAKE
FOOTPRINT OF OLD HATE LEVEE
DUCK ISLAND
BEEBE LAKE
MISERABLE ISLAND
QUARRY PIT
RICE LAKE
DUCK CREEK
EXISTING ACCESS ROAD
EXISTING ADMINISTRATION BUILDINGS
U.S. HIGHWAY 24

LEGEND:
- STATE PROPERTY BOUNDARY
- EXISTING CULVERT (18" UNLESS OTHERWISE NOTED)
- EXISTING 60" CMP STOPLOG STRUCTURE
- EXISTING 36" CMP STOPLOG STRUCTURE
RM 123 - RIVER MILE MARKER
- EXISTING LEVEE

1000 0 1000 2000
SCALE IN FEET

EXISTING CONDITIONS SITE PLAN

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

EXISTING CONDITIONS SITE PLAN

Sheet Reference Number:
PLATE 3
Sheet 3 of 35

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PLATE03.dgn

35% REVIEW

EXISTING CHANNEL
INSTALL NEW PUMP STATION CONTROL BUILDING
CONSTRUCT NEW PUMP STATION FOR BIG LAKE OR RICE LAKE AND BIG LAKE
REMOVE EXISTING VORHEES PUMP STATION AND REPLACE EXISTING WATER CONTROL STRUCTURE
ILLINOIS RIVER
RM 137
OLD COPPERAS LOCK
INSTALL NEW DISCHARGE PIPE
EXISTING ACCESS ROAD
COPPERAS CREEK
EXCAVATE NEW DISCHARGE CHANNEL
VOORHEES UNIT
CONSTRUCT NEW DISCHARGE STRUCTURE
FLOW
RM 136
ILLINOIS RIVER
LEAVE IN PLACE, REMOVE OR ABANDON EXISTING RICE LAKE PUMP STATION
CONSTRUCT NEW WATER CONTROL STRUCTURES
POND LILY LAKE
RM 135
SENATE ISLAND
SLIM LAKE
NARROWS DAM
WEST RIVER
RM 134
BIG LAKE
CONSTRUCT OVERLAND FLOW SPILLWAY TOP EL. 440.0 TO 442.5 FT. NGVD FROM STA. 55+00 TO END
HOXIE RIDGE
MAST TREE PLANTINGS
CONSTRUCT NEW GATEWELL STRUCTURE
CONSTRUCT NEW FISH EGRESS STRUCTURE
NATIVE GRASS PLANTINGS
RM 133
GOOSE LAKE
DUCK ISLAND
BEEBE LAKE
STA. 40+50
CONSTRUCT ARMORED OVERFLOW SPILLWAY, TOP EL. 440.0 FT. NGVD
MISERABLE ISLAND
QUARRY PIT
RICE LAKE
STA. 15+50
CONSTRUCT NEW FISH EGRESS STRUCTURE
CONSTRUCT OVERFLOW SPILLWAY TOP EL. 440.0 FT. NGVD FROM STA. 0+00 TO 15+50 AND STA. 40+50 TO 55+00
DUCK CREEK
EXISTING ADMINISTRATION BUILDING
U.S. HIGHWAY 24
EXISTING ACCESS ROAD

LEGEND:
- STATE PROPERTY BOUNDARY
- EXISTING CULVERT (18" UNLESS OTHERWISE NOTED)
- EXISTING 60" CMP STOPLOG STRUCTURE
- EXISTING 36" CMP STOPLOG STRUCTURE
RM 123 - RIVER MILE MARKER
- EXISTING LEVEE
- NEW LEVEE/BERM

PROJECT ENHANCEMENT FEATURES EVALUATED

1000 0 1000 2000
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Designed By: RCF	Date:		
Drawn By: LLH	Scale: AS SHOWN		
Checked By:	Project Code:		
Reviewed By: HLA	Solicitation Number:		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

PROJECT ENHANCEMENT FEATURES EVALUATED

Sheet Reference Number:
PLATE 4
Sheet 4 of 35

35% REVIEW

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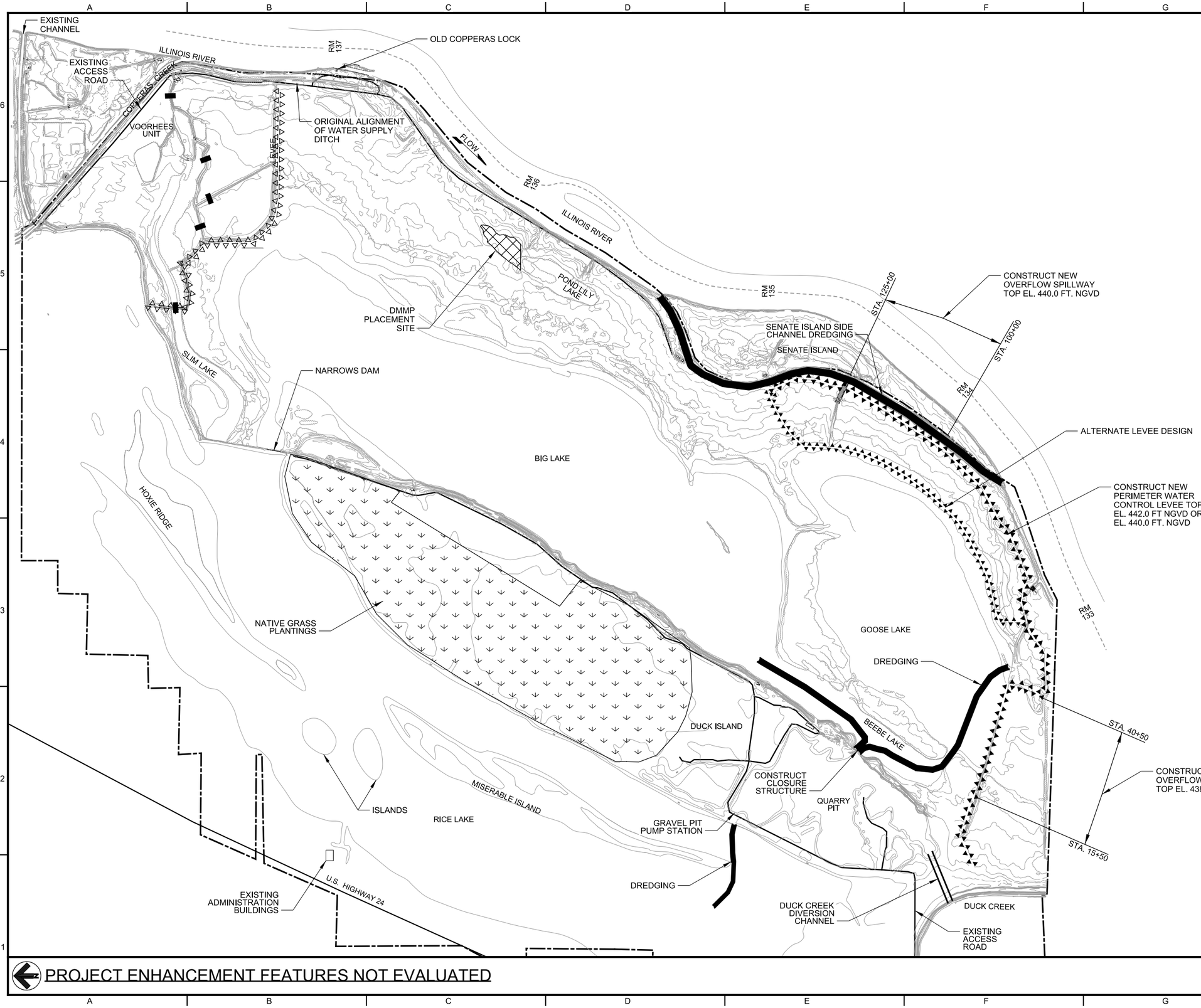
PLATE04.dgn



PROJECT ENHANCEMENT FEATURES NOT EVALUATED

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By:	RCF
Drawn By:	LLH
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Reviewed By:	HLA
Date:	
Scale:	AS SHOWN
Project Code:	
Solicitation Number:	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL

RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

ENHANCEMENT FEATURES NOT EVALUATED

Sheet Reference Number: PLATE 5
Sheet 5 of 35

35% REVIEW

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PLATE05.dgn

EXISTING CHANNEL

REMOVE EXISTING VOORHEES PUMP STATION AND REPLACE EXISTING WATER CONTROL STRUCTURE

INSTALL NEW PUMP STATION CONTROL BUILDING

CONSTRUCT NEW PUMP STATION FOR RICE LAKE AND BIG LAKE

OLD COPPERAS LOCK

INSTALL NEW DISCHARGE PIPE

ILLINOIS RIVER

COPPERAS CREEK

EXISTING ACCESS ROAD

VOORHEES UNIT

PLACE CONCRETE ARTICULATED MAT

FLOW

RM 136

ILLINOIS RIVER

RM 137

REMOVE EXISTING RICE LAKE PUMP STATION

EXCAVATE NEW DISCHARGE CHANNEL AND CONSTRUCT NEW WATER CONTROL STRUCTURES

POND LILY LAKE

RM 135

SENATE ISLAND

SLIM LAKE

NARROWS DAM

WEST RIVER

RM 134

BIG LAKE

CONSTRUCT OVERLAND FLOW SPILLWAY TOP EL. 440.0 TO 442.5 FT. NGVD FROM STA. 55+00 TO END

HOXIE RIDGE

CONSTRUCT NEW FISH EGRESS STRUCTURE

CONSTRUCT NEW GATEWELL STRUCTURE

NATIVE GRASS PLANTINGS

MAST TREE PLANTINGS

RM 133

GOOSE LAKE

CONSTRUCT OVERFLOW SPILLWAY, TOP EL. 440.0 FT NGVD FROM 0+00 TO 15+50 AND STA. 40+50 TO 55+00, SEE DETAILS ON PLATE 17

POTENTIAL BORROW AREA

CONSTRUCT ARMORED OVERFLOW SPILLWAY, TOP EL. 440.0 FT. NGVD, SEE DETAILS ON PLATE 17

STA. 40+50

DUCK ISLAND

BEEBE LAKE

MISERABLE ISLAND

QUARRY PIT

RICE LAKE

STA. 15+50

NEW FISH EGRESS STRUCTURE TO BE CONSTRUCTED AT A LATER DATE

CONSTRUCT NEW ACCESS ROAD

DUCK CREEK

EXISTING ACCESS ROAD

EXISTING ADMINISTRATION BUILDINGS

U.S. HIGHWAY 24

LEGEND:

- STATE PROPERTY BOUNDARY
- EXISTING CULVERT (18" UNLESS OTHERWISE NOTED)
- EXISTING 60" CMP STOPLOG STRUCTURE
- EXISTING 36" CMP STOPLOG STRUCTURE
- RM 123 - RIVER MILE MARKER
- EXISTING LEVEE
- NEW LEVEE/BERM

RECOMMENDED PLAN

1000 0 1000 2000
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Date:		
Drawn By: LLH	Scale: AS SHOWN		
Checked By:	Project Code:		
Reviewed By: HLA	Solicitation Number:		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

RECOMMENDED PLAN

Sheet Reference Number:
PLATE 6
Sheet 6 of 35

35% REVIEW

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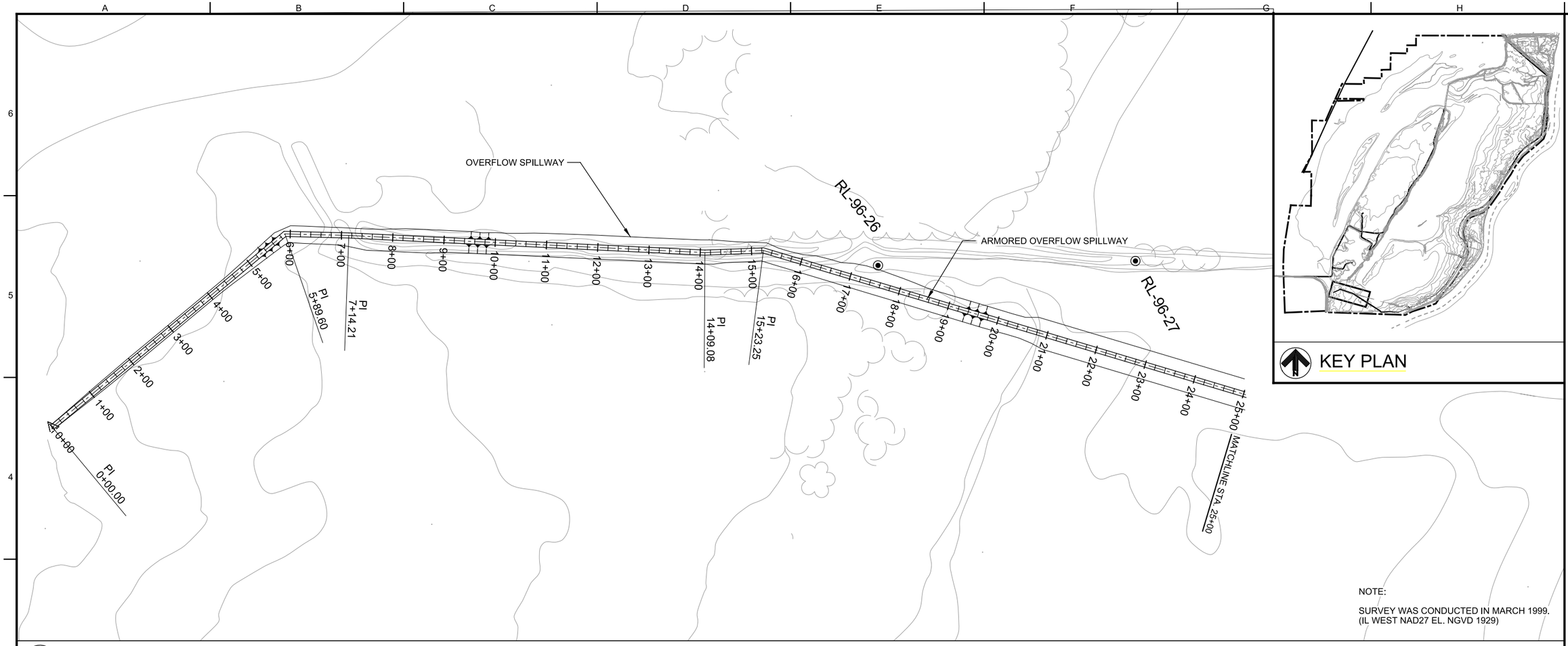
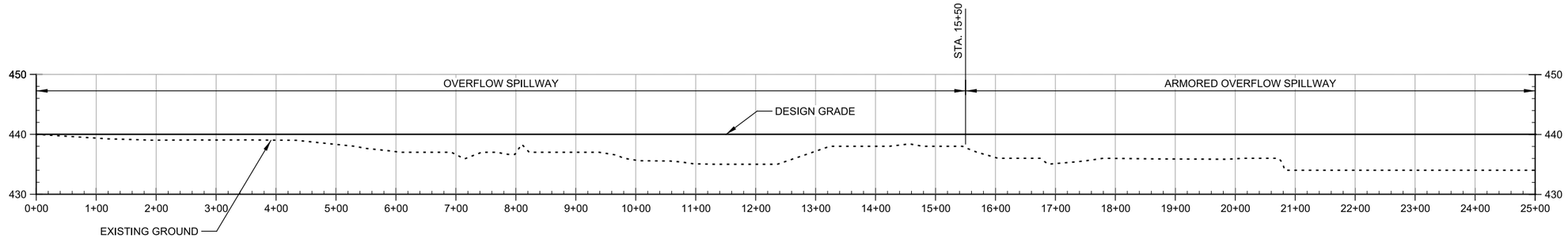
PLATE06.dgn



PLAN

KEY PLAN



PROFILE STA. 0+00 TO 25+00

100 0 100 200
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY PLAN AND PROFILE STA. 0+00 TO 25+00

