US Army Corps
of Engineers
St. Paul District

UPPER MISSISSIPPI RIVER SYSTEM

ENVIRONMENTAL MANAGEMENT PROGRAM

OPERATION AND MAINTENANCE MANUAL

POOL 9 ISLAND

HABITAT REHABILITATION AND ENHANCEMENT PROJECT

POOL 9
UPPER MISSISSIPPI RIVER
CRAWFORD COUNTY, WISCONSIN

JUNE 1996

PREFACE

The Pool 9 Island Habitat Rehabilitation and Enhancement Project was constructed by the Corps of Engineers. In accordance with Section 107(b) of the Water Resources Development Act of 1992, the U.S. Fish and Wildlife Service has the responsibility for operation and maintenance. The Corps of Engineers has prepared this manual to assist in fulfilling the operation and maintenance tasks.

The manual and appendices contain the latest approved agreements, maps, drawings, tables, and references pertinent to operation and maintenance of this project. The project as designed and constructed will improve waterfowl and fish habitat in lower pool 9, located at about river mile 655.5 on the Wisconsin side of the Upper Mississippi River navigation channel. However, continued successful functioning of the project will depend upon the manner in which the project is maintained. Careful inspection and proper maintenance can help accomplish that goal.

The planning, design, and construction of the project was the result of an extensive cooperative effort on the part of the involved Federal and State agencies and the public. The continuation of this cooperation and coordination as part of the operation and maintenance of the project will be important to the success of the project and is strongly recommended.

DEPARTMENT OF THE ARMY
St. Paul District, Corps of Engineers
190 Fifth Street East
St. Paul, Minnesota 55101-1638

UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM

POOL 9 ISLAND
POOL 9, UPPER MISSISSIPPI RIVER
CRAWFORD COUNTY, WISCONSIN

OPERATION AND MAINTENANCE MANUAL

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INTRODUCTION

This manual has been prepared to serve as a guide for the operation and maintenance of the Pool 9 Island Habitat Rehabilitation and Enhancement Project in Crawford County, Wisconsin. Operation and maintenance instructions for the major features of the project are presented. These instructions are consistent with the general procedures found in the Pool 9 Island Construction Supplemental Definite Project Report dated July 1993.

There are no structures that need to be operated for the project. The intent of the maintenance instructions is to present preventive maintenance information consisting of systematic inspections and subsequent corrective actions to ensure long-term use of project features. A timely maintenance program prevents major damage to constructed features by early corrective action.

For ease in use, this manual is divided into two sections.

Part I. This section describes the project features and provides background information on the project.

Part II. This section gives details on the operation and maintenance of the project.

PART I - PROJECT FEATURES AND HISTORY

LOCATION

The Pool 9 Island project area is located in pool 9 of the Upper Mississippi River at Crawford City, Wisconsin, approximately 7.5 miles above Lock and Dam 9 and 8 miles below Lansing, IA, at river mile 655.5. Pool 9 is about 2 miles wide at this location and, with the exception of the navigation channel and scattered sloughs and depressions, consists of shallow open water ranging in depth from less than one foot to 5 feet. The project lies within the Upper Mississippi River National Wildlife and Fish Refuge. Project drawings (appendix A) show the location of the Pool 9 Island and project features.

AUTHORIZATION

The Pool 9 Island project was authorized under the provisions of the 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662).

Because the Pool 9 Island project is located on Federal lands managed as a National Wildlife Refuge, operation and maintenance are to be carried out in compliance with Section 107(b) of the 1992 Water Resources Development Act.

DESCRIPTION OF PROJECT

Islands in the lake-like lower reaches of pool 9 had eroded and lost over 95-percent of their landmass in the last 50 years because of wind- and boat-generated wave action. Loss of these islands permited suspended sediment from the main river channel and shallow backwater areas of Lake Winneshiek to routinely enter the project area. Wave action uprooted aquatic vegetation and resuspended the sediment in the shallow backwater area, resulting in loss of existing growth and reduced light penetration that diminishes aquatic plant growth. The loss of the islands was causing the aquatic plant beds to diminish and sedimentation was filling the backwater area.

The project involved the construction of a C-shaped rockfill island complex with a 5-foot top width at 1 foot above normal pool elevation. The island complex parallels the main channel for 3,000 feet and extends into the backwater about 1,600 feet at the upper end and 1,900 feet at the lower end. Channels were dredged along the island alignment for access to build the island complex. This dredged material was transported about 5 miles upstream and used as capping material for ash piles at Interstate Power Company.

The island complex will eliminate direct sediment-laden flows through 140 acres of backwater during normal flow conditions and reduce wave action in 180 acres of the backwater. This should improve water clarity and encourage the growth of aquatic plants in the backwater area. Dredging in the backwater for construction access and the rock substrate of the island will increase habitat diversity for fish.

The Supplemental Definite Project Report/Environmental Assessment (SP-3A), Pool 9 Island Construction Habitat Rehabilitation and Enhancement Project, July 1993, provides details on the formulation and evaluation processes and the overall project.

CONSTRUCTION HISTORY

A contract (DACW37-94-C-0040) was awarded to J.F. Brennan Co., Inc., La Crosse, Wisconsin, on 31 August 1994 at the bid price of $990,963. Notice to proceed was issued on 15 September 1994. Actual construction began on 29 April 1995. Piles were driven for temporary mooring and access dredging was done mechanically. The dredged material was barged to a temporary unloading facility at Interstate Power Company near Lansing, IA. The material was then hauled to the power company's ash piles where it was spread for topsoil and seeded. Rockfill was loaded at the temporary facility at the Interstate Power Company and transported by barge to the project site to build the island complex. No significant or unusual problems were encountered with the construction. A pre-final inspection was held on 21 June 1995 and the project acceptance was 23 June, with a final contract cost of $990,555.59.

PART II - PROJECT OPERATION AND MAINTENANCE

GENERAL RESPONSIBILITIES AND PROCEDURES

Approved Responsibilities

Operation and maintenance responsibilities for the Pool 9 Island habitat project were originally outlined in the Supplemental Definite Project Report. These responsibilities were formally accepted by an agreement between the U.S. Fish and Wildlife Service (USFWS) and the St. Paul District, Corps of Engineers, fully executed on 18 April 1994 (see appendix B). The capability of the USFWS to carry out the maintenance responsibilities described below will be contingent upon the passage of sufficient appropriations by Congress. Average annual operation and maintenance costs estimated in the Supplemental Definite Project Report for the project were $1,500.

District Manager

Typically, the USFWS operation and maintenance responsibility for habitat projects is given to the district manager in charge of that portion of the appropriate National Wildlife Refuge. For the Pool 9 Island project, the current address is: District Manager, U.S. Fish and Wildlife Service, P.O. Box 460, McGregor, Iowa 52157, telephone #(319) 873-3423. Hereafter, for the purposes of this manual, when describing responsibilities, etc., the term "District Manager" will be used.

Improvements or Alterations

It is understood that improvements or alterations to any portion of the habitat project that would affect the ability of that element to function as intended to meet the project's habitat goals and objectives would be coordinated with other involved agencies. Along with the St. Paul District, these agencies are the Wisconsin and Iowa Departments of Natural Resources. Improvements or alterations should not be undertaken without the mutual consent of the involved agencies.