Sheet Reference Number:
PLATE 7
Sheet 7 of 35

35% REVIEW

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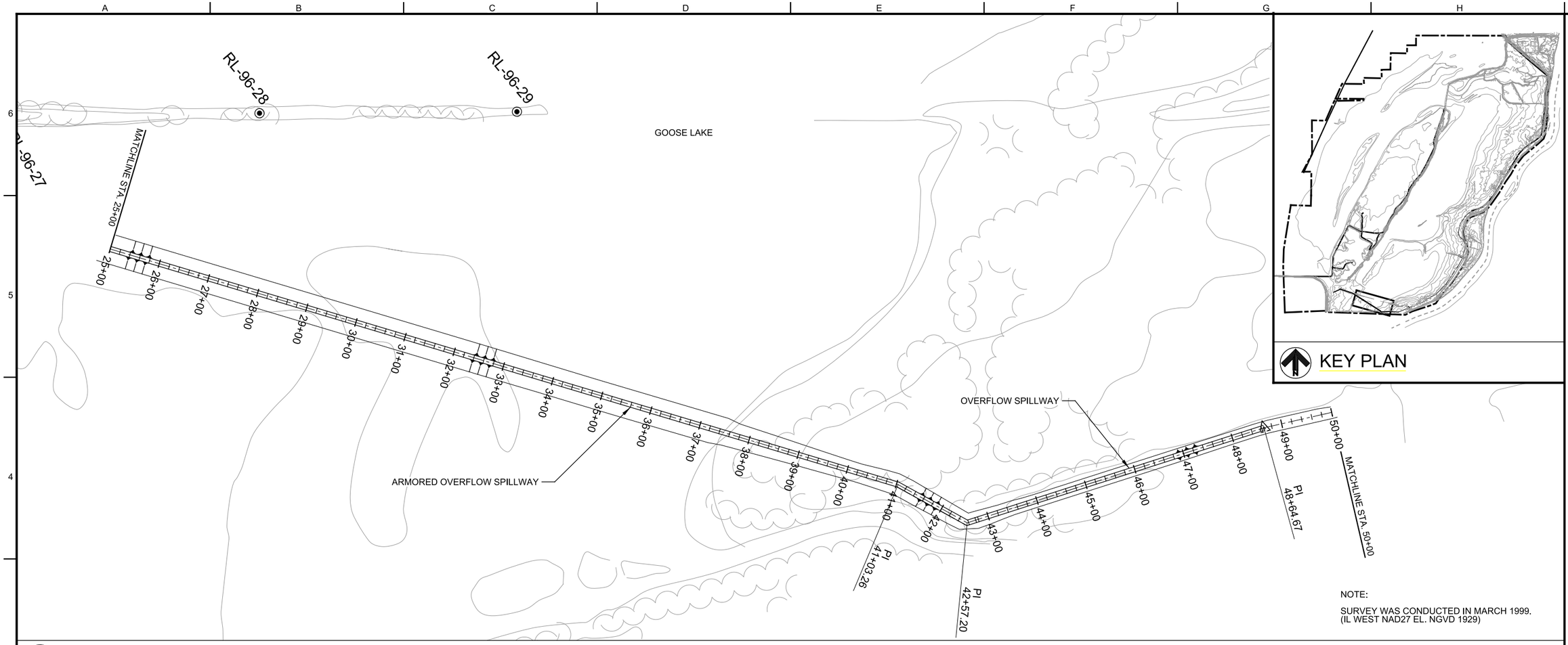
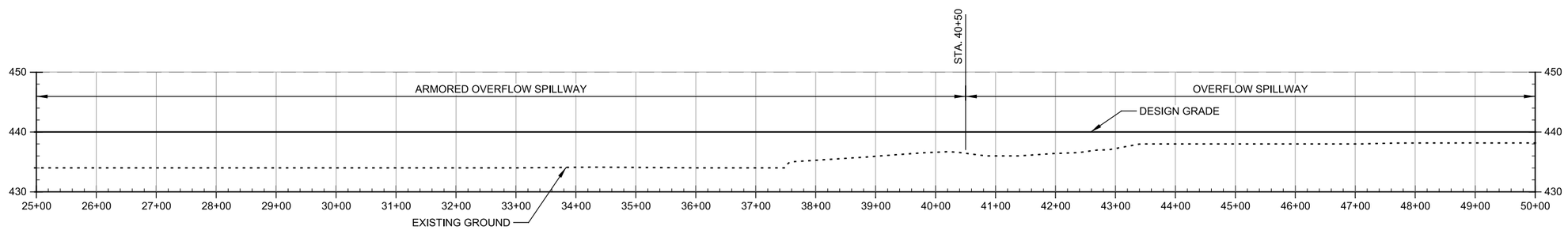
PLATE7.dgn



KEY PLAN

NOTE:

SURVEY WAS CONDUCTED IN MARCH 1999.
(IL WEST NAD27 EL. NGVD 1929)



PROFILE STA. 25+00 TO 50+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Date:	Solicitation Number:	
Drawn By: LLH	Scale: AS SHOWN		
Checked By:	Project Code:		
Reviewed By: HLA			

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY PLAN AND PROFILE STA. 25+00 TO 50+00

Sheet Reference Number:
PLATE 8
Sheet 8 of 35

35% REVIEW

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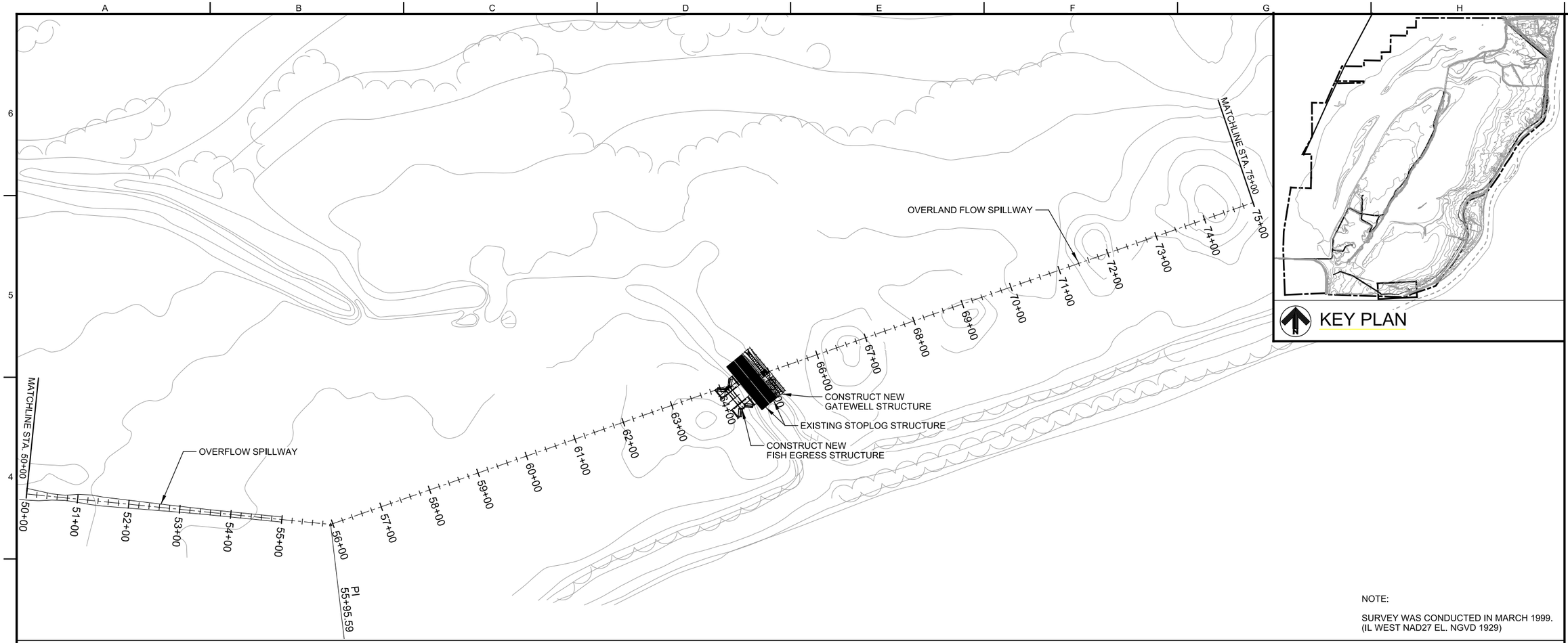
PLATE08.dgn

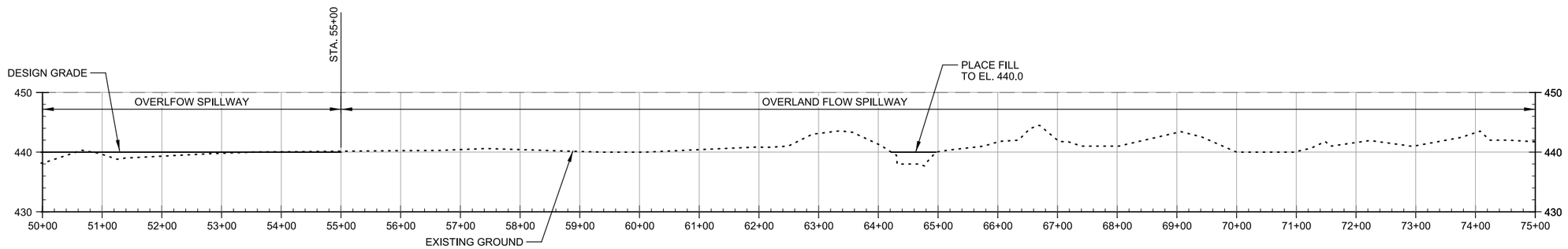


PLAN

NOTE:

SURVEY WAS CONDUCTED IN MARCH 1999.
(IL WEST NAD27 EL. NGVD 1929)

100 0 100 200
SCALE IN FEET



PROFILE STA. 50+00 TO 75+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY PLAN AND PROFILE STA. 50+00 TO 75+00

Sheet Reference Number:
PLATE 9
Sheet 9 of 35

35% REVIEW

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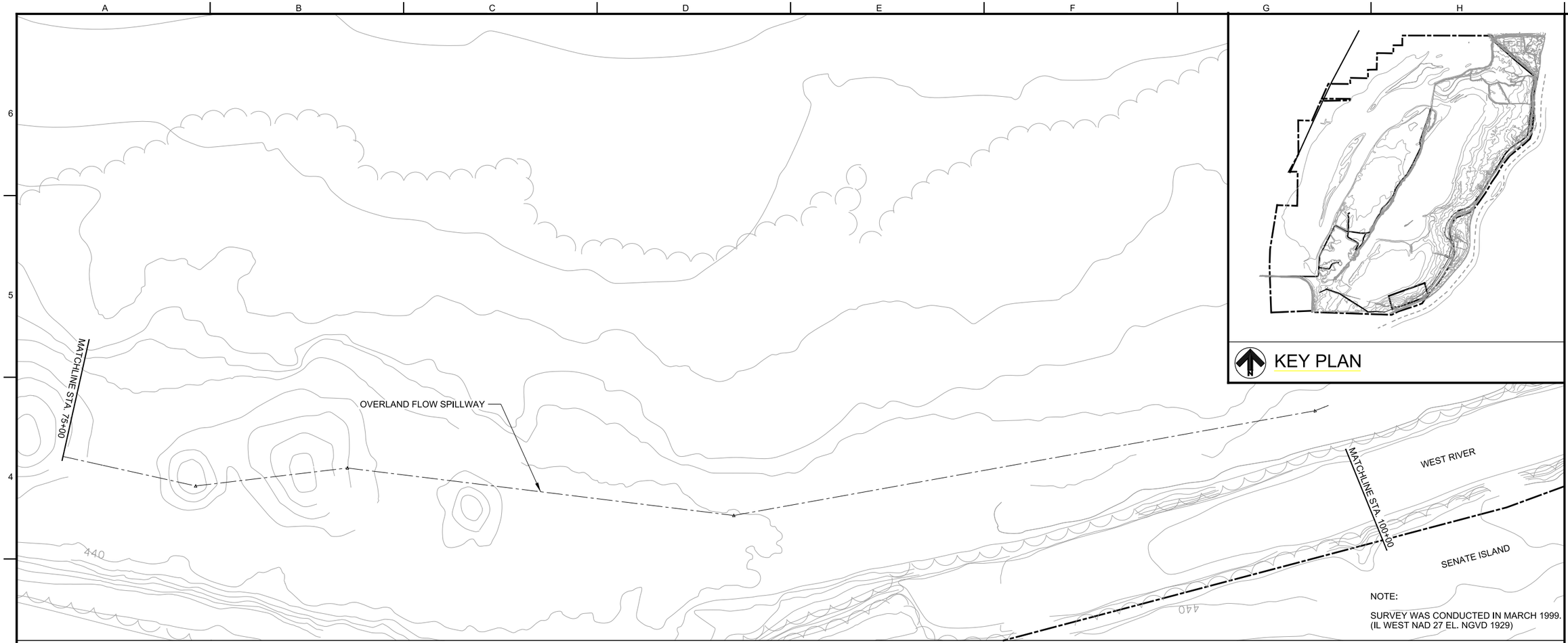
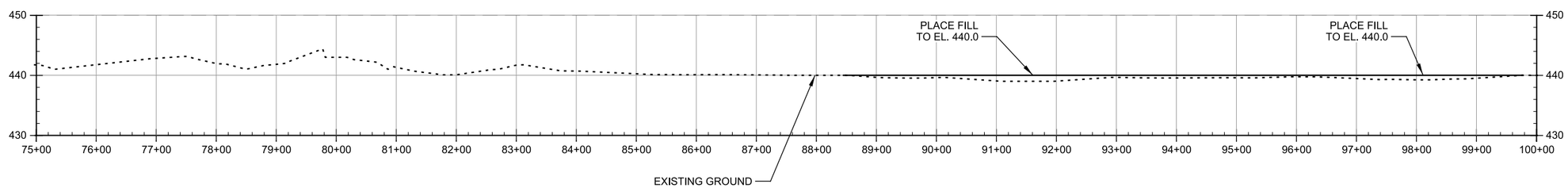
PLATE9.dgn



PLAN

KEY PLAN



PROFILE STA. 75+00 TO 100+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Designed By: RCF	Date:		
Drawn By: LLH	Scale: AS SHOWN		
Checked By:	Project Code:		
Reviewed By: HLA	Solicitation Number:		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY PLAN AND PROFILE STA. 75+00 TO 100+00

Sheet Reference Number:
PLATE 10
Sheet 10 of 35

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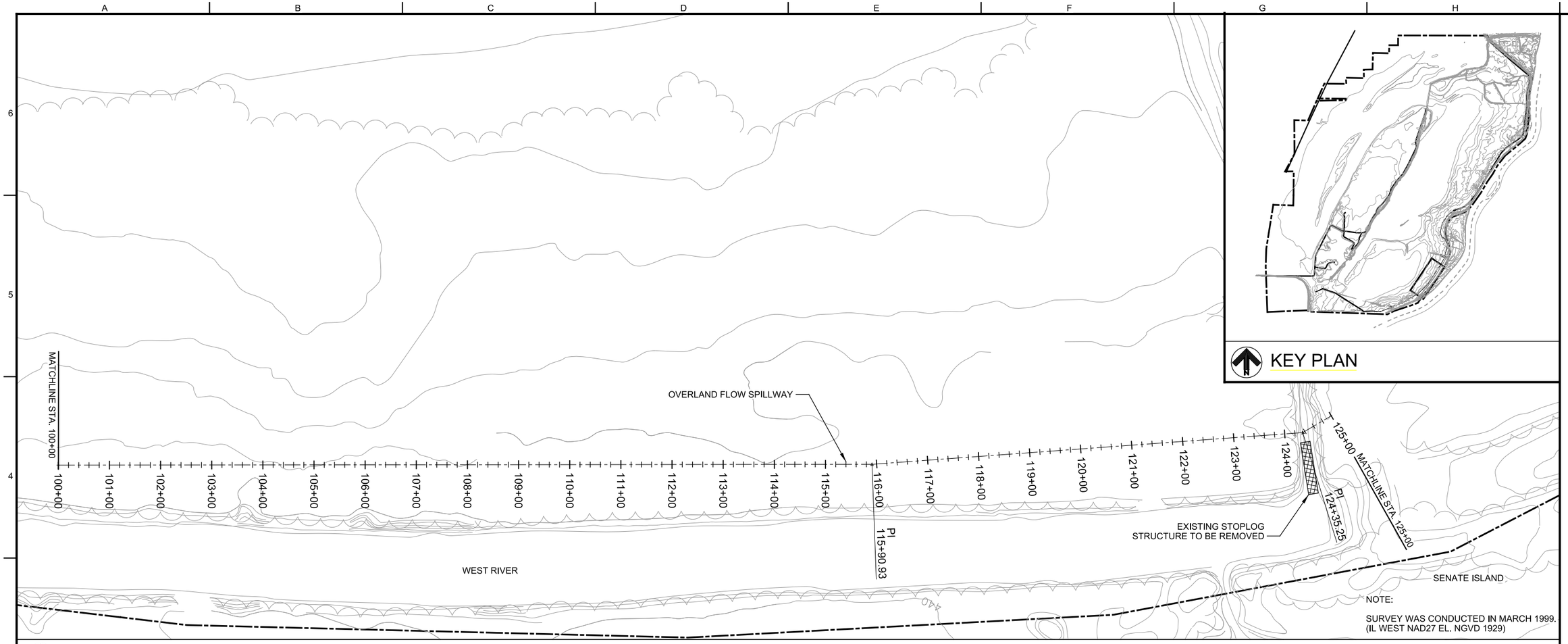
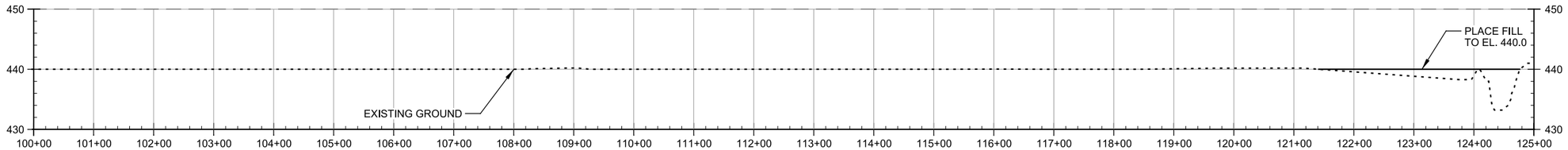
PLATE 10.dgn

35% REVIEW



PLAN

KEY PLAN



PROFILE STA. 100+00 TO 125+00

NO SCALE

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PLATE11.dgn

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Dates:	Scale: AS SHOWN	Project Code:	Solicitation Number:

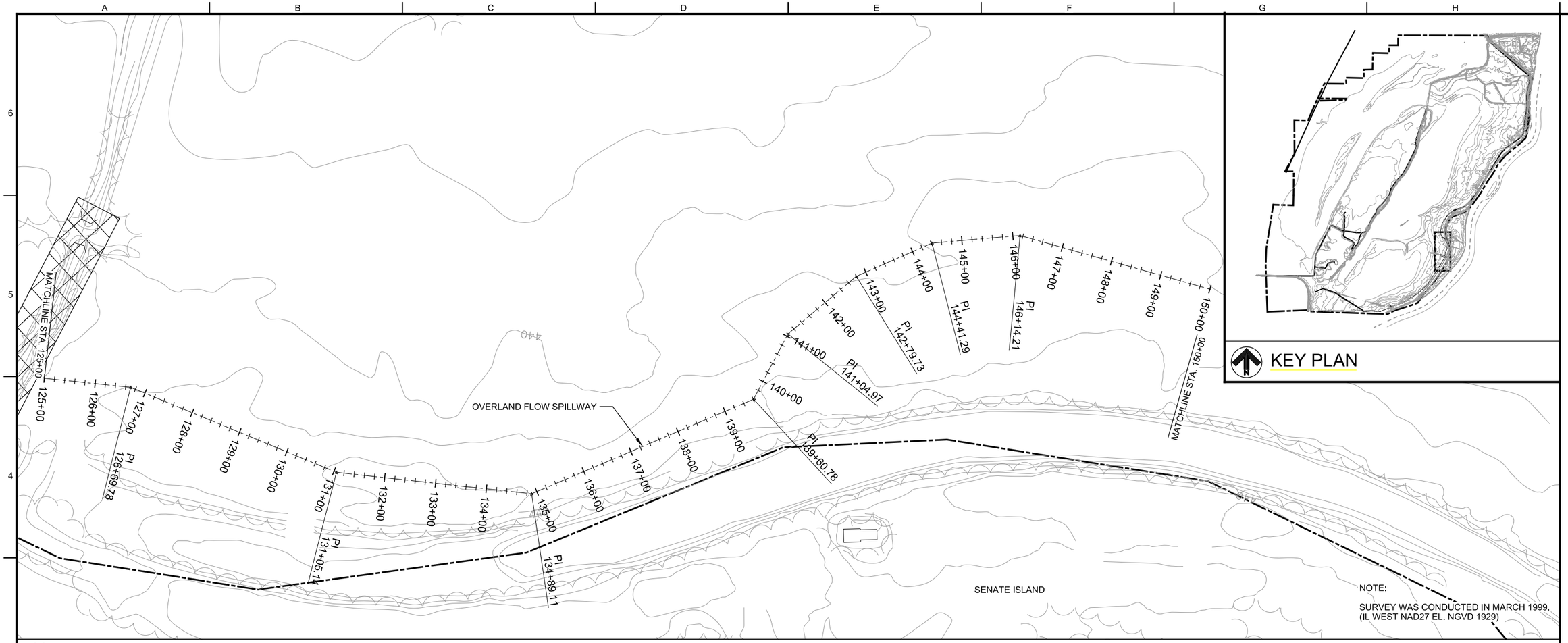
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY
PLAN AND PROFILE
STA. 100+00 TO 125+00

Sheet Reference Number:
PLATE 11
Sheet 11 of 35

35% REVIEW



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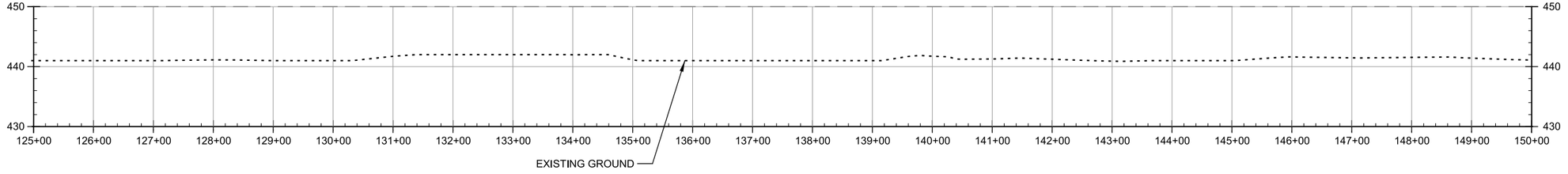

PROFILE STA. 125+00 TO STA. 150+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY PLAN AND PROFILE STA. 125+00 TO 150+00

Sheet Reference Number:
PLATE 12
Sheet 12 of 35

35% REVIEW

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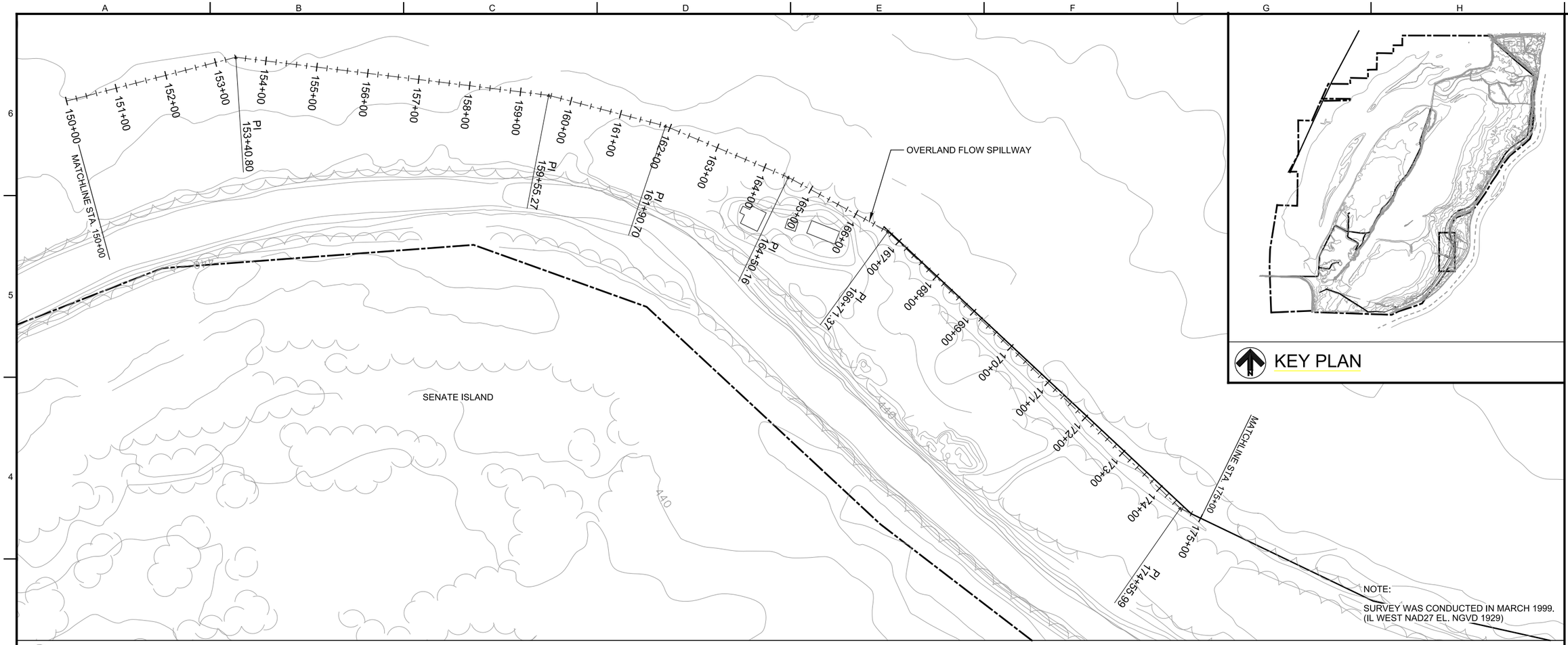
PLATE 12.dgn



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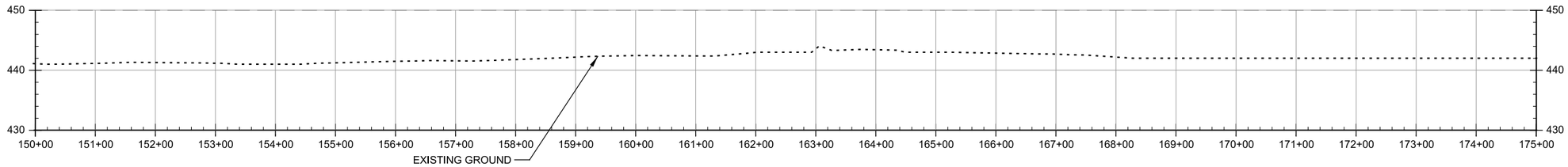
KEY PLAN



PROFILE STA. 150+00 TO STA. 175+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Dates:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY
PLAN AND PROFILE
STA. 150+00 TO 175+00

Sheet Reference Number:
PLATE 13
Sheet 13 of 35

35% REVIEW

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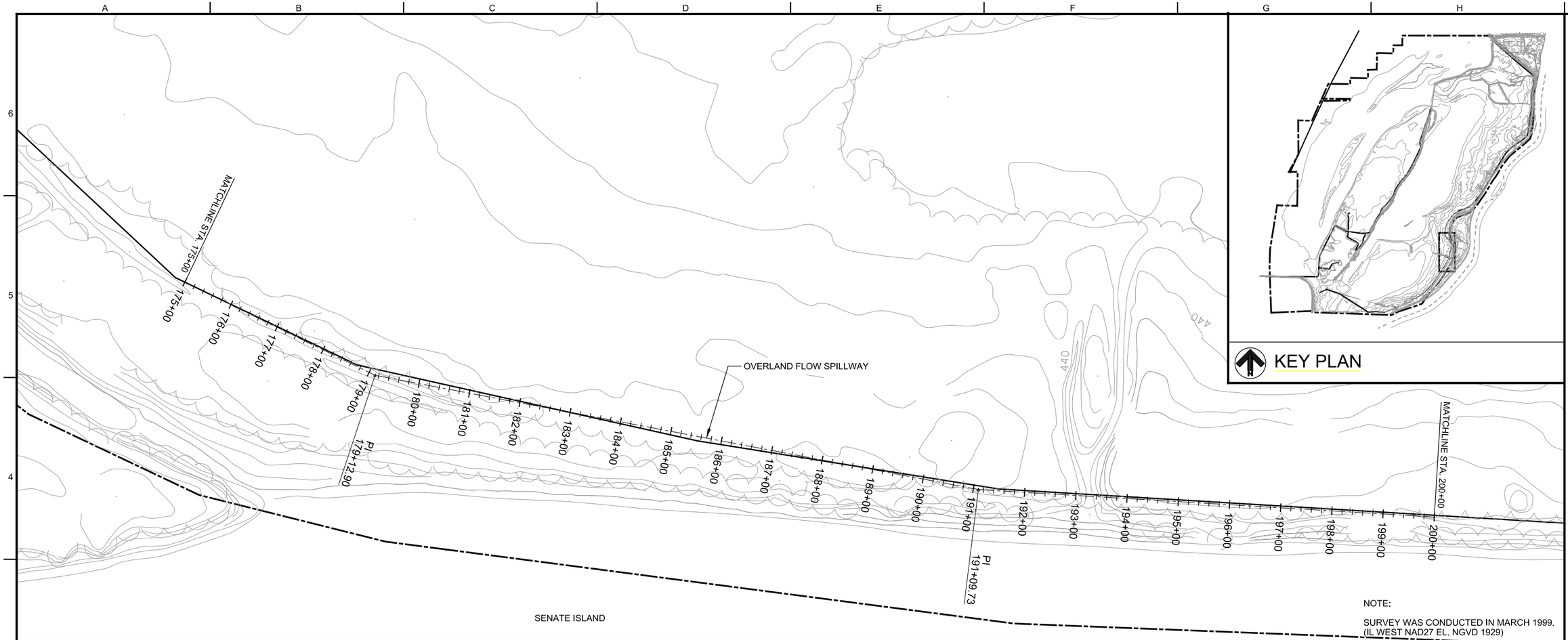
PLATE 13.dgn



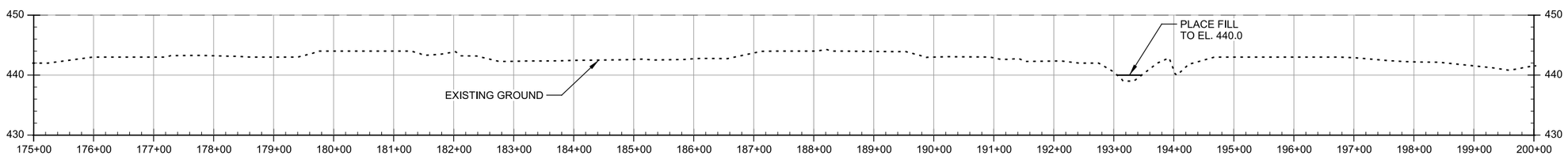
NOTE:

SURVEY WAS CONDUCTED IN MARCH 1999.
(IL WEST NAD27 EL. NGVD 1929)

100 0 100 200
SCALE IN FEET

KEY PLAN

PLAN



PROFILE STA. 175+00 TO STA. 200+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Designed By: RCF
Drawn By: LLH
Checked By:
Reviewed By: HLA
Date:
Scale: AS SHOWN
Project Code:
Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY
PLAN AND PROFILE
STA. 175+00 TO 200+00

Sheet Reference Number:
PLATE 14
Sheet 14 of 35

35% REVIEW

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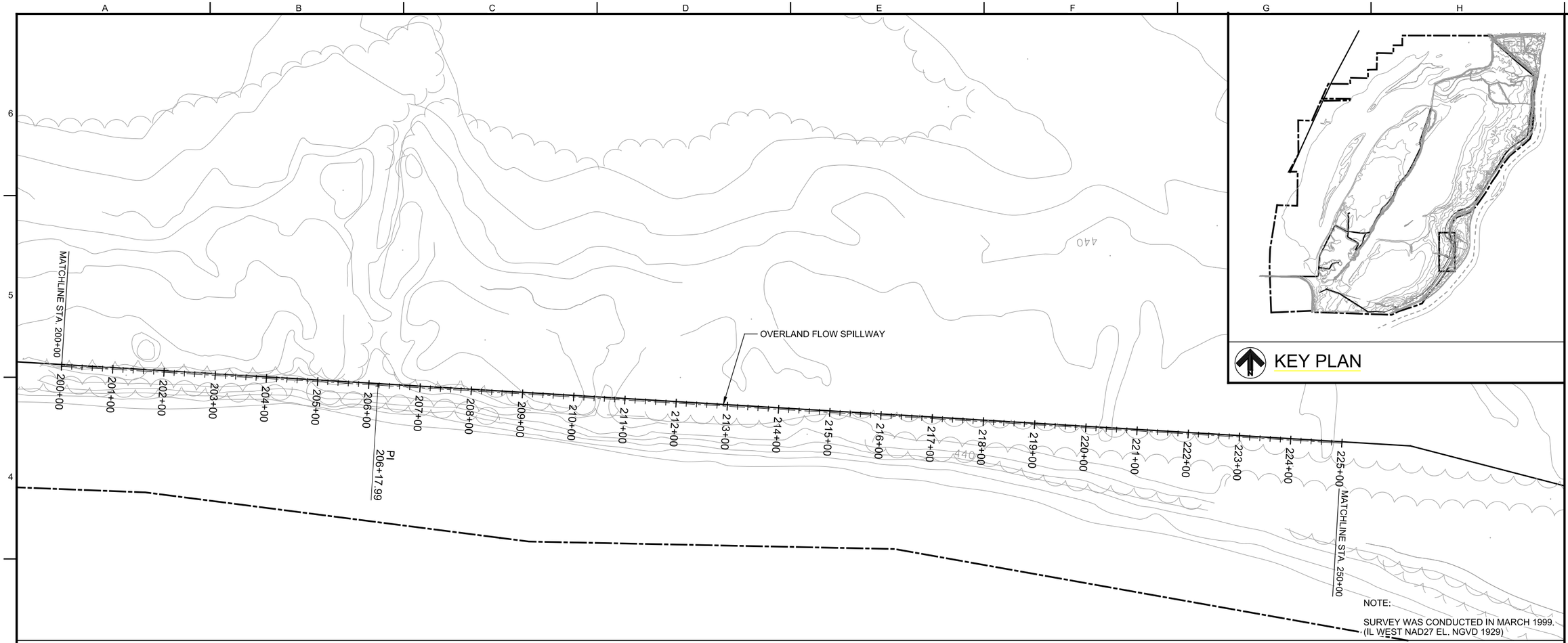
PLATE14.dgn



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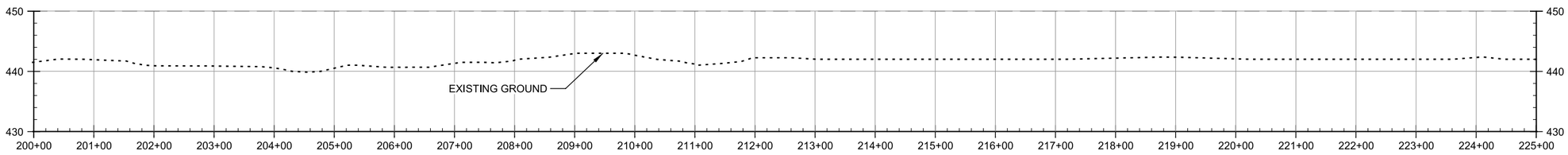

PROFILE STA. 200+00 TO STA. 225+00

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions			
Description	Date	Approved	

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY PLAN AND PROFILE STA. 200+00 TO 225+00

Sheet Reference Number:
PLATE 15
Sheet 15 of 35

35% REVIEW

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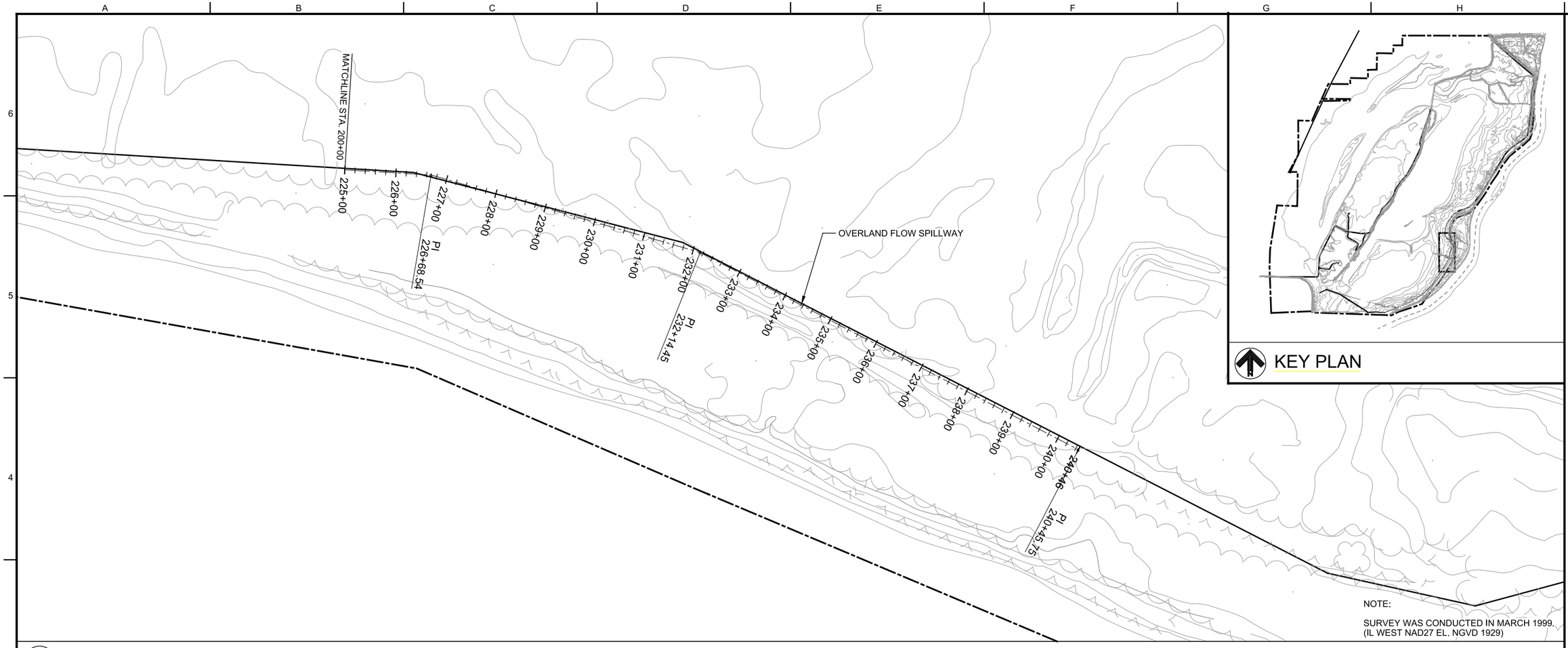
PLATE 15.dgn