Procedure for Reviewing Operation and Maintenance Responsibilities

The District Engineer or his representative will be kept informed on operation and maintenance activities for the Pool 9 Island habitat project through a periodic inspection of the project by the Corps and through analysis of an annual inspection checklist submitted by the USFWS. The Corps will inspect the project with a USFWS representative at least once every 3 years, and at other times as may be required. The Corps should contact the District Manager so that a mutually convenient date can be set up for the joint inspection. The findings of these inspections will be transmitted to the USFWS and could include recommendations for any remedial work considered necessary to maintain the habitat project in a satisfactory operating condition. Any agreed upon remedial work should be completed as soon as possible by the USFWS as provided for in the Memorandum of Agreement between the USFWS and the Corps. Since the project is located in the state of Wisconsin, it is recommended that the USFWS also coordinate any remedial work with the Wisconsin Department of Natural Resources to ascertain whether permits are needed prior to performing the work.

Annual Report

A checklist report and project drawing showing damaged areas encountered during the annual inspection of the habitat project shall be submitted each year to the District Engineer. The USFWS may send the Pool 9 Island report in conjunction with reports on other habitat projects for which it has responsibility. If so desired, these reports can be sent to the Corps with the annual Cooperative Agreement Report which is done every April by the USFWS. A sample copy of the checklist (including a project drawing) can be found in appendix C. Besides completion of the inspection checklist, each individual report should briefly summarize the condition of the entire system, including any maintenance work done during the past 1-year period.

OPERATION

There are no operational requirements associated with the Pool 9 Island habitat project.

MAINTENANCE

General Inspection and Maintenance

The established points and times at which the required inspections should be made were developed through coordination between the Corps of Engineers and the USFWS during the preparation of plans and specifications for this project. After the habitat project has been in operation for 5 years, the Corps and the USFWS will review these inspection activities for adequacy. The frequency and nature of the inspections may be modified by mutual written agreement. If the design goals discussed under "DESCRIPTION OF PROJECT" have not been achieved in spite of proper maintenance, continued operation and maintenance of this project could be discontinued by mutual written agreement of the two Government agencies.

Inspection

The island complex should be visually inspected by the District Manager at a minimum frequency of once a year to insure that it is functionally intact. Inspections should also be made after any flood whose elevation exceeds 626.0 feet above mean sea level (msl) at the lock 9 headwater gage. The general condition of the island complex should be noted. If photographs of the site are taken, these should accompany the submitted report.

The frequency for inspection will be subject to review by the USFWS and the Corps and could change upon mutual agreement of both parties. The timing of the inspection can be made at the discretion of the District Manager.

Maintenance

Maintenance of the project features will be accomplished on an as needed basis by the District Manager, such that their structural integrity is maintained and they continue to function in the manner for which they were designed. If the District Manager encounters project conditions that are judged to exceed normally expected maintenance, the Corps' technical staff should be contacted so that a determination can be made as to whether the problem is considered a maintenance responsibility or project rehabilitation. Specific maintenance requirements are as follows:

a) Any significant loss of rockfill should be replaced to prevent further loss of rockfill and to provide protection of the interior area from external wave action. A continuous opening in the island greater than 10 feet wide at the average water surface elevation of 620.0 should be closed with rockfill.

b) Some long term settlement of the rockfill mound is expected. However, if the elevation of the top of the mound falls below the average water surface of 620.0, the Corps' geotechnical staff should be consulted prior to proceeding with any repairs.

c) No maintenance of access dredged areas is required.

Repair Materials

Appendix D contains excerpts from the construction specifications that provide a description of the materials and procedures required for the repair of the structures. Repair activities include the following:

a) Rockfill mound replacement. As-built drawings should be consulted for placement of rockfill and dimensions.

INSPECTIONS, TESTS, AND OPERATIONS FOLLOWING MAJOR STORMS OR FLOODS

General

As stated in the Memorandum of Agreement between the USFWS and the Corps, the Corps will be responsible for any mutually agreed upon repair and rehabilitation of the Pool 9 Island habitat project that exceeds the annual maintenance requirements and that may be needed as a result of a specific storm or flood. The project will be inspected as previously described, following flood events producing a water surface elevation greater than 626.0 feet (msl) at the lock 9 headwater gage.

Project Rehabilitation or Abandonment

Should inspection of the project area following a major flood or natural disaster disclose substantial damage to any of the major components of the project that appears to exceed the annual operation and maintenance as specified in this manual and the Supplemental Definite Project Report, the Corps and the USFWS should meet and discuss the appropriate course of action in light of the original project design. The inspections by the District Manager (as summarized in the submitted checklist) and the joint inspections with the Corps will be the basis for determining maintenance responsibility by the USFWS versus potential rehabilitation by the Corps. Repair of damage attributable to lack of maintenance would be considered a USFWS responsibility.

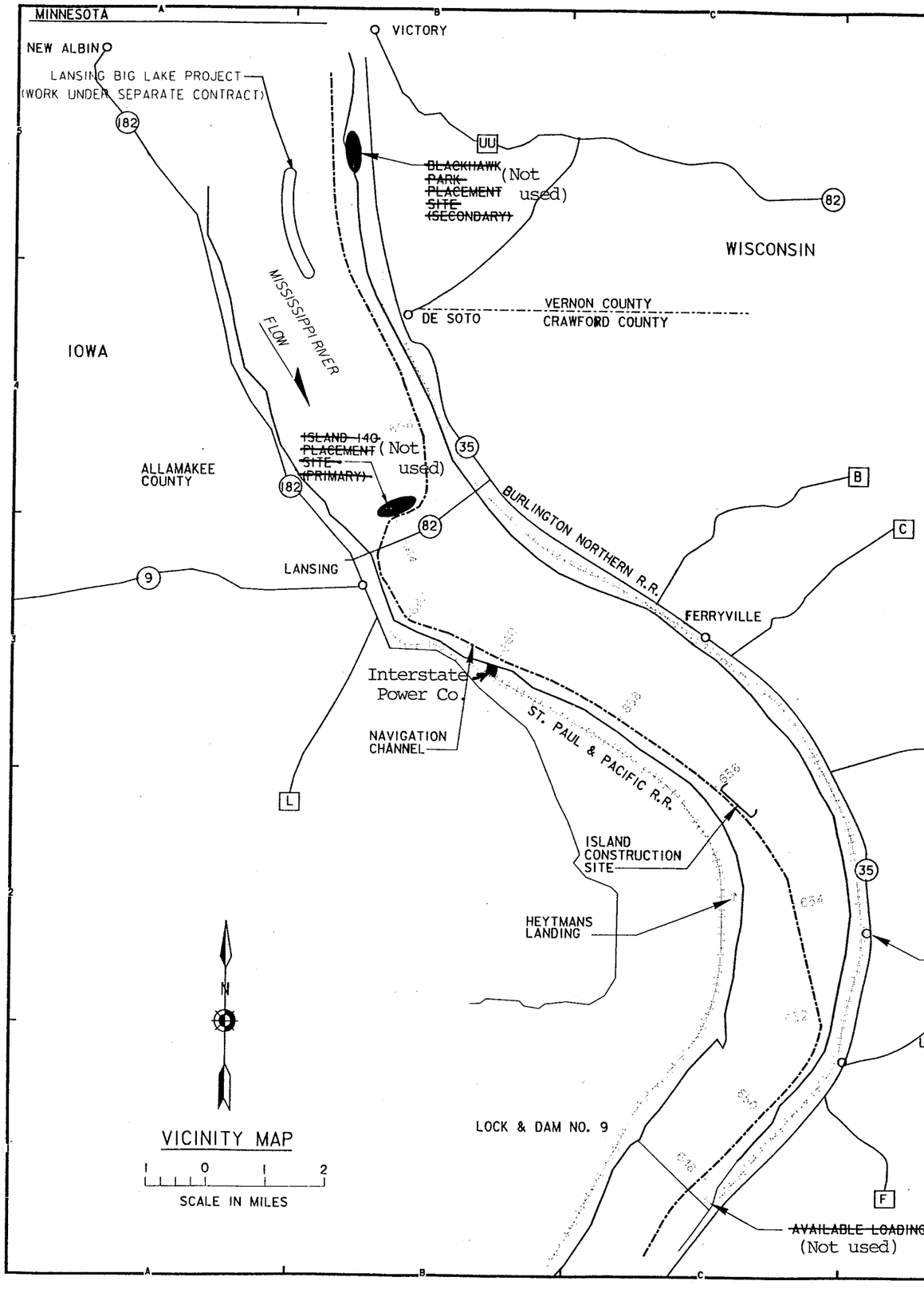
The options of rehabilitation or abandonment of the project may be considered at this time. Any decision would be carried forth only upon written mutual agreement of the USFWS and the Corps. Included within such agreement would be a description of the agreed upon course of action and funding responsibilities, if any. The Wisconsin Department of Natural Resources will be consulted prior to coming to any final determination on a course of action.