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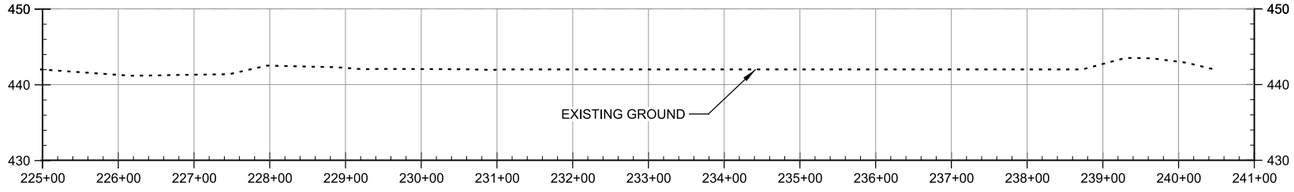


PROFILE STA. 225+00 TO STA. 240+46

NO SCALE

B5EDDEJJ
03-NOV-2010 10:26
PLATE16.dgn

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

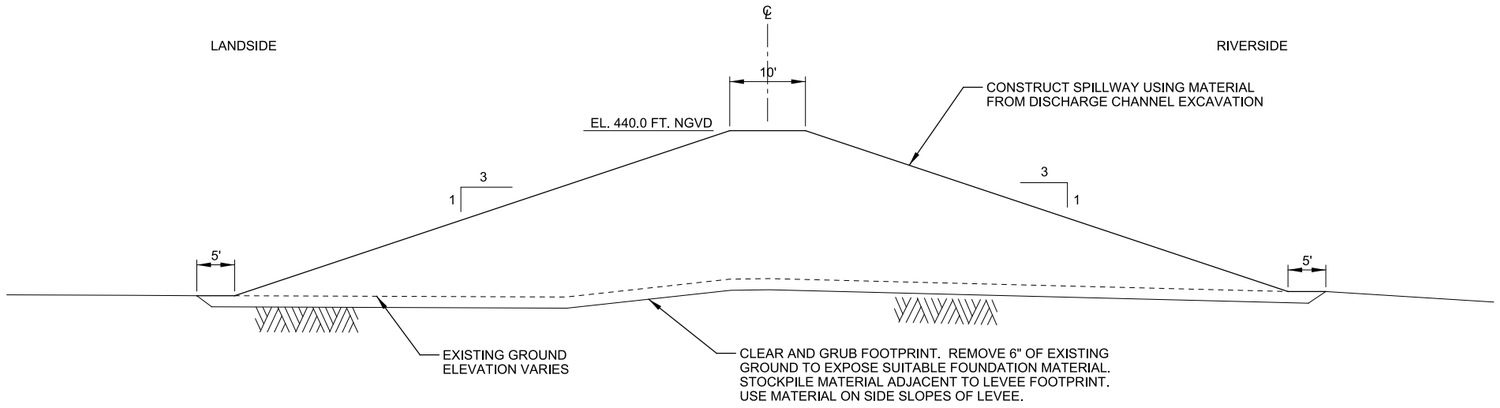
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

SPILLWAY
PLAN AND PROFILE
STA. 225+00 TO 240+46

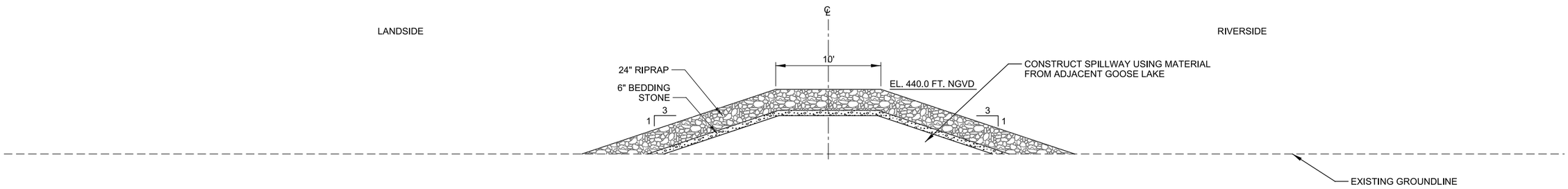
Sheet Reference Number:
PLATE 16
Sheet 16 of 35

35% REVIEW



TYPICAL SECTION - OVERFLOW SPILLWAY - STA. 0+00 TO STA.15+50 AND STA. 40+50 TO STA. 55+00

NO SCALE



TYPICAL SECTION - ARMORED OVERFLOW SPILLWAY - STA. 15+50 TO STA. 40+50

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions

Symbol	Description	Date	Approved

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION
& ENHANCEMENT PROJECT

SPILLWAY
TYPICAL SECTIONS

Sheet Reference Number:
PLATE 17
Sheet 17 of 35

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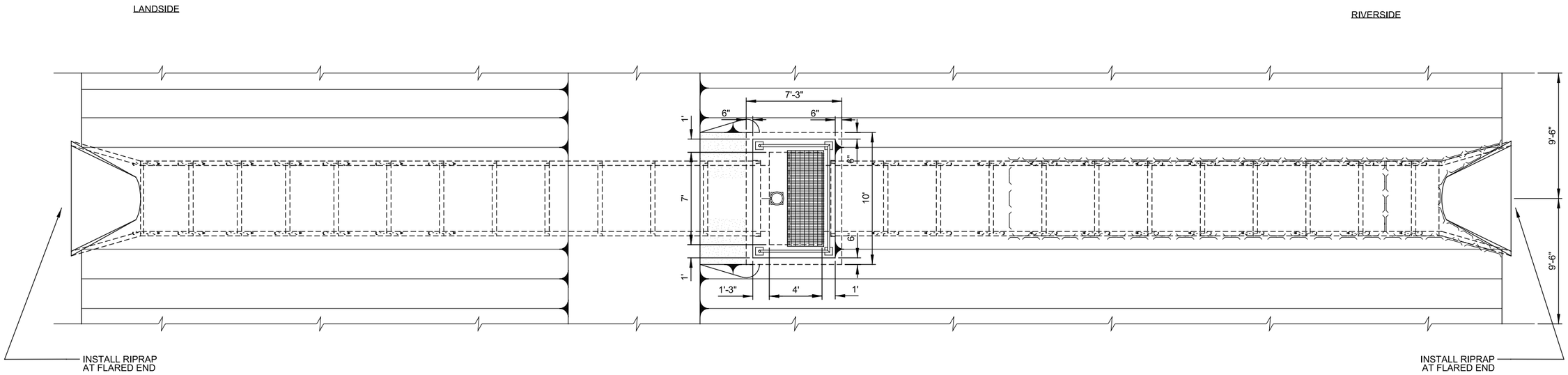
PLATE17.dgn

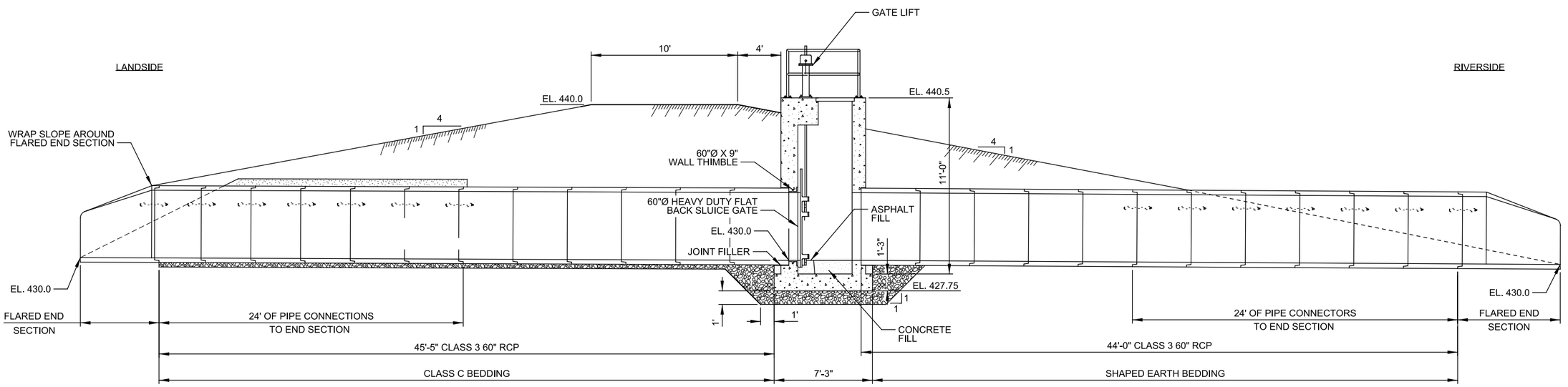
GATEWELL STRUCTURE PLAN

NO SCALE



GATEWELL STRUCTURE SECTION

NO SCALE



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Rock Island District

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ROCK ISLAND, ILLINOIS

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LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION
& ENHANCEMENT PROJECT

GATEWELL STRUCTURE PLAN AND SECTION

Sheet Reference Number:
PLATE 18
Sheet 18 of 35

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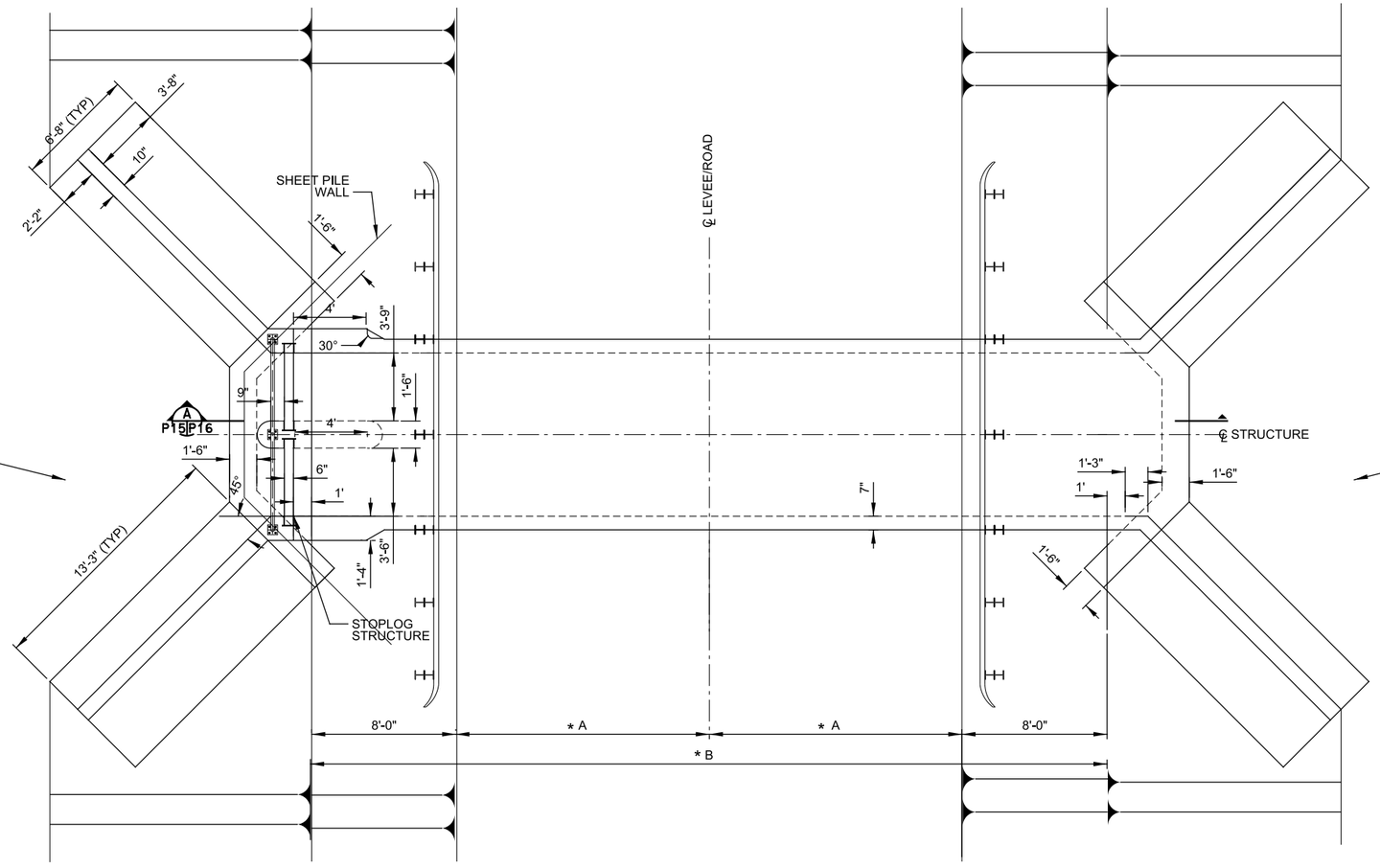
LANDSIDE

RIVERSIDE



*

LOCATION	DIMENSIONS	
	A	B
ROAD	13'11"	43'10"
LEVEE	5'0"	26'0"

FISH EGRESS STRUCTURE PLAN

4 0 4 8
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Date:
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Checked By:
Reviewed By: HLA

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ROCK ISLAND, ILLINOIS

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BANNER, IL
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FISH EGRESS STRUCTURE PLAN

Sheet Reference Number:
PLATE 19
Sheet 19 of 35

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PLATE19.dgn

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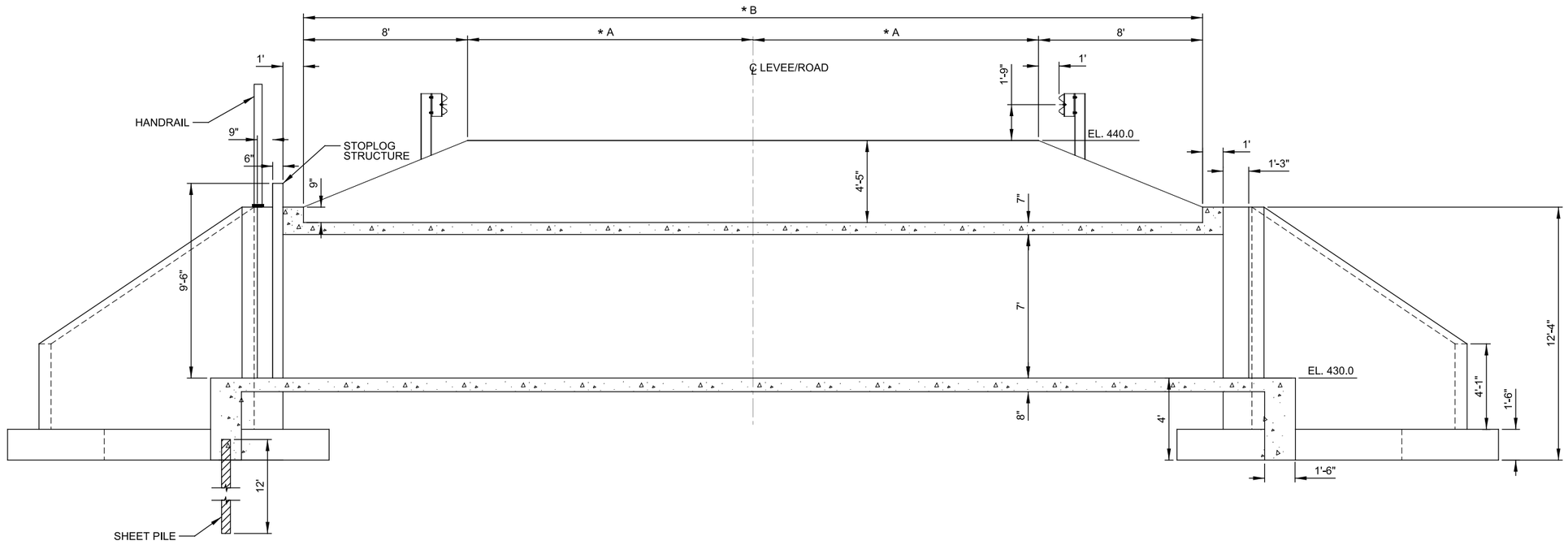
LANDSIDE

RIVERSIDE



*

LOCATION	DIMENSIONS	
	A	B
ROAD	13'11"	43'10"
LEVEE	5'0"	26'0"

FISH EGRESS STRUCTURE SECTION

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions

Symbol	Description	Date	Approved

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
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ROCK ISLAND, ILLINOIS

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LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

FISH EGRESS STRUCTURE SECTION

Sheet Reference Number:
PLATE 20
Sheet 20 of 35

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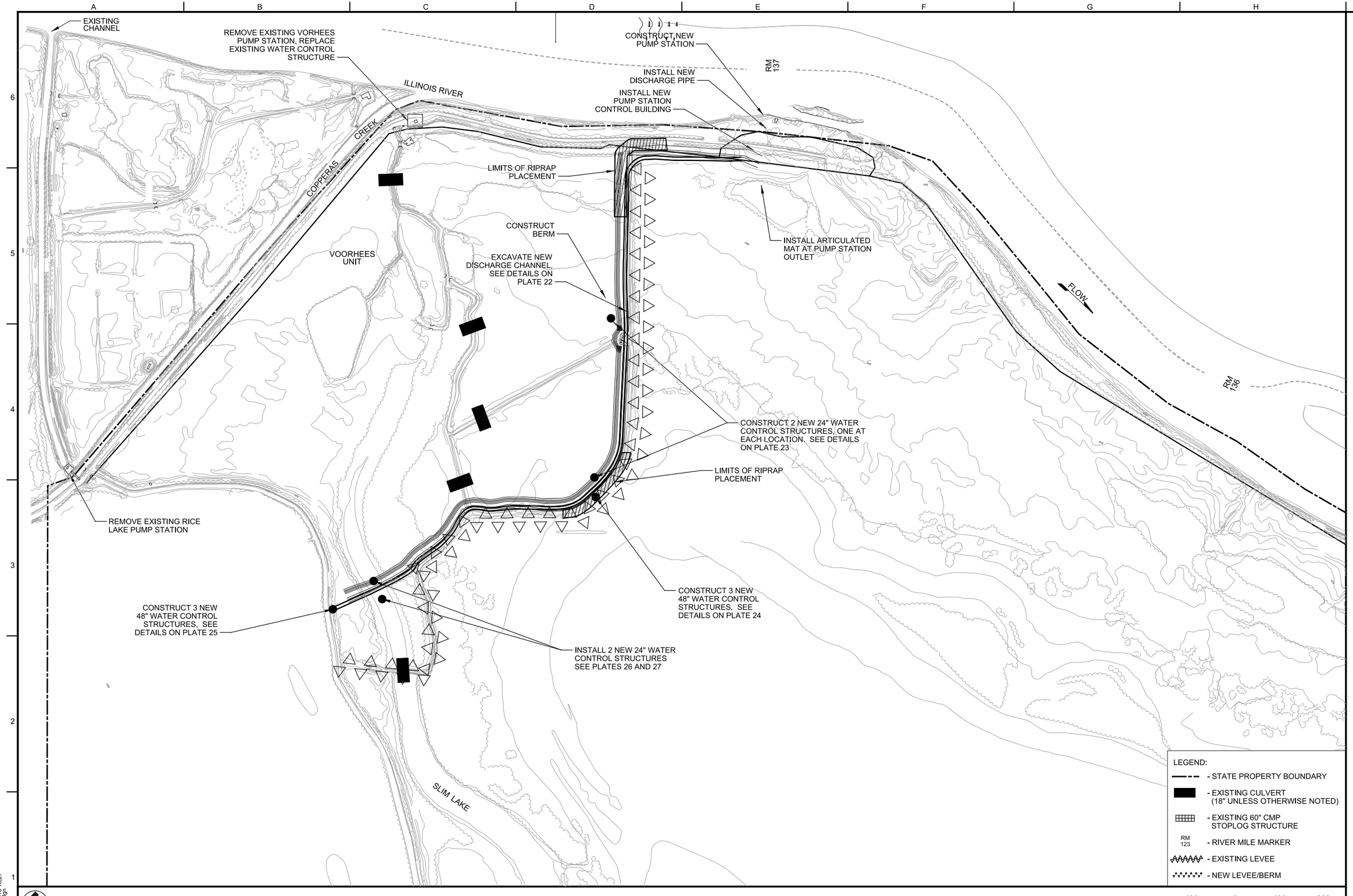

PUMP STATION DISCHARGE CHANNEL PLAN

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Date:		
Drawn By: LLH	Scale: AS SHOWN		
Checked By:	Project Code:		
Reviewed By: HLA	Solicitation Number:		

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CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

PUMP STATION DISCHARGE CHANNEL PLAN

Sheet Reference Number:
PLATE 21
Sheet 21 of 35

35% REVIEW

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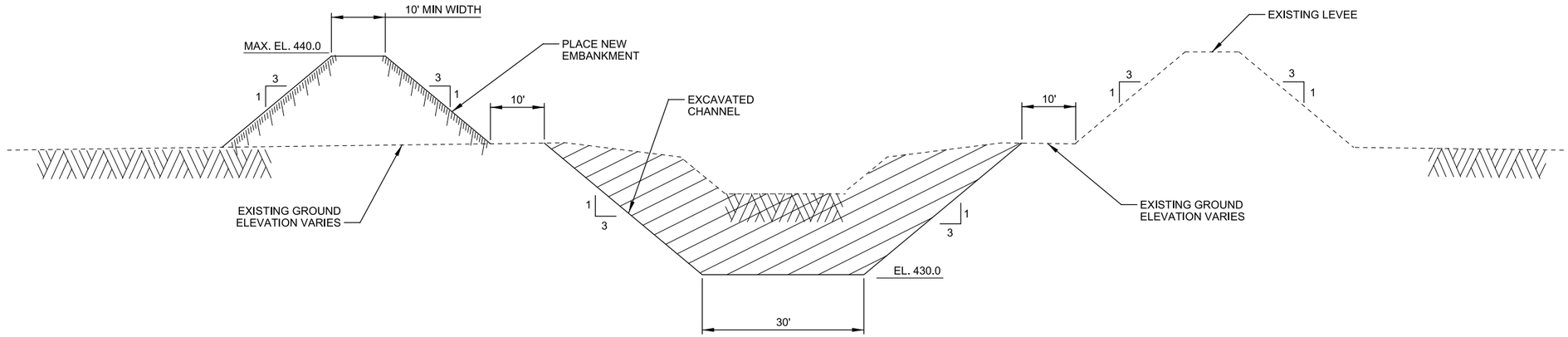

LEGEND:

- EXCAVATE
- FILL

TYPICAL DISCHARGE CHANNEL SECTION

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

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Checked By:	Project Code:		
Reviewed By: HLA	Solicitation Number:		

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ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

TYPICAL DISCHARGE CHANNEL SECTION

Sheet Reference Number:
PLATE 22
Sheet 22 of 35

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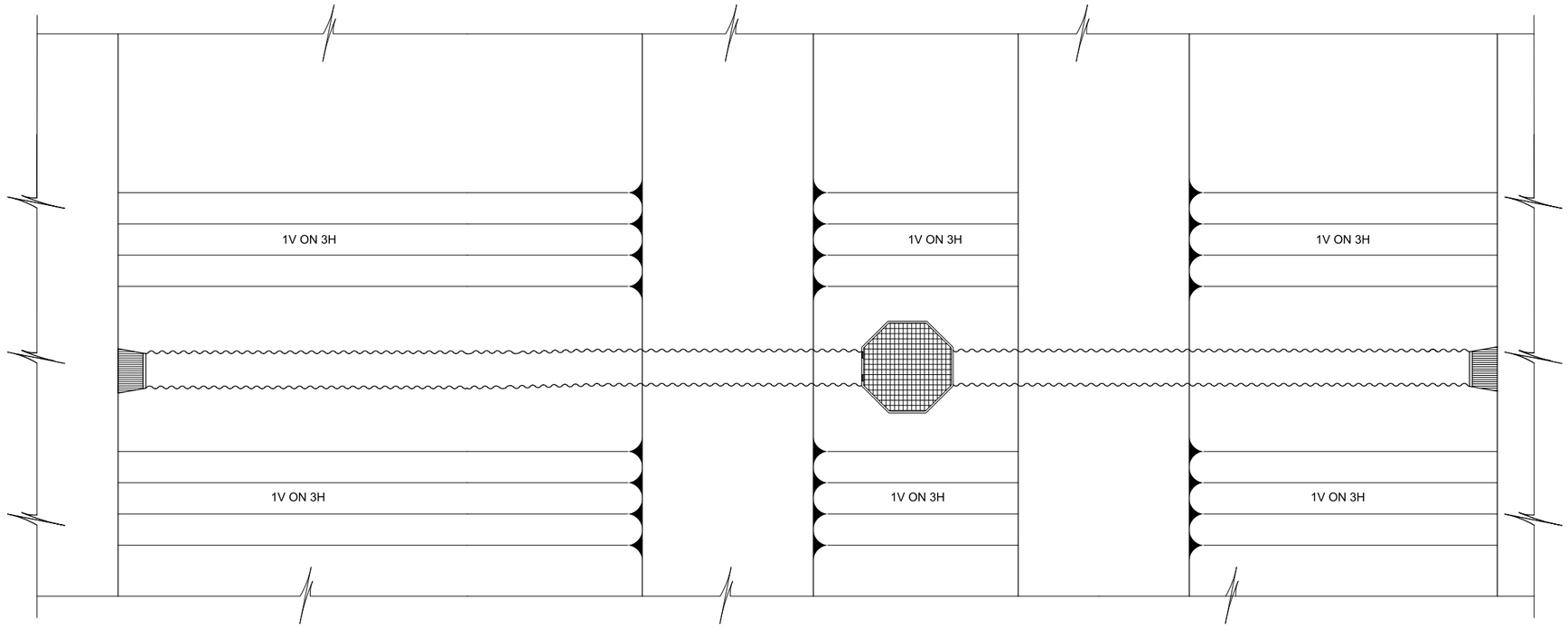
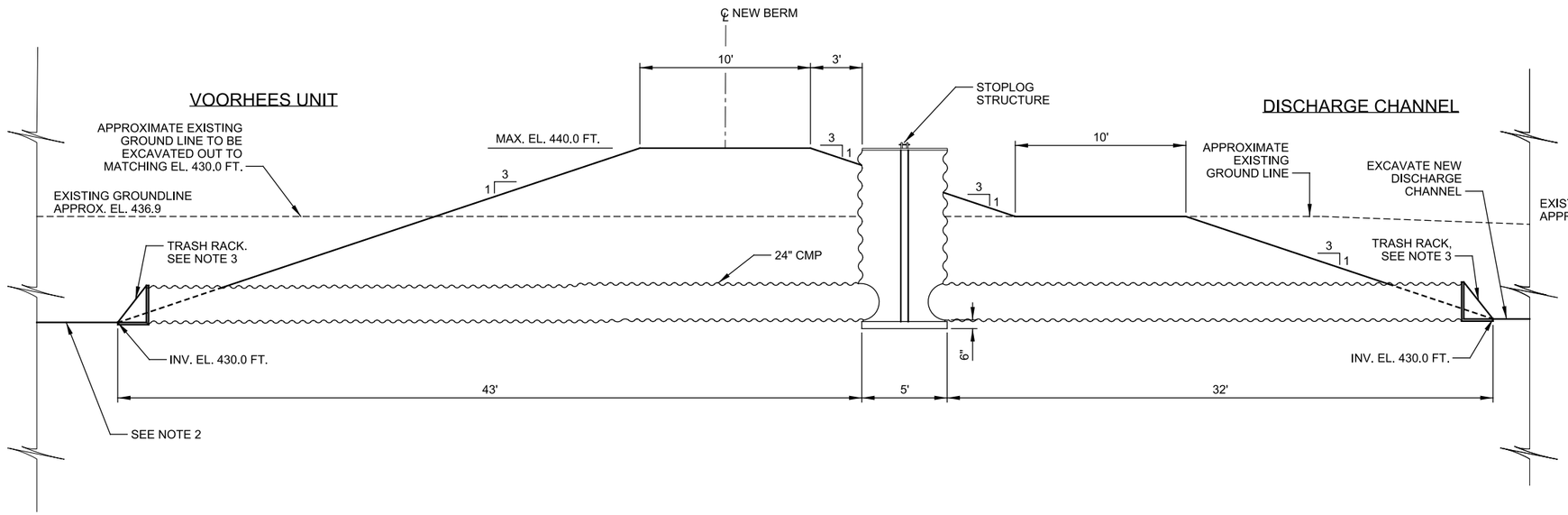
PLATE22.dgn



WATER CONTROL STRUCTURE VOORHEES UNIT PLAN

4 0 4 8
SCALE IN FEET



NOTES:

1. 24" CMP'S SHALL BE UNDERCUT BY HALF THEIR DIAMETER WHEN PLACED.
2. EXCAVATE NEW DITCH TO EL. 430.0 FT.. WITH A BOTTOM WIDTH OF 10' AND 1V ON 3H SIDE SLOPES FROM TRASH RACK TO EXISTING GROUND LINE EL. 430.0 FT. NGVD29 (APPROX. 300 FEET)
3. FOR TRASH RACK, PLACE ½" SOLID BAR VERTICALLY AND WELD IN PLACE.

WATER CONTROL STRUCTURE VOORHEES UNIT SECTION

4 0 4 8
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
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U.S. ARMY ENGINEER DISTRICT
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ROCK ISLAND, ILLINOIS

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LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

WATER CONTROL STRUCTURE VOORHES UNIT PLAN & SECTION

Sheet Reference Number:
PLATE 23
Sheet 23 of 35

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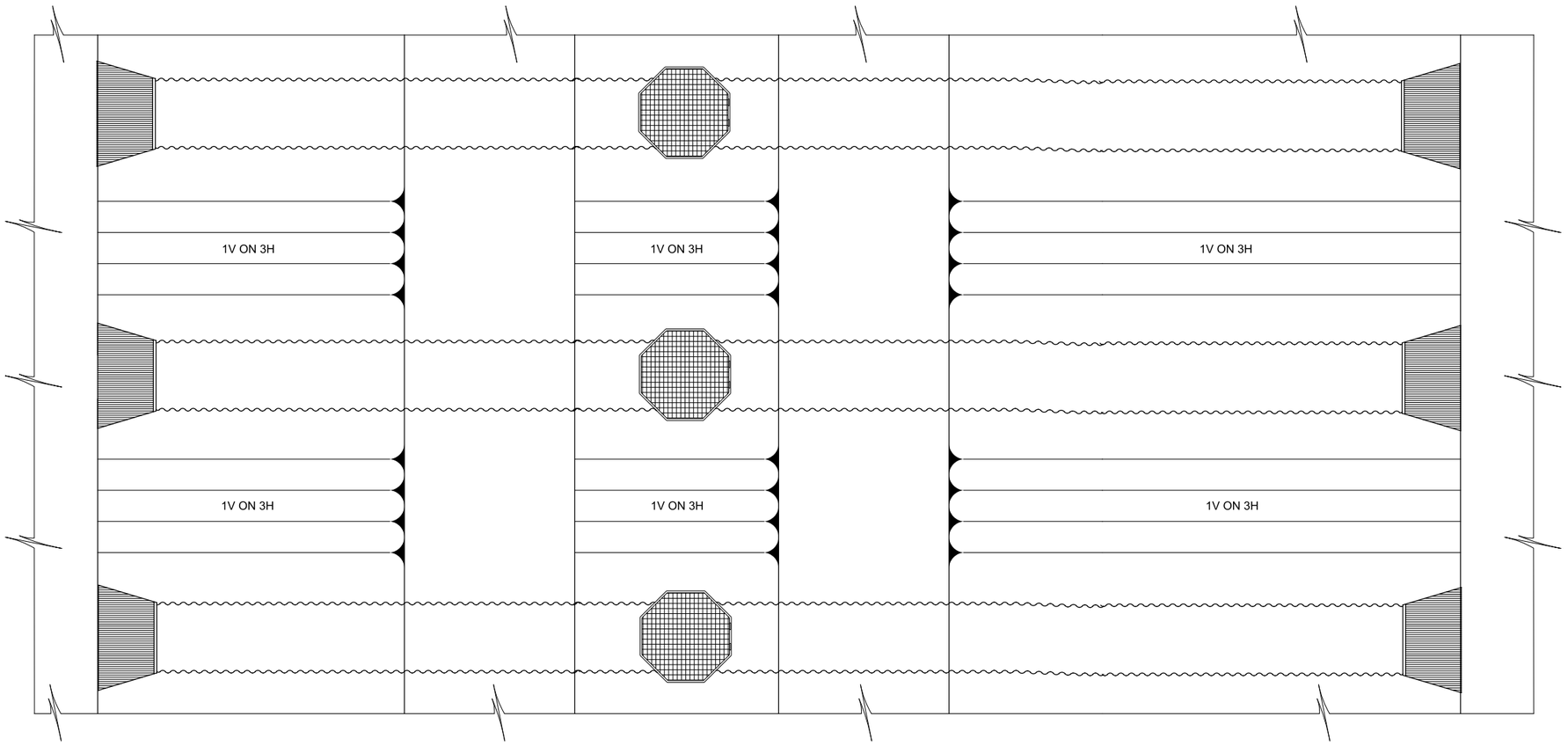
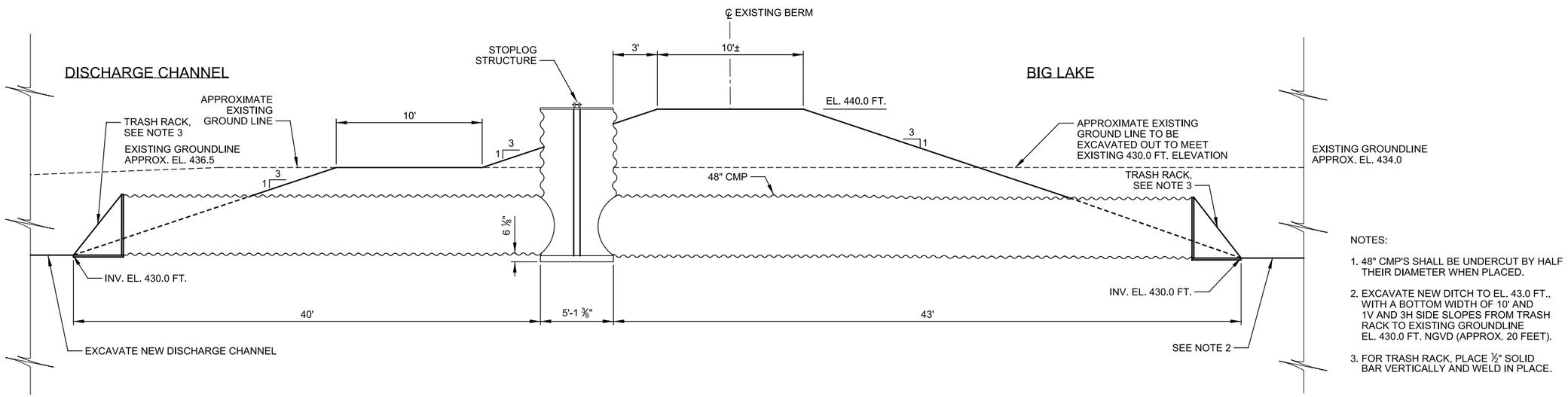
PLATE23.dgn



WATER CONTROL STRUCTURE BIG LAKE PLAN

SCALE IN FEET 4 0 4 8



NOTES:

1. 48" CMP'S SHALL BE UNDERCUT BY HALF THEIR DIAMETER WHEN PLACED.
2. EXCAVATE NEW DITCH TO EL. 43.0 FT., WITH A BOTTOM WIDTH OF 10' AND 1V AND 3H SIDE SLOPES FROM TRASH RACK TO EXISTING GROUNDLINE EL. 430.0 FT. NGVD (APPROX. 20 FEET).
3. FOR TRASH RACK, PLACE ½" SOLID BAR VERTICALLY AND WELD IN PLACE.