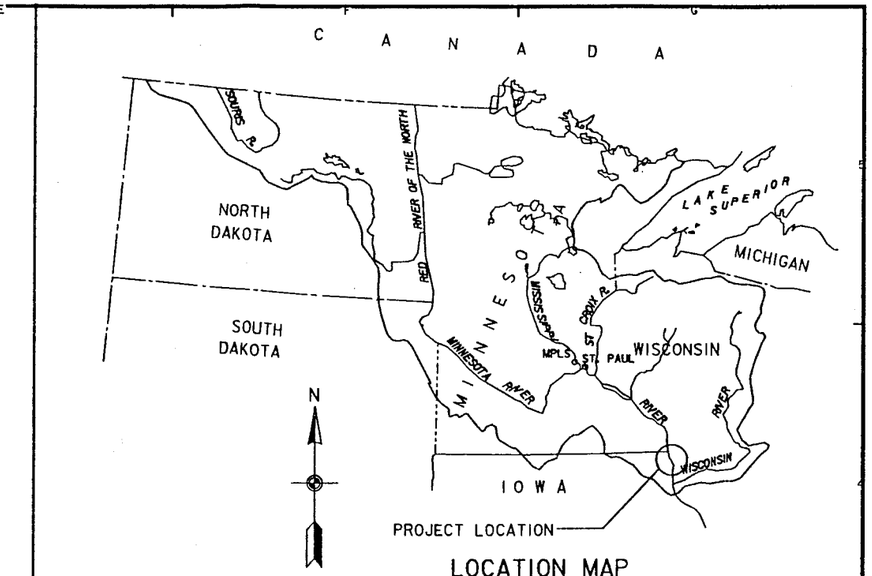
Project Monitoring and Evaluation

Performance monitoring of the Pool 9 Island habitat project will be conducted by the Corps of Engineers as presented in appendix E to help determine the extent to which the design meets the habitat improvement objectives. The post-construction evaluation basically includes flow, sounding, and wave height measurements in the island complex area. Information from this monitoring will also be used, if required, when ascertaining whether rehabilitation or abandonment of portions of this project would be the wisest choice. If any additional information of this nature is obtained by the USFWS, it should be submitted to the Corps of Engineers in conjunction with the annual report.

APPENDIX A

PROJECT DRAWINGS





DRAWING INDEX			
DRAWING NO.	SHT.	DESCRIPTION	CAD NAME
M-P9-10/14	1	LOCATION, VICINITY MAP & DRAWING INDEX	POOL9COV.DGN
M-P9-10/15	2	GENERAL PLAN, BORING LOCATIONS & HORIZONTAL CONTROL DATA	PLAN9IS.DGN
M-P9-60/2	3	PLANS AND SECTIONS - ISLANDS & MARKERS	IS140MAK.DGN
~~M-P9-60/3~~	~~4~~	~~ISLAND 140 SITE PLAN - PRIMARY DREDGED MATERIAL PLACEMENT SITE~~	~~ISLAN140.DGN~~
~~M-P9-60/4~~	~~5~~	~~BLACKHAWK PARK SITE PLAN - SECONDARY DREDGED MATERIAL PLACEMENT SITE~~	~~A60E592.DGN~~
~~M-P9-60/5~~	~~6~~	~~TYPICAL SECTIONS - DREDGED MATERIAL PLACEMENT SITES~~	~~ISTYPXS.DGN~~

REFERENCE DRAWINGS		
M-L9-14/28		~~HYDROGRAPHS (POOL) - JANUARY TO DECEMBER (1984-88)~~
M-L9-14/29		HYDROGRAPHS (POOL) - JANUARY TO DECEMBER (1989-93)
M-L9-14/24		ELEVATION DURATION CURVES (POOL) JANUARY TO JUNE (1971-93)
M-L9-14/25		ELEVATION DURATION CURVES (POOL) JULY TO DECEMBER (1971-93)
M-P9-10/16		LEGEND, GENERAL NOTES AND LOGS 87-1M THRU 87-4M
M-P9-10/17		LOGS 87-5M, 87-6M, 90-7M, THRU 90-9M

GEN ENG
HYD
HYDR
GEOTECH
STR ENG
MEA

SIGNATURES AFFIXED BELOW INDICATE OFFICIAL RECOMMENDATION AND APPROVAL OF ALL DRAWINGS IN THIS SET, AS INDEXED ON THIS SHEET. *REGISTERED PROFESSIONAL ENGINEER (AS REQUIRED BY ENGINEER CIRCULAR NO. 1110-1-76)

APPROVAL RECOMMENDED BY:

CHIEF ED-D BRANCH

CHIEF ED/GH BRANCH

CHIEF ENGINEERING DIVISION

APPROVED BY:

COL., CORPS OF ENGINEERS

ENGINEER MANAGER

CHIEF SPECS. & TECH. SUPPORT SECTION

CHIEF GENERAL ENGINEERING SECTION
N/A

CHIEF STRUCTURAL SECTION
N/A

CHIEF MECH/ELEC/ARCH SECTION

CHIEF HYDRAULICS SECTION

CHIEF HYDROLOGY SECTION

CHIEF GEOTECHNICAL DESIGN SECTION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	AS-BUILT AS OF COMPLETION DATE	6/95	

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ST. PAUL, MINNESOTA

AE APPROVING OFFICIAL:

ED-D: DESIGNED: GRB; CHECKED: RCB; DRAWN: T.J./FJB

ED-GH: DESIGNED: ; CHECKED:

DATE: 06-07-94

AS-BUILT
POOL 9 ISLAND
ENVIRONMENTAL MANAGEMENT PROGRAM - MISSISSIPPI RIVER
POOL NO. 9 CRAWFORD COUNTY, WISC.
ISLAND CONSTRUCTION
LOCATION, VICINITY MAP & DRAWING INDEX

CAD FILE NAME: POOL9COV.DGN
SPEC NO: DACW37-94-B-0025
DRAWING NUMBER: M-P9-10/14
SHT 1 OF 6

MISS. RIVER HORZ. CONTROL

HUB	AZIMUTH	DISTANCE	NORTHING	EASTING
9-17			663,326.71	2,642,664.22
9-18			664,862.32	2,639,947.17
9-19			667,022.58	2,639,447.12
9-20			667,504.25	2,638,261.31