WATER CONTROL STRUCTURE BIG LAKE SECTION

SCALE IN FEET 4 0 4 8

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved

Revisions

Designed By: RCF	Date:		
Drawn By: LLH	Scale: AS SHOWN		
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Reviewed By: HLA	Solicitation Number:		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

WATER CONTROL STRUCTURE BIG LAKE PLAN & SECTION

Sheet Reference Number:
PLATE 24
Sheet 24 of 35

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PLATE24.dgn

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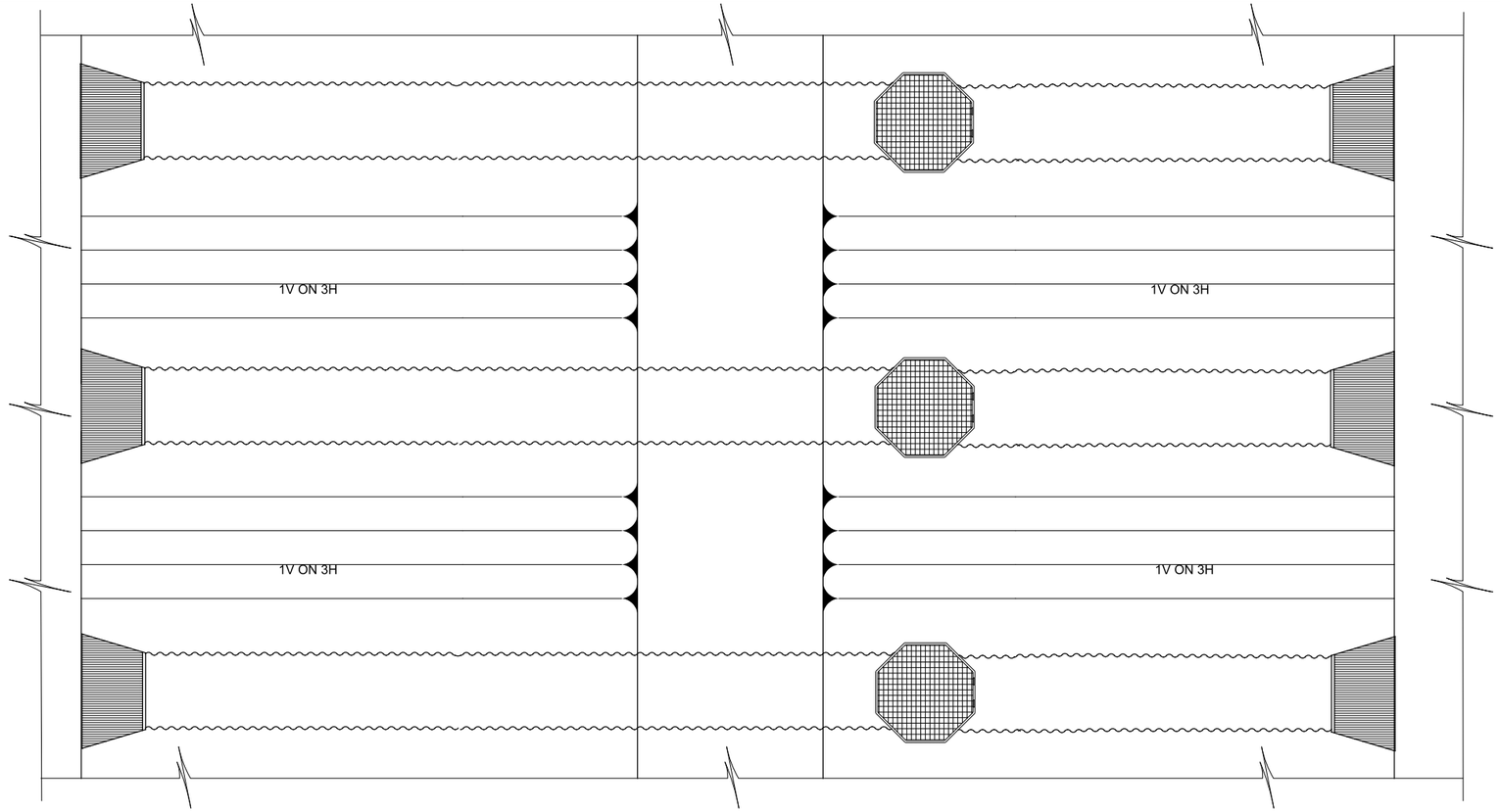
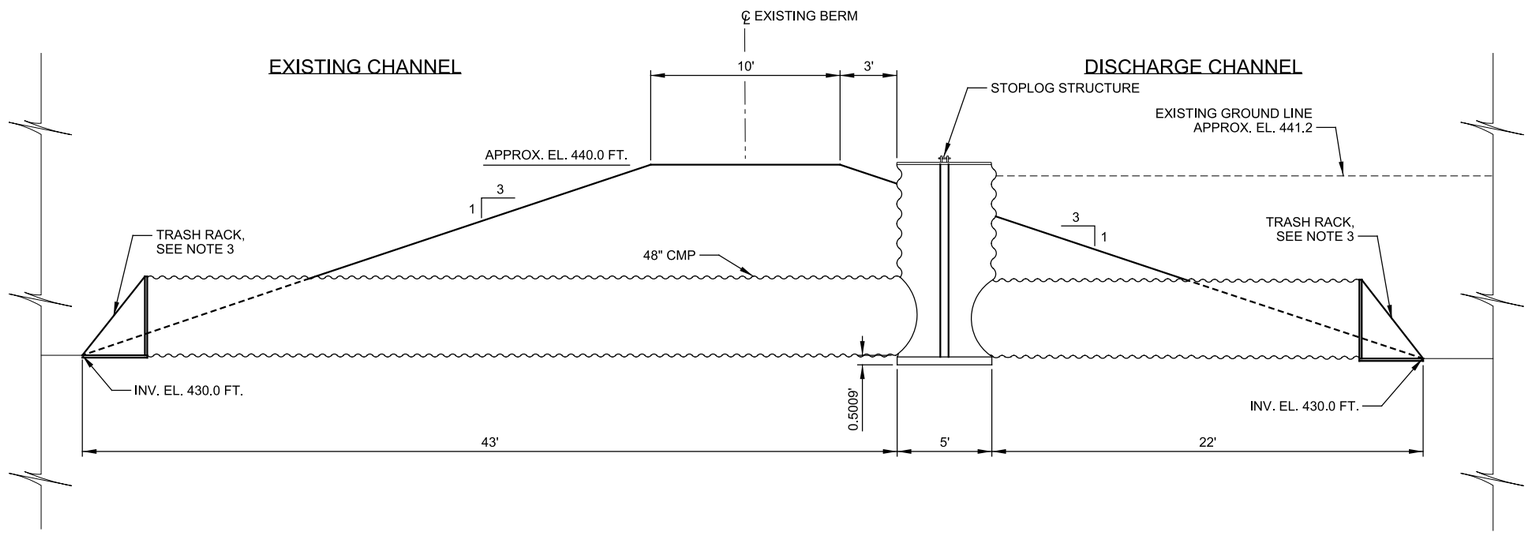


WATER CONTROL STRUCTURE RICE LAKE PLAN

4 0 4 8
SCALE IN FEET



NOTES:

1. 48" CMP'S SHALL BE UNDERCUT BY HALF THEIR DIAMETER WHEN PLACED.
2. EXCAVATE NEW DITCH TO EL. 430.0 FT. WITH A BOTTOM WIDTH OF 10' AND 1V ON 3H SIDE SLOPES FROM TRASH RACK TO EXISTING GROUND LINE EL. 430.0 FT. NGVD (APPROX. 300 FEET).
3. FOR TRASH RACK. PLACE ½" SOLID BAR VERTICALLY AND WELD IN PLACE.

WATER CONTROL STRUCTURE RICE LAKE SECTION

4 0 4 8
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

WATER CONTROL STRUCTURE RICE LAKE PLAN & SECTION

Sheet Reference Number:
PLATE 25
Sheet 25 of 35

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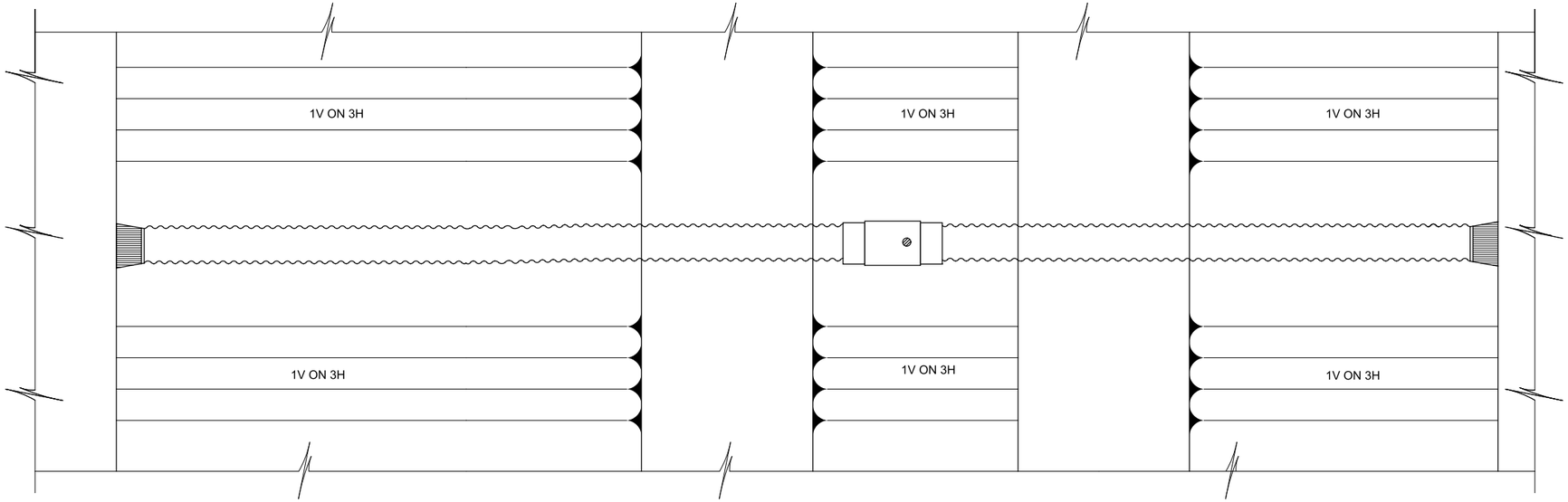
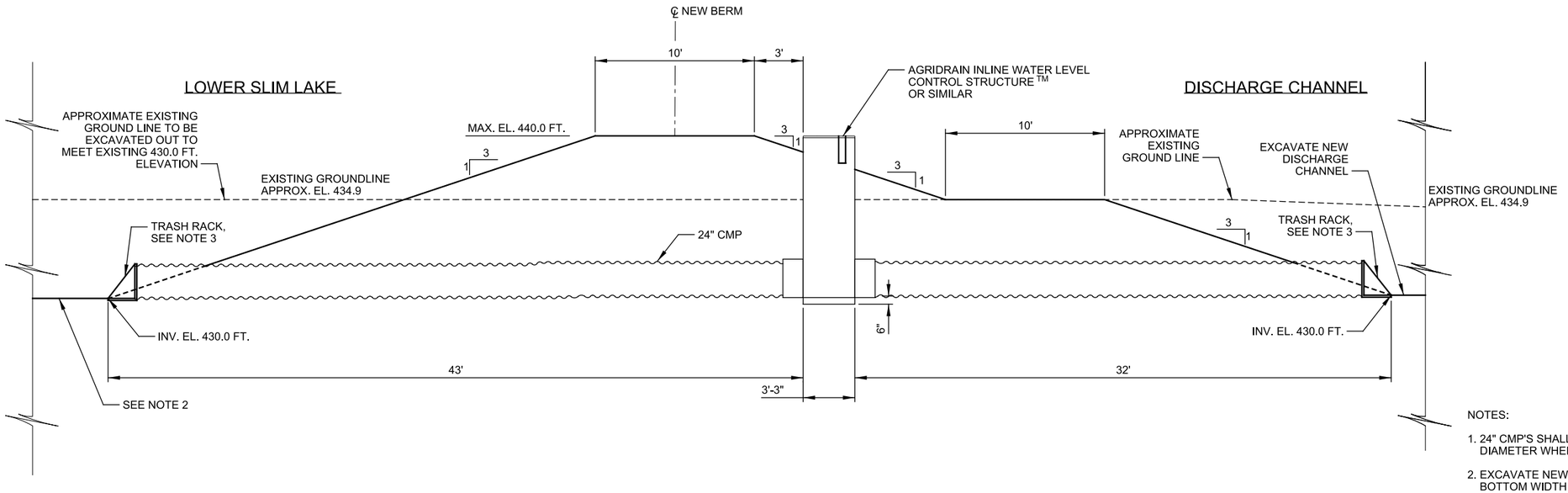
PLATE25.dgn



WATER CONTROL STRUCTURE LOWER SLIM PLAN

4 0 4 8
SCALE IN FEET



NOTES:

1. 24" CMP'S SHALL BE UNDERCUT BY HALF THEIR DIAMETER WHEN PLACED.
2. EXCAVATE NEW DITCH TO EL. 430.0 FT., WITH A BOTTOM WIDTH OF 10' AND 1V ON 3H SIDE SLOPES FROM TRASH RACK TO EXISTING GROUND LINE EL. 430.0 FT. NGVD (APPROX. 300 FEET).
3. FOR TRASH RACK, PLACE ½" SOLID BAR VERTICALLY AND WELD IN PLACE.

WATER CONTROL STRUCTURE LOWER SLIM SECTION

4 0 4 8
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

Revisions

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Designed By: RCF	Dates:		
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Reviewed By: HLA	Solicitation Number:		

U.S. ARMY ENGINEER DISTRICT
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ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

WATER CONTROL STRUCTURE LOWER SLIM PLAN & SECTION

Sheet Reference Number:
PLATE 26
Sheet 26 of 35

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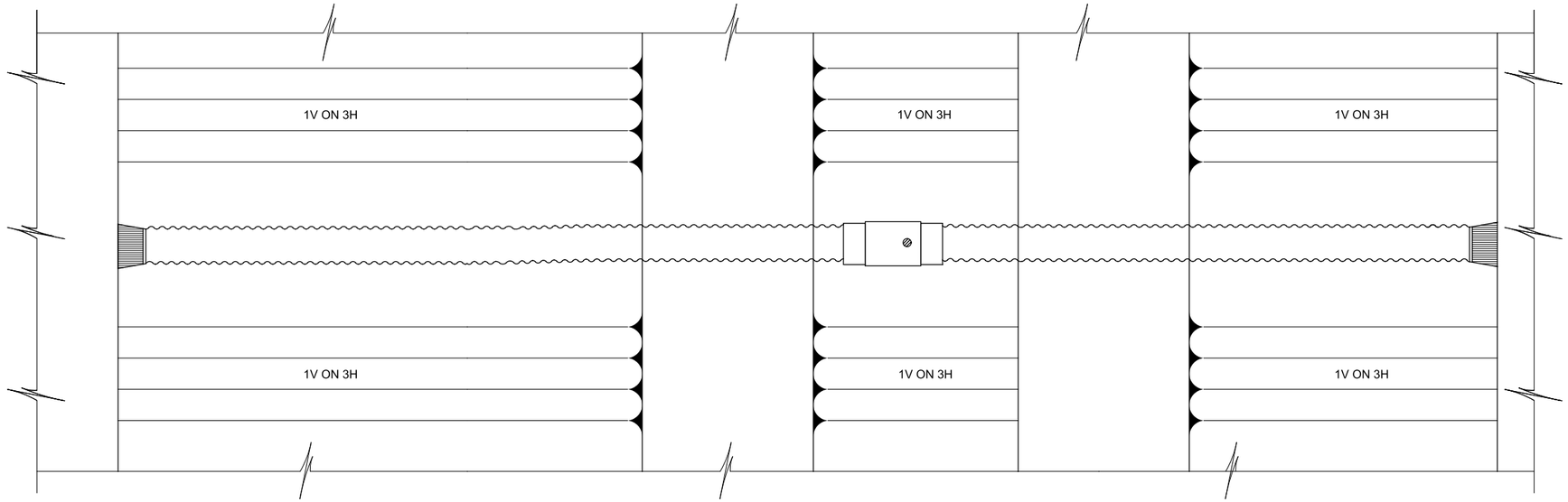
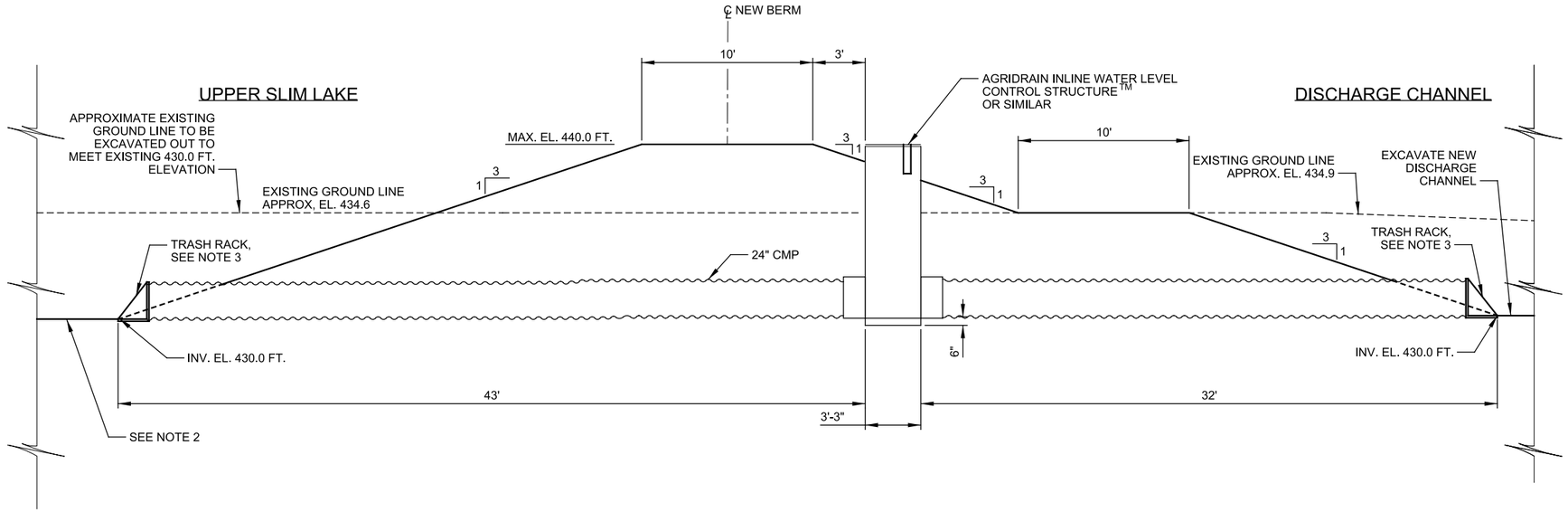


WATER CONTROL STRUCTURE UPPER SLIM PLAN

4 0 4 8
SCALE IN FEET



NOTES:

1. 24" CMP'S SHALL BE UNDERCUT BY HALF THEIR DIAMETER WHEN PLACED.
2. EXCAVATE NEW DITCH TO EL. 430.0 FT., WITH A BOTTOM WIDTH OF 10' AND 1V ON 3H SIDE SLOPES FROM TRASH RACK TO EXISTING GROUND LINE EL. 430.0 FT. NGVD (APPROX. 300 FEET).
3. FOR TRASH RACK, PLACE ½" SOLID BAR VERTICALLY AND WELD IN PLACE.