COORDINATES BASED ON IOWA STATE PLANE GRID SYSTEM, NORTH ZONE

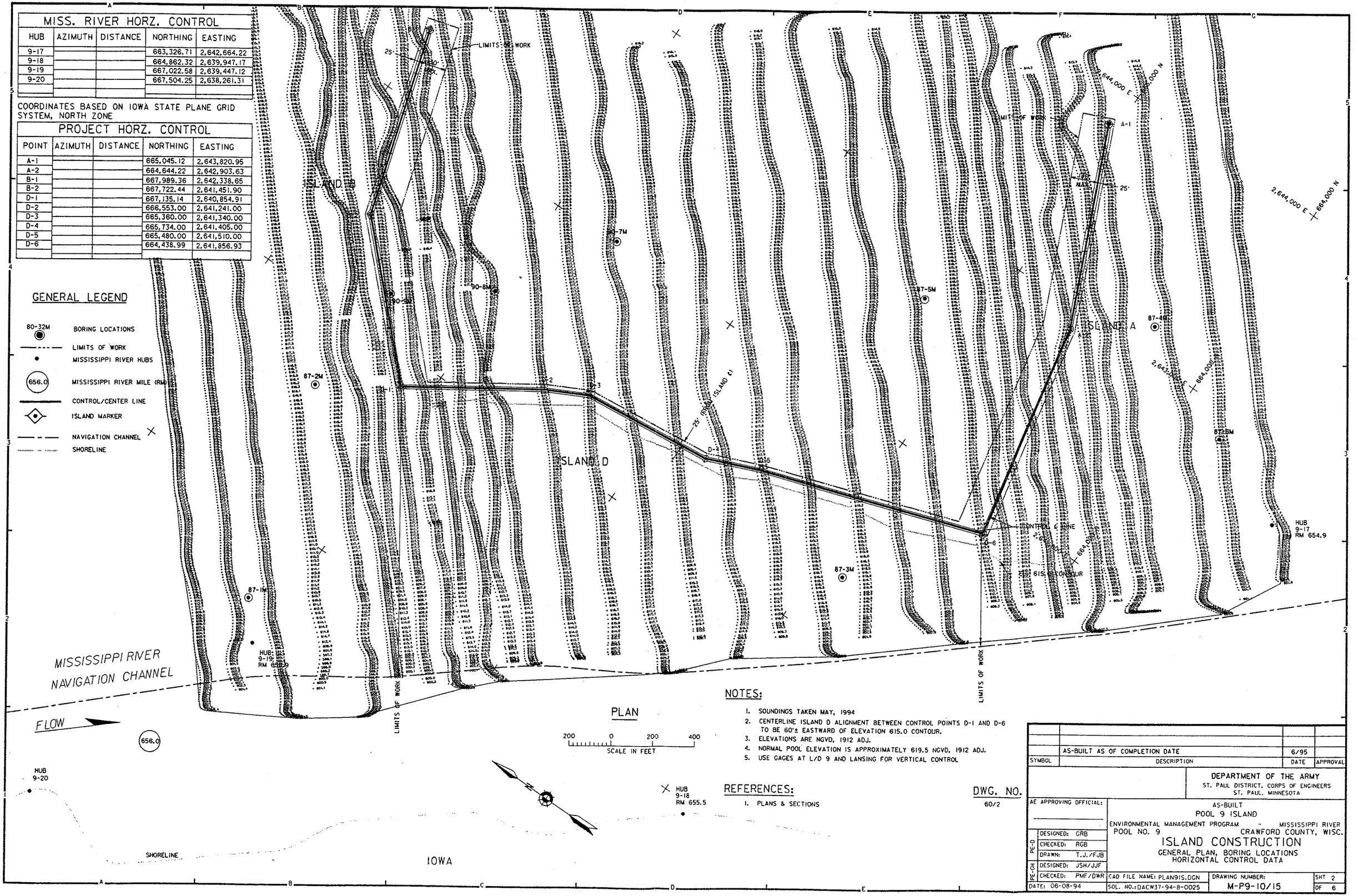
PROJECT HORZ. CONTROL

POINT	AZIMUTH	DISTANCE	NORTHING	EASTING
A-1			665,045.12	2,643,820.95
A-2			664,644.22	2,642,903.63
B-1			667,989.36	2,642,338.65
B-2			667,722.44	2,641,451.90
D-1			667,135.14	2,640,854.91
D-2			666,553.00	2,641,241.00
D-3			665,360.00	2,641,340.00
D-4			665,734.00	2,641,405.00
D-5			665,480.00	2,641,510.00
D-6			664,438.99	2,641,856.93

GENERAL LEGEND

- 80-32M — BORING LOCATIONS
- LIMITS OF WORK
- MISSISSIPPI RIVER HUBS
- (656.0) MISSISSIPPI RIVER MILE (RM)
- CONTROL/CENTER LINE
- ISLAND MARKER
- NAVIGATION CHANNEL
- SHORELINE

GEN ENG
HYD
HYDR
GEOTECH
STR ENG



PLAN

200 0 200 400
SCALE IN FEET

NOTES:

1. SOUNDINGS TAKEN MAY, 1994
2. CENTERLINE ISLAND D ALIGNMENT BETWEEN CONTROL POINTS D-1 AND D-6 TO BE 60'± EASTWARD OF ELEVATION 615.0 CONTOUR.
3. ELEVATIONS ARE NGVD, 1912 ADJ.
4. NORMAL POOL ELEVATION IS APPROXIMATELY 619.5 NGVD, 1912 ADJ.
5. USE GAGES AT L/D 9 AND LANSING FOR VERTICAL CONTROL

REFERENCES:

1. PLANS & SECTIONS

DWG. NO. 60/2

SYMBOL	DESCRIPTION	DATE	APPROVAL
	AS-BUILT AS OF COMPLETION DATE	6/95	

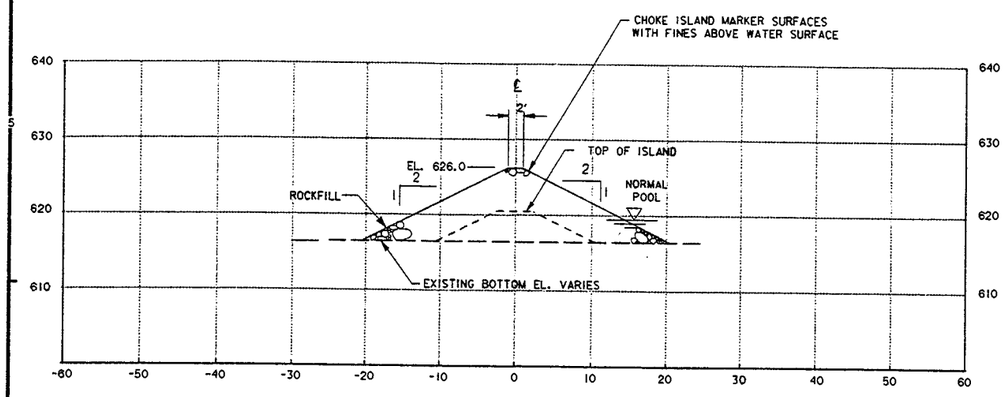
DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ST. PAUL, MINNESOTA

AE APPROVING OFFICIAL:

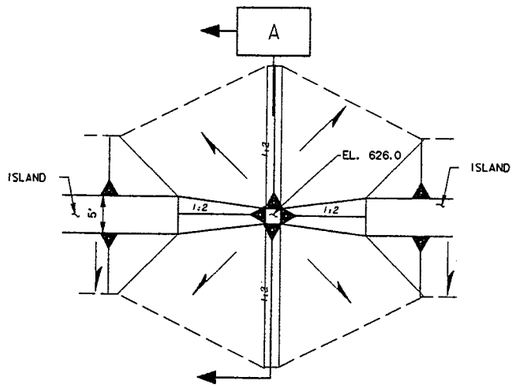
PE-D: DESIGNED: GRB; CHECKED: RGB; DRAWN: T.J./FJB
PE-CH: DESIGNED: JSH/JJF; CHECKED: PMF/DWR

AS-BUILT
POOL 9 ISLAND
ENVIRONMENTAL MANAGEMENT PROGRAM - MISSISSIPPI RIVER
POOL NO. 9 CRAWFORD COUNTY, WISC.
ISLAND CONSTRUCTION
GENERAL PLAN, BORING LOCATIONS
HORIZONTAL CONTROL DATA

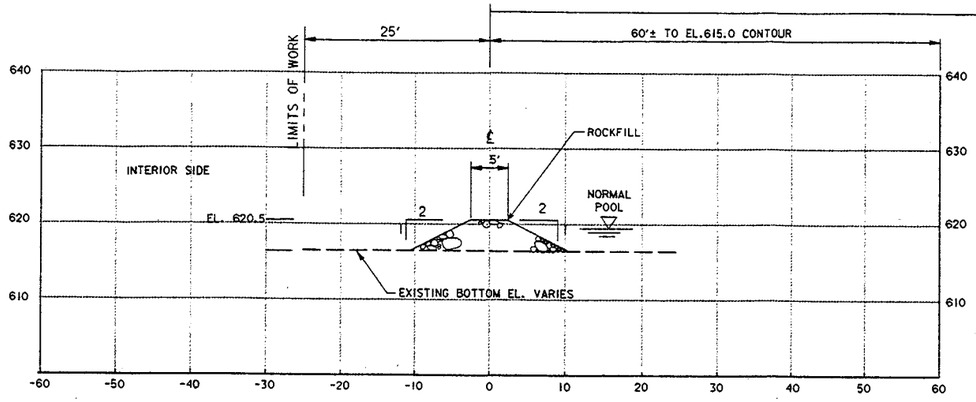
DATE: 06-08-94
CAD FILE NAME: PLAN9IS.DGN
SOL. NO.:DACW37-94-B-0025
DRAWING NUMBER: M-P9-10/15
SHT 2 OF 6



SECTION
ISLAND MARKERS — A

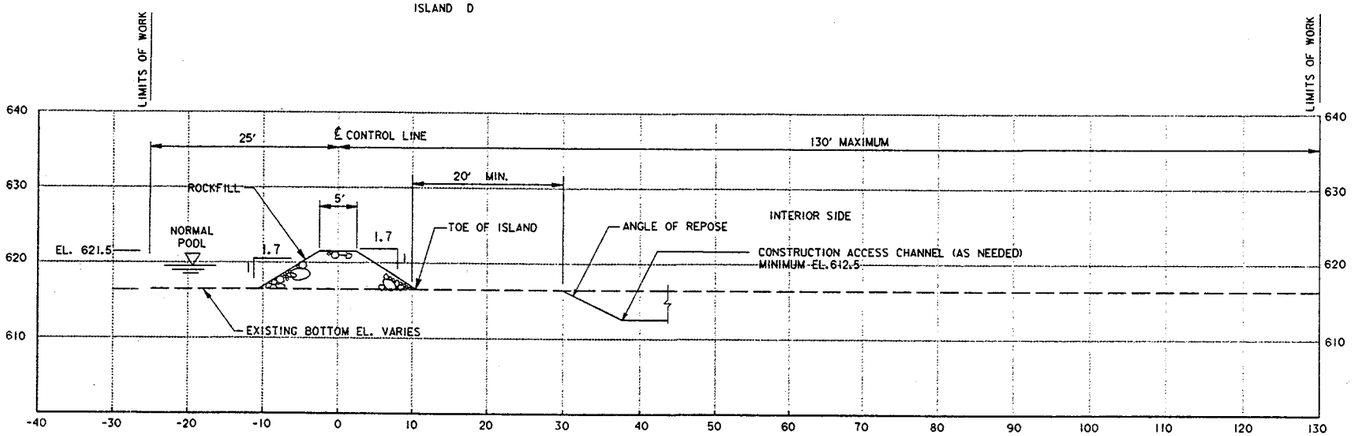


PLAN
INTERMEDIATE ISLAND MARKERS (A2, B2 & D4)

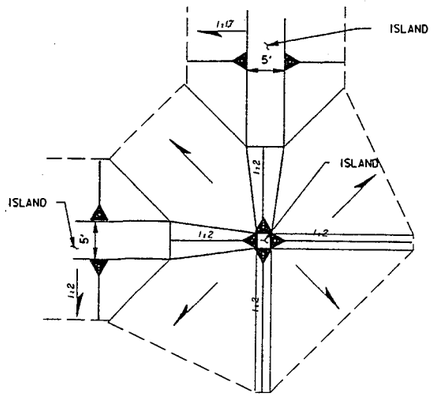


TYPICAL SECTION
ISLAND D

PLAN
ISLAND MARKER ENDS (A1 & B1)



TYPICAL SECTION
ISLAND A & B
(ISLAND A WOULD BE REVERSED)



PLAN
ISLAND MARKER CORNERS (D1 & D6)

NOTES:
1. ELEVATIONS ARE 1912 N.G.V.D. ADJ.

REFERENCES:
1. GENERAL PLAN

DWG. NO.
10/15

GEN ENG
HYD
HYDR
GEOTECH
STR ENG

SYMBOL	DESCRIPTION	DATE	APPROVAL
	AS-BUILT AS OF COMPLETION DATE	6/95	

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ST. PAUL, MINNESOTA

AE APPROVING OFFICIAL:

AS-BUILT
POOL 9 ISLAND
ENVIRONMENTAL MANAGEMENT PROGRAM - MISSISSIPPI RIVER
POOL NO. 9 CRAWFORD COUNTY, WISC.

ISLAND CONSTRUCTION
PLANS AND SECTIONS
ISLANDS & MARKERS

PE-D	DESIGNED: GRB		
	CHECKED: RGB		
	DRAWN: TJ		
PE-GH	DESIGNED: JSH/JJF		
	CHECKED: PMF/DWR	CAD FILE NAME: IS140MAK.DGN	DRAWING NUMBER: M-P9-60/2 SHT 3 OF 6
DATE: 06-09-94		SOL. NO.: DACW37-94-B-0025	

APPENDIX B

MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT
BETWEEN
THE UNITED STATES FISH AND WILDLIFE SERVICE
AND
THE DEPARTMENT OF THE ARMY
FOR
ENHANCING FISH AND WILDLIFE RESOURCES
OF THE
UPPER MISSISSIPPI RIVER SYSTEM
AT THE
POOL 9 ISLAND CONSTRUCTION
CRAWFORD COUNTY, WISCONSIN

I. PURPOSE

The purpose of this Memorandum of Agreement (MOA) is to establish the relationships, arrangements, and general procedures under which the U.S. Fish and Wildlife Service (USFWS) and the Department of the Army (DOA) will operate in constructing, operating, maintaining, repairing, and rehabilitating the Pool 9 Island separable element of the Upper Mississippi River System - Environmental Management Program (UMRS-EMP).