WATER CONTROL STRUCTURE UPPER SLIM PLAN AND SECTION

4 0 4 8
SCALE IN FEET

US Army Corps of Engineers ®
Rock Island District

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	Revisions		

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ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

WATER CONTROL STRUCTURE UPPER SLIM PLAN & SECTION

Sheet Reference Number:
PLATE 27
Sheet 27 of 35

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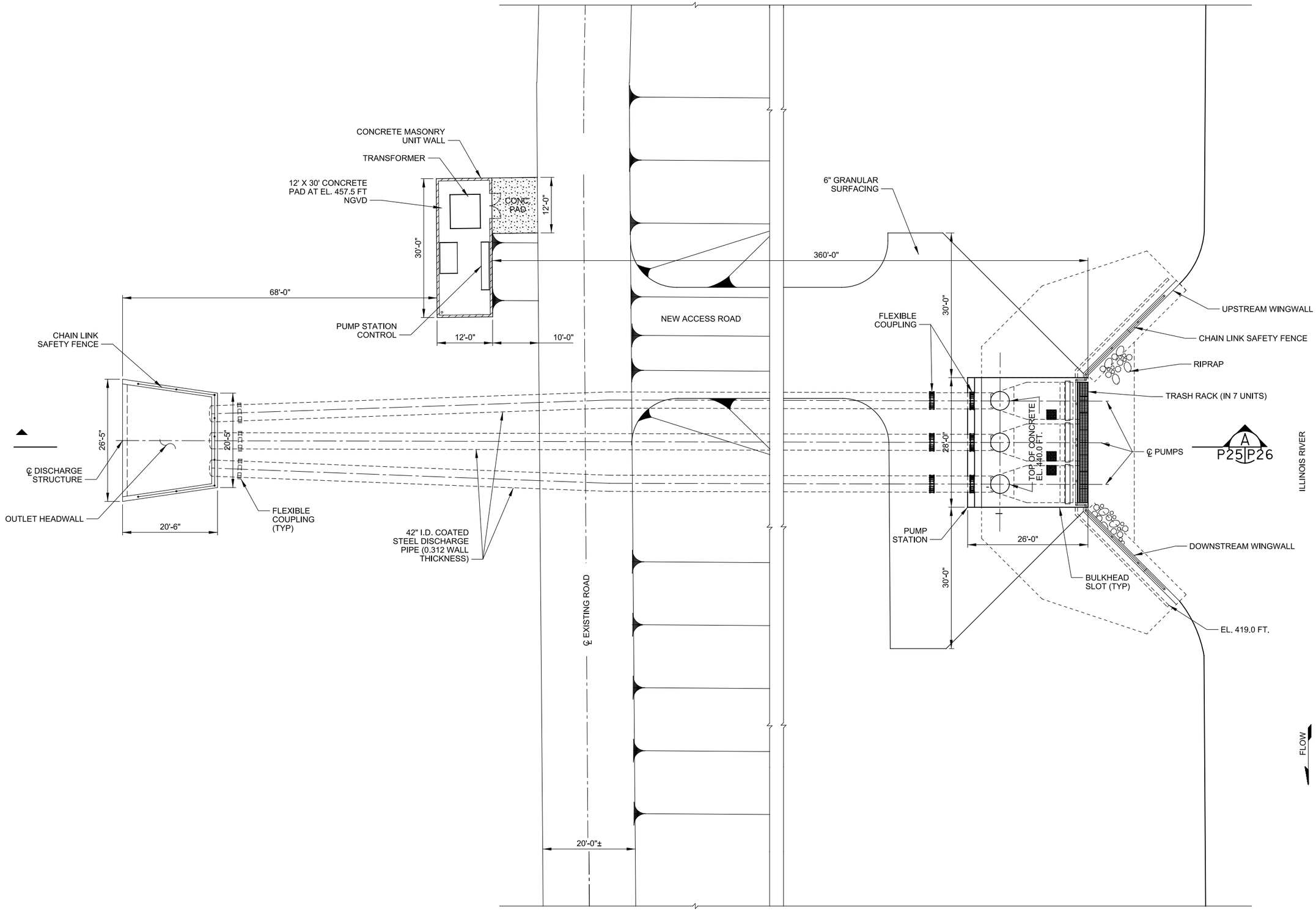

PUMP STATION SITE PLAN

SCALE IN FEET 10 0 10 20

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03-NOV-2010 10:28
PLATE28.dgn

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Dates:
Scale: AS SHOWN
Project Code:
Solicitation Number:

Designed By: RCF
Drawn By: LLH
Checked By:
Reviewed By: HLA

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

PUMP STATION SITE PLAN

Sheet Reference Number:
PLATE 28
Sheet 28 of 35

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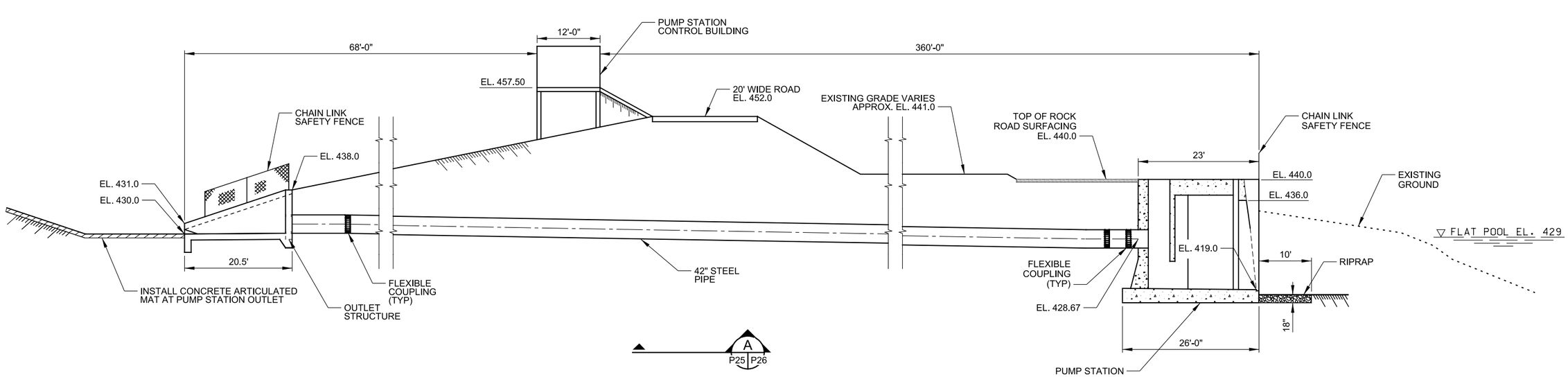

PUMP STATION SECTION A

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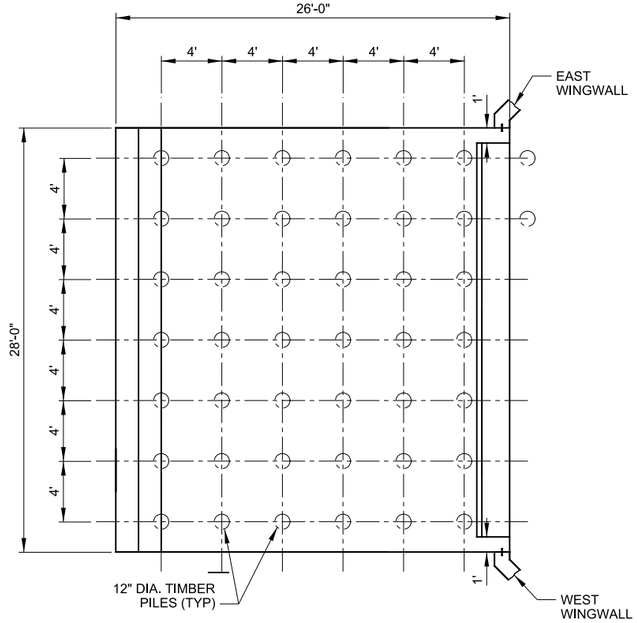

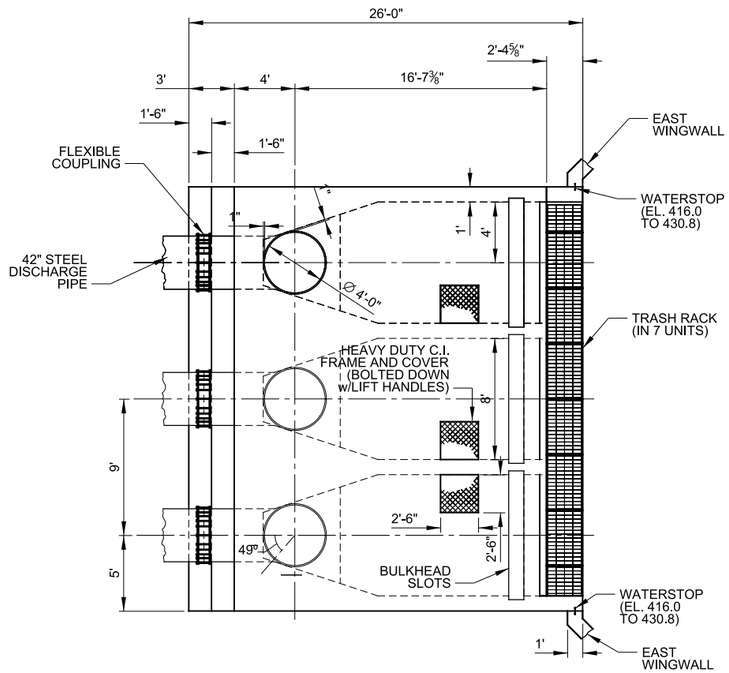

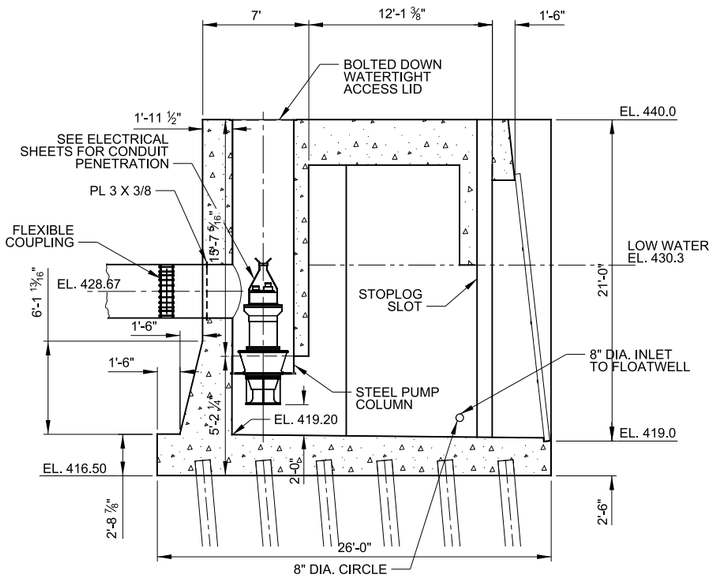

PUMP STATION ELEVATIONS AND DETAIL

SCALE IN FEET: 4 0 4 8

US Army Corps of Engineers ®
Rock Island District

Revisions			
Symbol	Description	Date	Approved

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION
& ENHANCEMENT PROJECT

PUMP STATION ELEVATIONS AND DETAILS

Sheet Reference Number:
PLATE 29
Sheet 29 of 35

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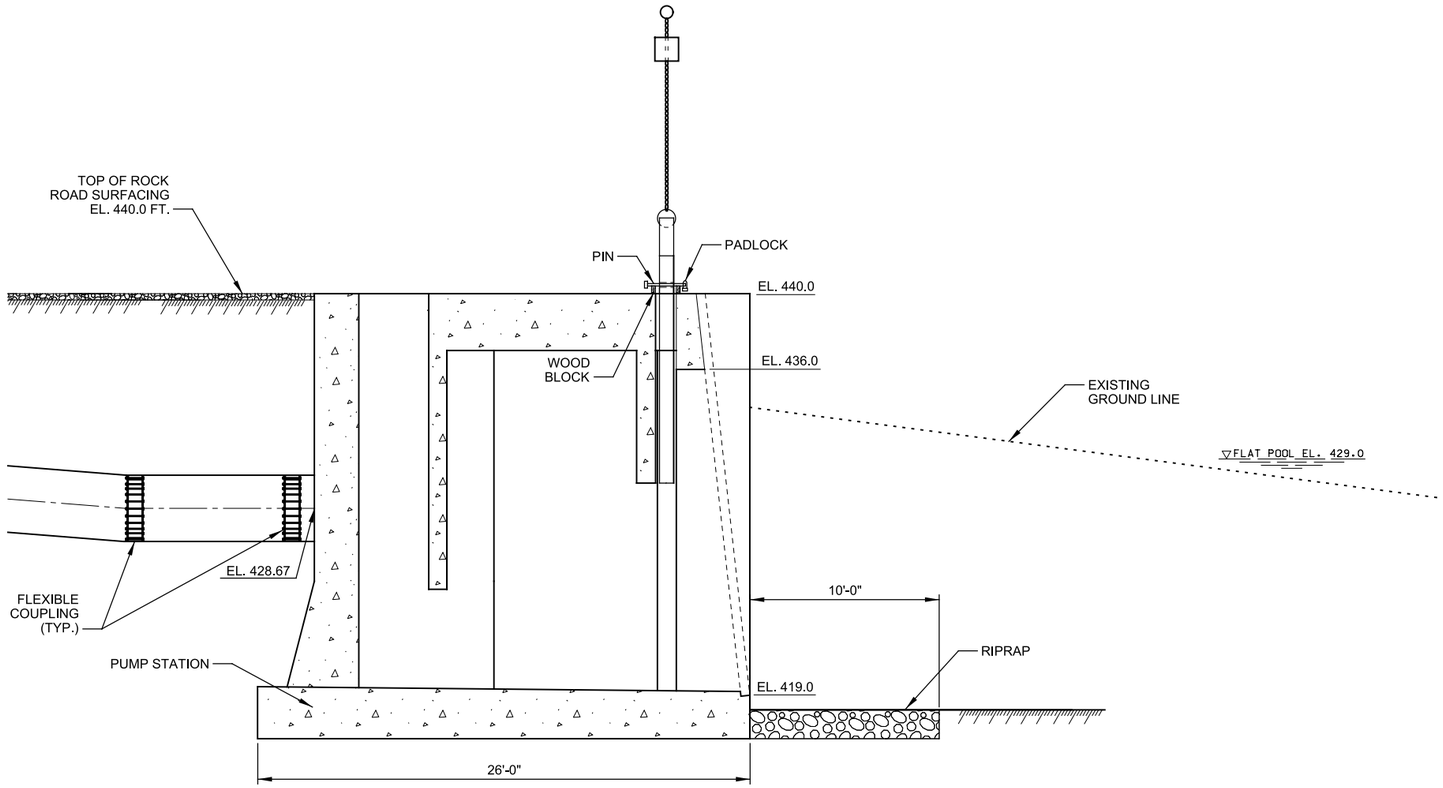
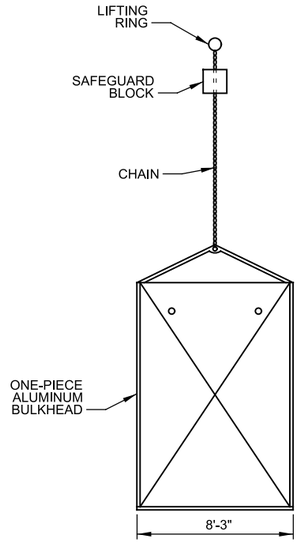
PLATE29.dgn