II. BACKGROUND

Section 1103 of the Water Resources Development Act of 1986, Public Law 99-662, authorizes construction of measures for the purpose of enhancing fish and wildlife resources in the Upper Mississippi River System. The project area is managed by the USFWS and is on land managed as a national wildlife refuge. Under conditions of Section 906(e) of the Water Resources Development Act of 1986, Public Law 99-662, all construction costs of those fish and wildlife features for the Pool 9 Island Construction project are 100 percent Federal, and pursuant to Section 107(b) of the Water Resources Development Act of 1992, Public Law 102-580, all costs of operation and maintenance for the Pool 9 Island Construction project are 100 percent Federal.

III. GENERAL SCOPE

The project to be accomplished pursuant to this MOA shall provide a stable barrier between the Pool 9 backwater area and the main channel, eliminating direct flow through about 140 acres of backwater during normal river flows. The project also reduces boat- and wind-generated waves in the 140-acre area to improve conditions for the establishment of aquatic plant beds.

IV. RESPONSIBILITIES

A. DOA is responsible for:

1. Construction: Construction of the project which consists of building a 6,500-foot-long island complex in the backwater area along 3,000 feet of the main channel. The upper end of the island would extend into the backwater about 1,600 feet and the lower end 1,900 feet. The island complex would be constructed entirely of rockfill. Fine sediments dredged from the backwater for construction access would be placed at a channel maintenance placement site near Lansing, Iowa, (about 9 miles upstream) and at Blackhawk Park, Wisconsin (6 miles further upstream).

2. Major Rehabilitation: The Federal share of any mutually agreed upon rehabilitation of the project that exceeds the annual operation and maintenance requirements identified in the Supplemental Definite Project Report and that is needed as a result of specific storm or flood events.

3. Construction Management: Subject to and using funds appropriated by the Congress of the United States, and in accordance with Section 906(e) of the Water Resources Development Act of 1986, Public Law 99-662, DOA will construct the Pool 9 Island project as described in the Supplemental Definite Project Report/Environmental Assessment, Pool 9 Island Construction, Habitat Rehabilitation and Enhancement Project, dated July 1993, applying those

procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The USFWS will be afforded the opportunity to review and comment on all modifications and change orders prior to the issuance to the contractor of a Notice to Proceed. If DOA encounters potential delays related to construction of the Project, DOA will promptly notify USFWS of such delays.

4. Maintenance of Records: The DOA will keep books, records, documents, and other evidence pertaining to costs and expenses incurred in connection with construction of the project to the extent and in such detail as will properly reflect total costs. The DOA shall maintain such books, records, documents, and other evidence for a minimum of three years after completion of construction of the project and resolution of all relevant claims arising therefrom, and shall make available at its offices, at reasonable times, such books, records, documents, and other evidence for inspection and audit by authorized representatives of the USFWS.

B. USFWS is responsible for operation, maintenance, and repair: Upon completion of construction as determined by the District Engineer, St. Paul, the USFWS shall accept the project and shall operate, maintain, and repair the project as defined in the Supplemental Definite Project Report/Environmental Assessment entitled "Pool 9 Island Construction, Habitat Rehabilitation and Enhancement Project," dated July 1993, in accordance with Section 107(b) of the Water Resources Development Act of 1992, Public Law 102-580.

V. MODIFICATION AND TERMINATION

This MOA may be modified or terminated at any time by mutual agreement of the parties. Any such modification or termination must be in writing. Unless otherwise modified or terminated, this MOA shall remain in effect for a period of no more than 50 years after initiation of construction of the project.

VI. REPRESENTATIVES

The following individuals or their designated representatives shall have authority to act under this MOA for their respective parties:

USFWS: Regional Director
U.S. Fish and Wildlife Service
Bishop Henry Whipple Federal Building
1 Federal Drive
Fort Snelling, Minnesota 55111-4056

DOA: District Engineer
Department of the Army
Corps of Engineers, St. Paul District
190 Fifth Street East
St. Paul, Minnesota 55101-1638

VII. EFFECTIVE DATE OF MOA

This MOA shall become effective when signed by the appropriate representatives of both parties.

THE DEPARTMENT OF THE ARMY

BY: _____
(signature)
for JAMES T. SCOTT
Colonel, Corps of Engineers
St. Paul District

Date 18 Apr 94

THE U.S. FISH AND WILDLIFE SERVICE

BY: _____
for (signature)
SAM MARLER
Regional Director
U.S. Fish and Wildlife Service

Date 4/7/94

APPENDIX C

INSPECTION CHECKLIST FORM

Inspection Checklist

POOL 9 ISLAND
Habitat Rehabilitation and Enhancement Project
Environmental Management Program
Pool 9 - Upper Mississippi River

TO: U.S. Army Corps of Engineers
ATTN: CENCS-CO-TS
Army Corps of Engineers Centre
190 Fifth Street East
St. Paul, Minnesota 55101-1638

Inspected by: _____ Date: _____

Type of Inspection: ( ) Annual ( ) Flood ( ) Major Storm
( ) Other _____

Note: Show any problem areas on the attached project drawing.

I. ISLAND A
( ) No Major Problems
( ) Displaced Rockfill Location(s) _____
_____
( ) Settlement Location(s) _____
_____
( ) Rockfill Needed - estimate of quantity _____ CY

II. ISLAND B
( ) No Major Problems
( ) Displaced Rockfill Location(s) _____
_____
( ) Settlement Location(s) _____
_____
( ) Rockfill Needed - estimate of quantity _____ CY

III. ISLAND D
( ) No Major Problems
( ) Displaced Rockfill Location(s) _____
_____
( ) Settlement Location(s) _____
_____
( ) Rockfill Needed - estimate of quantity _____ CY

IV. OTHER ITEMS (List)

A. Areas needing special attention (describe and show on the attached project drawing)

B. Maintenance performed during the past year (include location of work, volume of rockfill placed, and cost)

C. Maintenance needed (include itemized estimate of cost to repair)

D. Other Comments

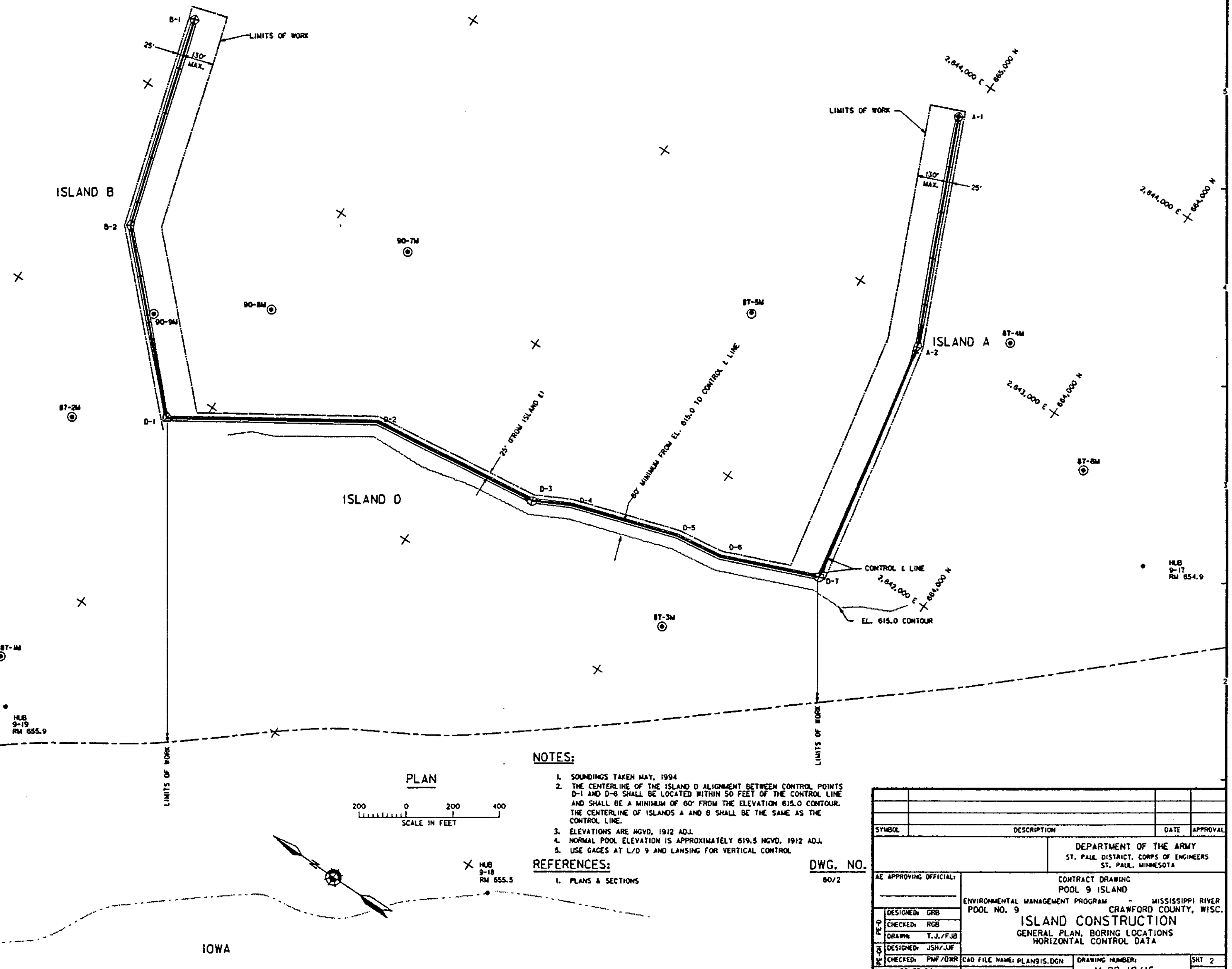
MISS. RIVER HORZ. CONTROL				
HUB	AZIMUTH	DISTANCE	NORTHING	EASTING
9-17			683,328.71	2,642,664.22
9-18			664,862.32	2,639,947.17
9-19			667,022.58	2,639,447.12
9-20			667,504.25	2,638,261.31

COORDINATES BASED ON IOWA STATE PLANE GRID SYSTEM, NORTH ZONE

PROJECT HORZ. CONTROL				
POINT	AZIMUTH	DISTANCE	NORTHING	EASTING
A-1			665,045.12	2,643,820.95
A-2			664,644.22	2,642,903.63
B-1			667,989.38	2,642,338.65
B-2			667,722.44	2,641,451.90
D-1			667,135.14	2,640,854.91
D-2			666,376.85	2,641,345.60
D-3			665,639.35	2,641,440.04
D-4			665,485.69	2,641,519.40
D-5			665,035.80	2,641,667.11
D-6			664,833.96	2,641,694.64
D-7			664,438.99	2,641,856.93

GENERAL LEGEND

- 80-32M BORING LOCATIONS
- LIMITS OF WORK
- MISSISSIPPI RIVER HUBS
- 656.0 MISSISSIPPI RIVER MILE (RM)
- CONTROL/CENTER LINE
- ISLAND MARKER
- NAVIGATION CHANNEL
- SHORELINE



EN ENG
HYD
HYDR
GEOTECH
TR ENG
MEA

NOTES:

1. SOUNDINGS TAKEN MAY, 1994
2. THE CENTERLINE OF THE ISLAND D ALIGNMENT BETWEEN CONTROL POINTS D-1 AND D-6 SHALL BE LOCATED WITHIN 50 FEET OF THE CONTROL LINE AND SHALL BE A MINIMUM OF 60' FROM THE ELEVATION 615.0 CONTOUR. THE CENTERLINE OF ISLANDS A AND B SHALL BE THE SAME AS THE CONTROL LINE.
3. ELEVATIONS ARE NGVD, 1912 ADJ.
4. NORMAL POOL ELEVATION IS APPROXIMATELY 619.5 NGVD, 1912 ADJ.
5. USE GAGES AT L/D 9 AND LANSING FOR VERTICAL CONTROL

REFERENCES:

	DWG. NO.
1. PLANS & SECTIONS	60/2

SYMBOL	DESCRIPTION	DATE	APPROVAL

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ST. PAUL, MINNESOTA

AE APPROVING OFFICIAL:

PE-D	DESIGNED:	GRB
PE-D	CHECKED:	RGB
PE-D	DRAWN:	T.J./FJB
PE-CH	DESIGNED:	JSH/JJF
PE-CH	CHECKED:	PMF/DWR
	DATE:	06-08-94

CONTRACT DRAWING
POOL 9 ISLAND
ENVIRONMENTAL MANAGEMENT PROGRAM - MISSISSIPPI RIVER
POOL NO. 9 CRAWFORD COUNTY, WISC.

ISLAND CONSTRUCTION

GENERAL PLAN, BORING LOCATIONS
HORIZONTAL CONTROL DATA

CAD FILE NAME: PLAN9IS.DGN
SOL. NO.: DACW37-94-B-0025
DRAWING NUMBER: M-P9-10/15
SHT 2 OF 6

APPENDIX D

REPLACEMENT SPECIFICATIONS

2S - ROCKFILL ISLAND CONSTRUCTION

1. SCOPE. This section covers rockfill used for island construction.

2. SOURCES. The sources of suitable rockfill materials include the following:

QUARRY	LOCATION	OWNER/OPERATOR
Pool Hill	NW 1/4, Sec 9 T100N, R4W Allamakee Co., IA	Roverud Const. Co. Box 606 Spring Grove, MN 55974
Wexford	NE 1/4, Sec 36 T98N, R3W Allamakee Co., IA	Bruening Rock Products, Inc. 325 Washington St. Decorah, IA
Hanson	NW 1/4, SW 1/4, Sec 24 T11N, R3W Crawford Co, WI	Edward Kramer & Sons, Inc. One Plainview Road Plain, WI 53577

2.1 No rockfill shall come from the Mississippi River valley bluffs.

3. MATERIALS.

3.1 Rockfill shall be a durable quarried stone of suitable quality to ensure permanence in the Upper Mississippi River environment. Stone shall be free from cracks, seams and other defects that would unduly increase its deterioration from natural causes.