PUMP STATION BULKHEAD DETAIL

4 0 4 8
SCALE IN FEET



ALUMINUM BULKHEAD

4 0 4 8
SCALE IN FEET

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PLATE30.dgn

US Army Corps of Engineers ®
Rock Island District

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Designed By: RCF	Date:		
Drawn By: LLH	Scale: AS SHOWN		Solicitation Number:
Checked By:	Project Code:		
Reviewed By: HLA			

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

PUMP STATION BULKHEAD DETAILS

Sheet Reference Number:
PLATE 30
Sheet 30 of 35

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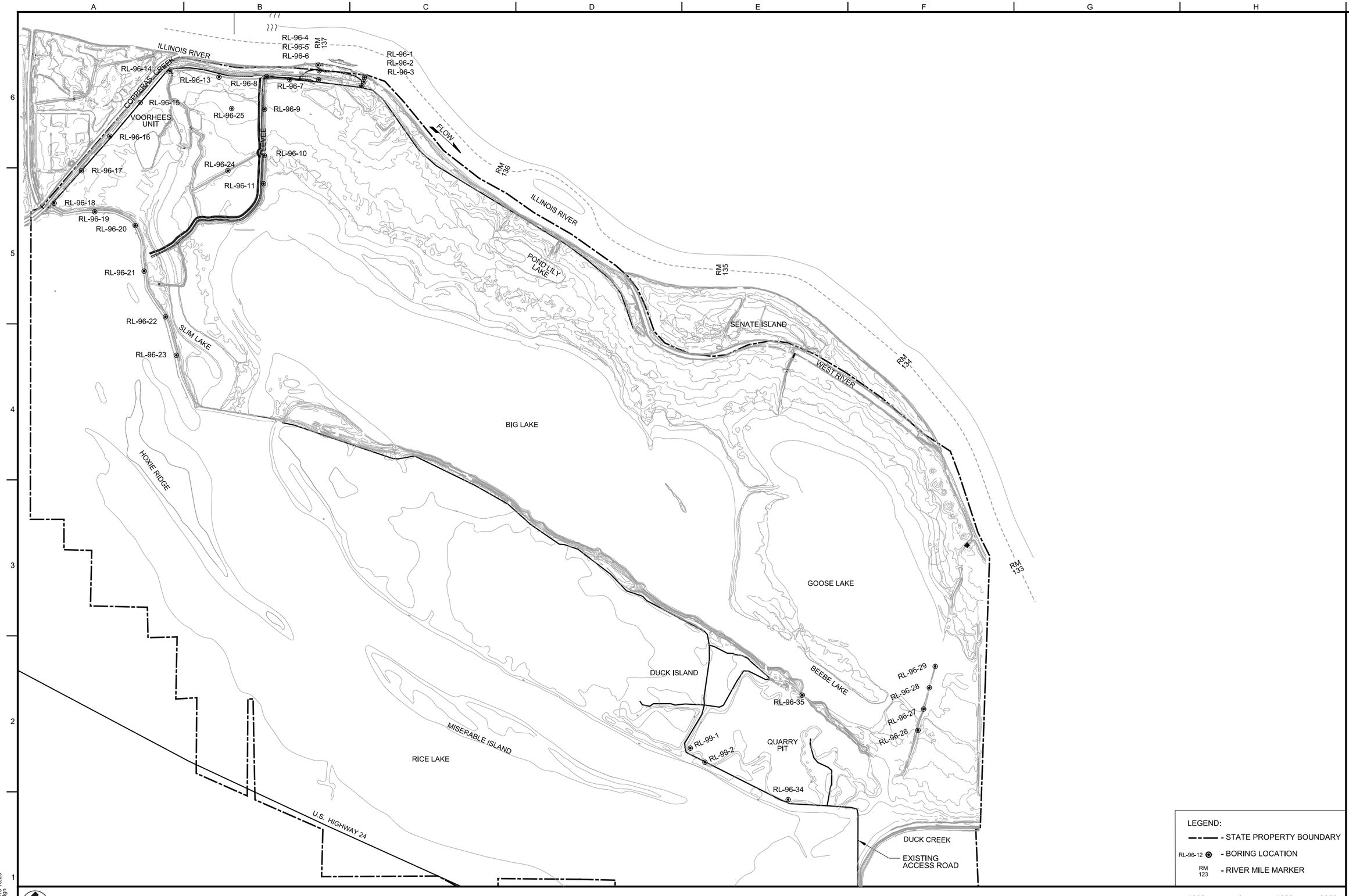

US Army Corps of Engineers ®
Rock Island District

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Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

BORING LOCATIONS

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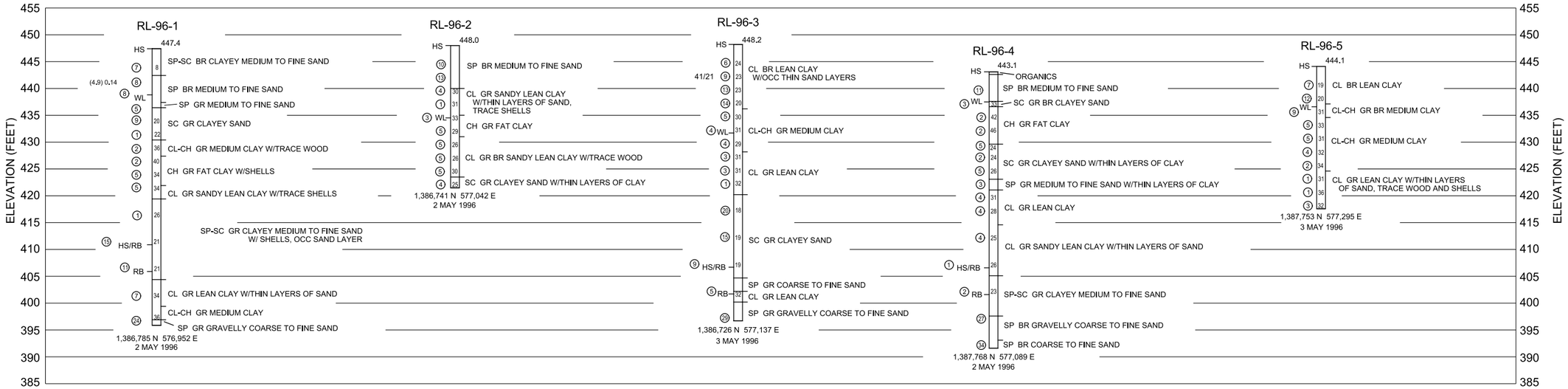
PLATE31.dgn

35% REVIEW



BORING LOGS I

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions

Symbol	Description	Date	Approved

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Dates:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS WATERWAY
LAGRANGE POOL
BANNER, IL
RICE LAKE HABITAT REHABILITATION & ENHANCEMENT PROJECT

BORING LOGS I

Sheet Reference Number:
PLATE 32
Sheet 32 of 35

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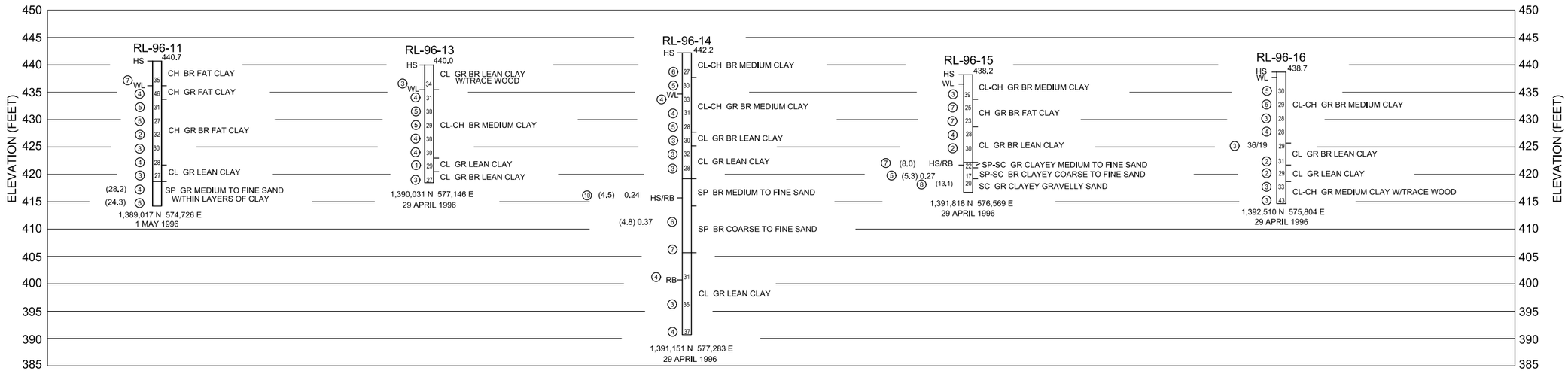
PLATE32.dgn

35% REVIEW



NOTE:
1. FOR LEGEND SEE PLATE 29.

BORING LOGS II

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Revisions

Symbol	Description	Date	Approved

Date:
Scale: AS SHOWN
Project Code:
Solicitation Number:
Designed By: RCF
Drawn By: LLH
Checked By:
Reviewed By: HLA

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

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LAGRANGE POOL
BANNER, IL
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BORING LOGS II

Sheet Reference Number:
PLATE 33
Sheet 33 of 35

35% REVIEW

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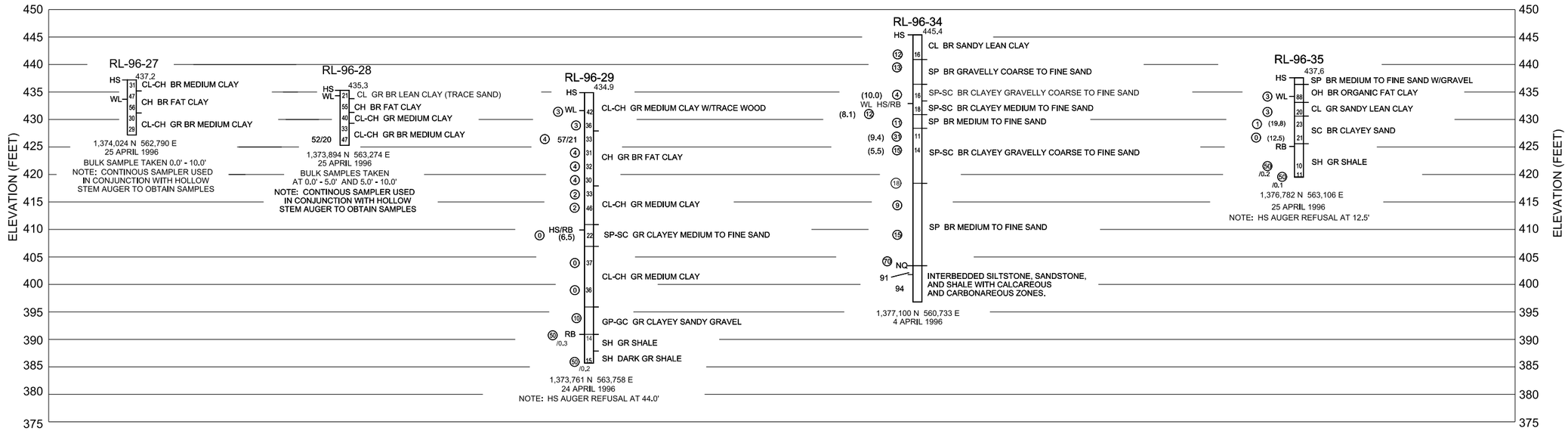
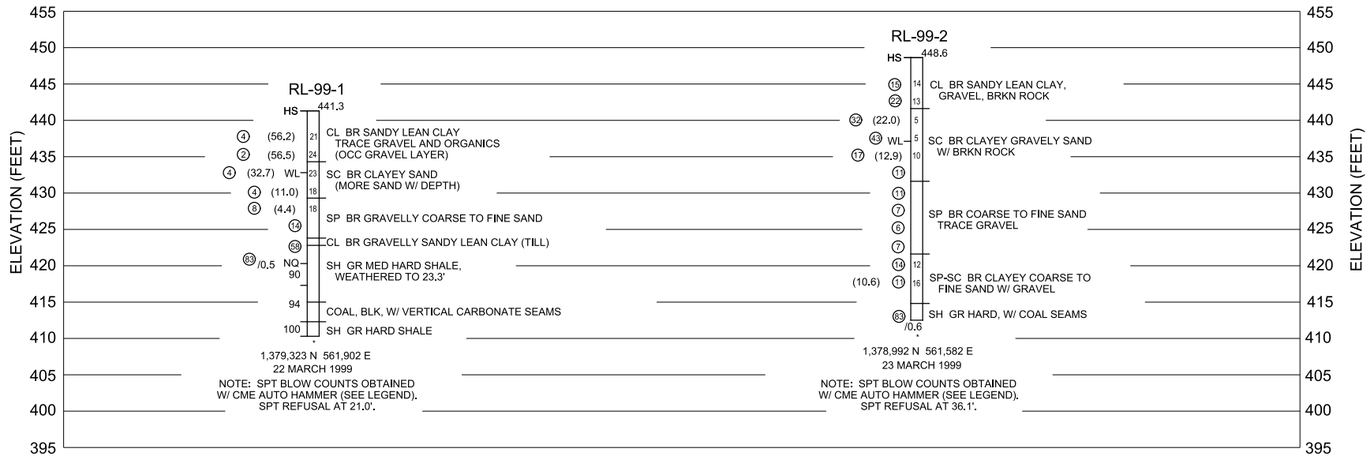
PLATE33.dgn





NOTE:
1. FOR LEGEND SEE PLATE 29.

BORING LOGS III

NO SCALE

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: RCF	Drawn By: LLH	Checked By:	Reviewed By: HLA
Date:	Scale: AS SHOWN	Project Code:	Solicitation Number:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

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BORING LOGS III

Sheet Reference Number:
PLATE 34
Sheet 34 of 35

35% REVIEW

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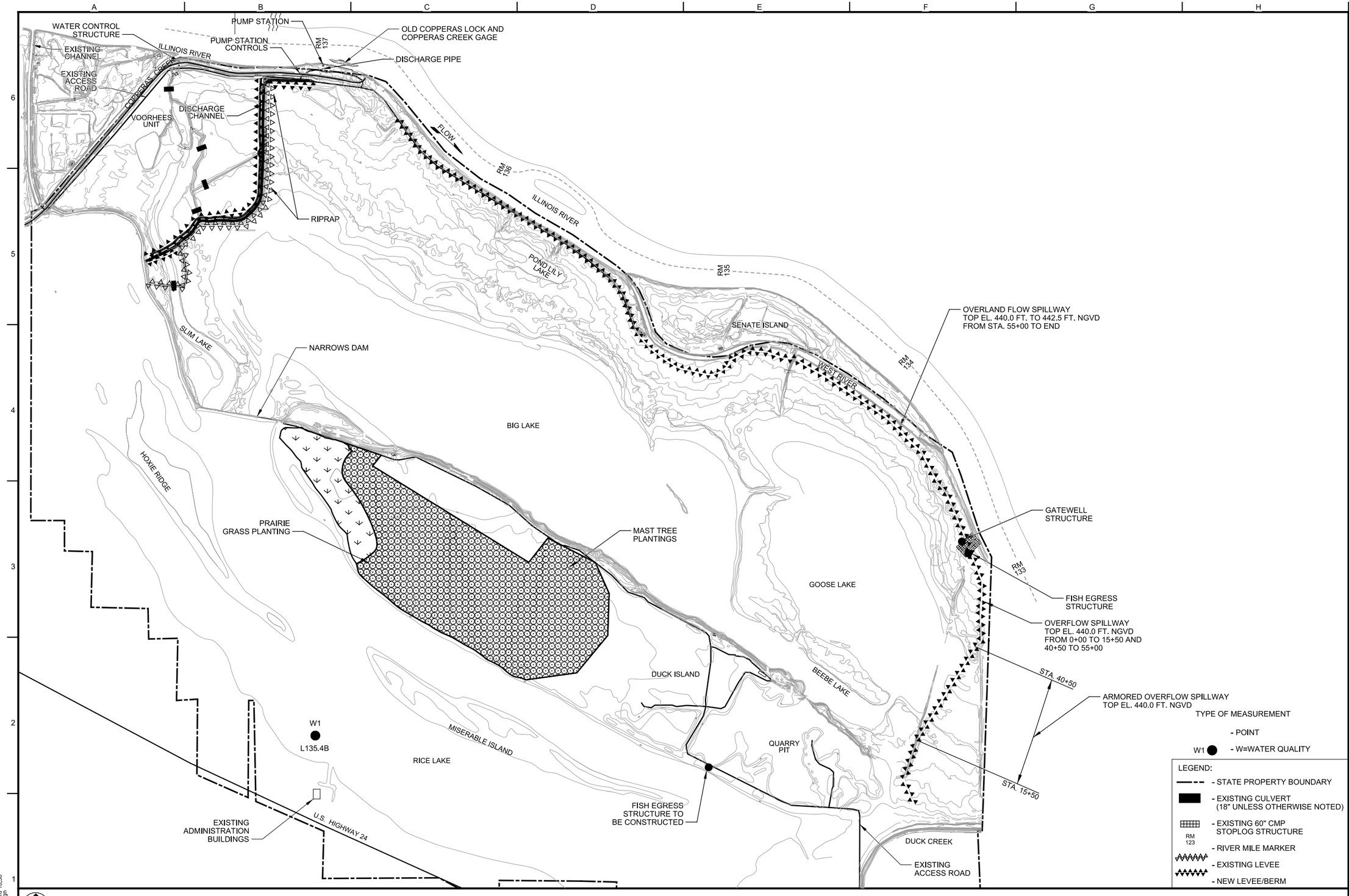
PLATE34.dgn



POST-PROJECT MONITORING PLAN

US Army Corps of Engineers ®
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By:	RCF	Date:	
Drawn By:	LLH	Scale:	AS SHOWN
Checked By:		Project Code:	
Reviewed By:	HLA	Station Number:	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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POST CONSTRUCTION MONITORING PLAN

Sheet Reference Number:
PLATE 35
Sheet 35 of 35

35% REVIEW

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