3.1.1 Specific gravity. Stone shall have a specific gravity of not less than 2.55 and not more than 2.75.

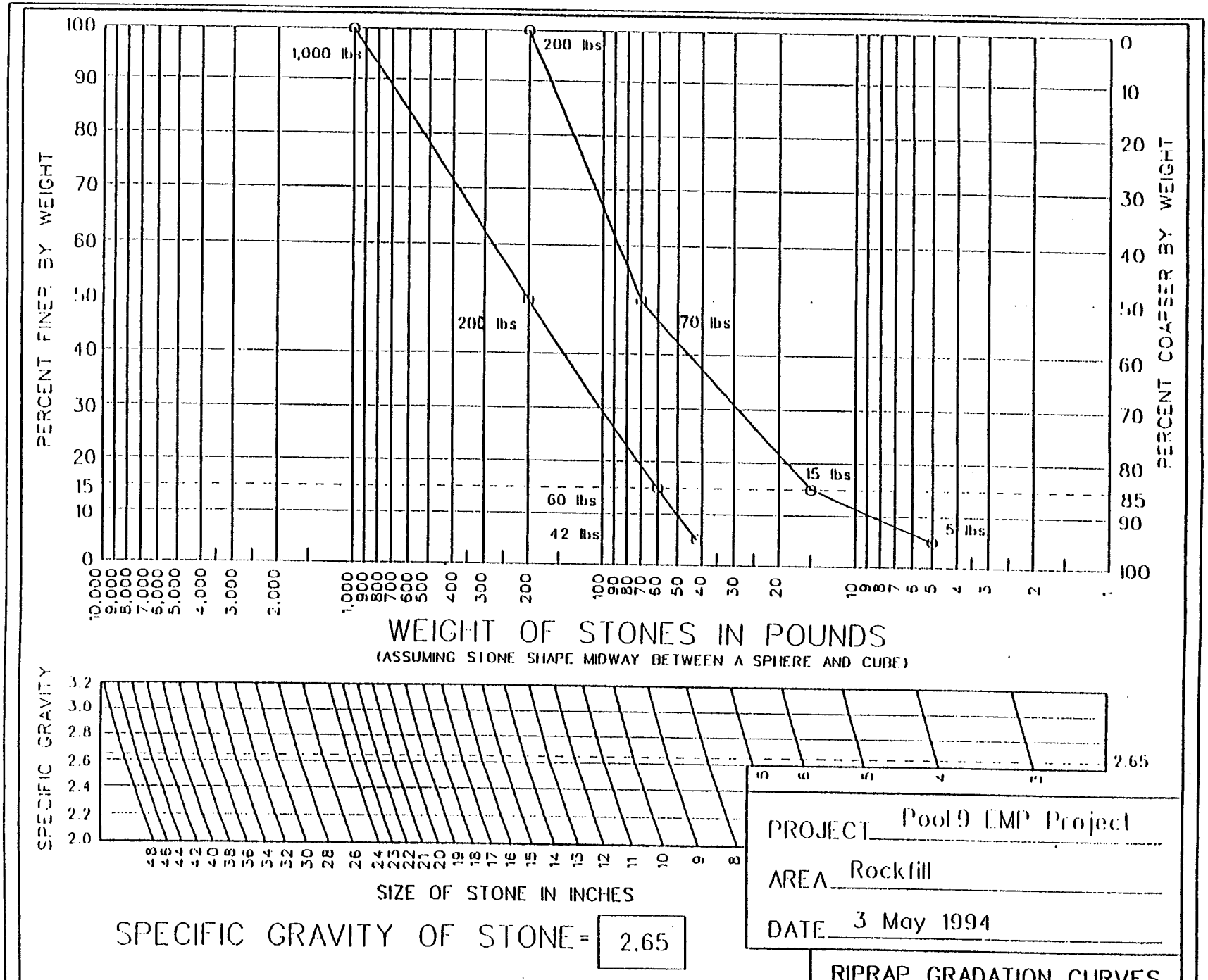
3.1.2 Shape. Neither the breadth not thickness of any individual stone shall be less than one-third its length.

3.1.3 Gradation. Riprap shall be graded within the limits presented in the gradation curves included at the end of this section.

4. PLACEMENT AND TOLERANCES.

4.1 Rockfill shall be constructed to the lines and grades shown or established within a tolerance of 6 inches above and 3 inches below the prescribed grade, except either extreme shall not be continuous over an area greater than 200 square feet. All rockfill shall be placed in such a manner as to produce a mass of unsegregated stone with maximum interlocking and stone to stone contact and a minimum of voids. The finished mass shall be free from pockets of small stones, clusters or larger stones and excessive voids. Placing rockfill by dumping into chutes or by similar methods likely to cause segregation shall not be permitted.

4.2 Rockfill to be placed under water shall meet gradation requirements in the bucket or container used for placing, and shall be placed in a systematic manner so as to ensure a continuous uniform section of well-graded stone. Stone to be placed under water shall not be cast across the surface of the water.


PERCENT FINER BY WEIGHT
PERCENT COARSER BY WEIGHT
1,000 lbs
200 lbs
200 lbs
70 lbs
15 lbs
60 lbs
42 lbs
5 lbs
WEIGHT OF STONES IN POUNDS
(ASSUMING STONE SHAPE MIDWAY BETWEEN A SPHERE AND CUBE)
SPECIFIC GRAVITY
2.65
SIZE OF STONE IN INCHES
SPECIFIC GRAVITY OF STONE = 2.65
PROJECT Pool 9 EMP Project
AREA Rockfill
DATE 3 May 1994
RIPRAP GRADATION CURVES

APPENDIX E

PROJECT OBJECTIVES AND MONITORING PLAN

Project Objectives and Monitoring Plan

Pool 9 Island Habitat Project
Crawford County, Wisconsin

DESCRIPTION OF PROJECT AREA

The Pool 9 Island project is located in the lower lake-like reach of pool 9 on the Wisconsin side of the Mississippi River at river mile 655.5, about 7.5 miles upstream of Lock and Dam 9, within the Upper Mississippi River National Wildlife and Fish Refuge.

DESCRIPTION OF PROJECT

The project includes a C-shaped rockfill island complex with a 5-foot top width at 1 foot above the average pool elevation of 620.0. The island complex parallels the main channel for 3,000 feet and extends into the backwater about 1,600 feet at the upper end and 1,900 feet at the lower end. Access channels about 65 feet wide and 6 feet deep were dredged along the interior side of the upper and lower islands. The dredged material was transported about 5 miles upstream and used to cap ash piles at a power company.

PROJECT GOALS

The goals are to eliminate direct sediment-laden flows through 140 acres of backwater during average flow conditions and to reduce wave action in 180 acres of the backwater. Dredging in the backwater for construction access provides additional deep water habitat for fish and the rock substrate provides more diverse fish habitat.

PROJECT OBJECTIVES AND MONITORING TASKS

The following objectives and monitoring tasks are taken from the final Supplemental Definite Project Report for the project. The monitoring tasks listed will be the responsibility of the Corps of Engineers. Any additional monitoring conducted by the U.S. Fish and Wildlife Service should be reported to the Corps on an annual basis. The monitoring shown below could be extended to be done after the authorized program ends in 2002 if funds are made available or if another agency assumes the effort.

Objective 1

Reduce flow through 140 acres of backwater area to improve fish and migratory bird habitat.

Monitoring Task - Flow velocity measurements inside the island complex during the summer at normal pool levels in 1996 and 1998 (also scheduled for 2005 and 2020 as explained above).

Objective 2

Provide protected, shallow habitat in 180 acres of backwater area to improve fish and migratory bird habitat.

Monitoring Task - Vegetation survey inside the island complex and Secchi disk readings both inside and outside the island complex during the summer at normal pool levels in 1996 and 1998 (also scheduled for 2005 and 2020 as explained above).

Objective 3

Provide a 180-acre area protected from boat generated waves to improve fish and migratory bird habitat.

Monitoring Task - Wave height measurements both inside and outside the island complex during the summer at normal pool levels in 1996 and 1998.

Objective 4

Provide deep water habitat (6 feet or more) for fisheries.

Monitoring Task - Cursory sounding of the areas dredged for access in 1996 and 1998 to document whether the areas still exist.