

**REVISION OF
MASTER PLAN
FOR
RESOURCE MANAGEMENT**

**POOLS 11-22
9-FOOT CHANNEL NAVIGATION PROJECT**



**U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS**

MAY 1972

NCDPD-ER (13 July 72) 2nd Ind

SUBJECT: Revision of Master Plan for Resource Management, Upper
Mississippi River, Pools 11-22, Nine-Foot Channel Navigation
Project

DA, North Central Division, Corps of Engineers, 536 South Clark Street,
Chicago, Illinois 60605 30 October 1972

TO: District Engineer, Rock Island

For information and appropriate action.

FOR THE DIVISION ENGINEER:



WALTER E. MC DONALD
Assistant Chief, Planning Division



DEPARTMENT OF THE ARMY
NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605

NCDPD-ER

13 July 1972

SUBJECT: Revision of Master Plan for Resource Management,
Upper Mississippi River, Pools 11-22, Nine-Foot
Channel Navigation Project

HQDA (DAEN-CWP-V)
WASH DC 20314

1. Chapters XI and XII of the subject master plan (Pools 20 and 21) are forwarded, recommending approval, subject to the following comments.
2. Reference Pages II-2, Paragraphs 4, and Plates II-2.1, Chapters XI and XII. The figures for high and low water elevations of record shown on Plates II-2.1 should be updated to agree with data presented in paragraphs 4.
3. Reference Page V-1, Paragraph 3, and Plate V-1.1, Chapter XII (Pool 21). Section V should explain the factors which will lead to the sharp increase in visitation in 1980.
4. The land use zoning and forestry management objectives indicated on the plastic overlays with the base maps are important features of this master plan. These overlays provide guides for achieving rational long range resource management on project lands and waters. Preparation of these land use zoning-forestry management overlays involved detailed analysis of resources and extensive coordination efforts which warrant special mention in the narrative portion of the plan. As indicated in Chapter I, General Information, the last chapter of the master plan, Chapter XIV, will contain a summary of the complete master plan. Chapter XIV will contain a section to emphasize the fact that the most significant long range value of this master plan can be realized through appropriate implementation of the land use zoning and forestry management features of the plan.
5. The chapters of the master plan covering the individual pools do not present sufficient data on needed recreational facility expansion. Chapter XIV will, therefore, provide a consolidated detailed analysis of all works specifically recommended in Pools 11 thru 22, to include the following:

NCDPD-ER

13 July 1972

SUBJECT: Revision of Master Plan for Resource Management,
Upper Mississippi River, Pools 11-22, Nine-Foot
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a. Existing Facilities Operated by the Corps.

(1) Provide site plans indicating expansion needed to meet increased demand, or modifications needed to improve site design or user control.

(2) Provide detailed cost estimates including costs of site preparation, landscaping and signs.

b. Dredging.

(1) Identify by pool and river mile all dredging proposed in support of recreational boating.

(2) Provide detailed information on length, width and depth of channel that should be provided and explain if dredged material can be used beneficially.

(3) Provide cost estimates for each site.

c. New Sites.

This master plan contains specific recommendations for development of new sites even though at this time no local agencies have indicated an intent to cost share. For these new sites, provide detailed cost estimates including special items of cost associated with development such as bridges, railroad crossings, ramps over levees and fencing.

d. Programming.

Establish priorities for recommended improvement of existing facilities. Indicate which improvements will be programmed for development under current policy prior to 30 June 1976 (See Appendix I of ER 1120-2-404).

NCDPD-ER

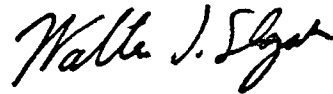
13 July 1972

SUBJECT: Revision of Master Plan for Resource Management,
Upper Mississippi River, Pools 11-22, Nine-Foot
Channel Navigation Project

6. Items discussed or proposed in this master plan do not in any way conflict with the current concept of a National Recreation Area for the Upper Mississippi River. In fact, this master plan and the related resource maps could very well serve as the framework for a more elaborate development and management plan should the National Recreation Area become a reality.

FOR THE DIVISION ENGINEER:

2 Incl (trip)
as fwd sep



WALTER J. SLAZAK
Colonel, Corps of Engineers
Deputy Division Engineer

DAEN-CWP-V (13 July 72) 1st Ind

SUBJECT: Revision of Master Plan for Resource Management, Upper
Mississippi River, Pools 11-22, Nine-Foot Channel Navigation
Project

DA, Office of the Chief of Engineers, Washington, DC 20314 4 Oct 72


TO: Division Engineer, North Central

Chapters XI and XII (Pools 20 and 21) of the subject Master Plan are approved subject to the comments expressed by NCDPD-ER in the basic letter and the following.

Subsequent input of material in Chapter XIV, as discussed in the basic letter, should designate the land uses as defined in ER 1130-2-400, ER 1120-2-400 and ER 1165-2-400 and delete on the plates and in the narrative the term priority of uses. In addition a separate summary section should be prepared on the plans and programs for historical and cultural preservation, restoration and administration pursuant to paragraph 4 of ER 1105-2-11.

FOR THE CHIEF OF ENGINEERS:

wd all incl


for IRWIN REISLER
Chief, Planning Division
Directorate of Civil Works



DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING
ROCK ISLAND, ILLINOIS 61201

IN REPLY REFER TO

NCRED-PB

15 May 1972

SUBJECT: Revision of Master Plan for Resource Management, Upper Mississippi River, Pools 11-22, Nine-Foot Channel Navigation Project

Division Engineer, North Central

1. Chapter XII, Pool 21, of the subject master plan is submitted in accordance with Engineer Manual 1130-2-302.
2. This chapter of the master plan contains specific information concerning the administration and development of the resources within the pool.
3. It is recommended that chapter XII of the master plan for resource management of the Mississippi River 9-foot channel navigation pools be approved.

2 Incls (6 cys)
1. Narrative, Pool 21
2. Maps, Pool 21

F. W. ASHTON
Acting District Engineer

cc: Dist File w/o incls
Engr Div w/o incls
~~Environ. Res. Sect~~ w/o incls

REVISION OF MASTER PLAN
FOR
RESOURCE MANAGEMENT

POOLS 11-22
NINE-FOOT CHANNEL NAVIGATION PROJECT

CHAPTER XII
THE MISSISSIPPI RIVER, POOL 21

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REVISION OF MASTER PLAN
FOR
RESOURCE MANAGEMENT

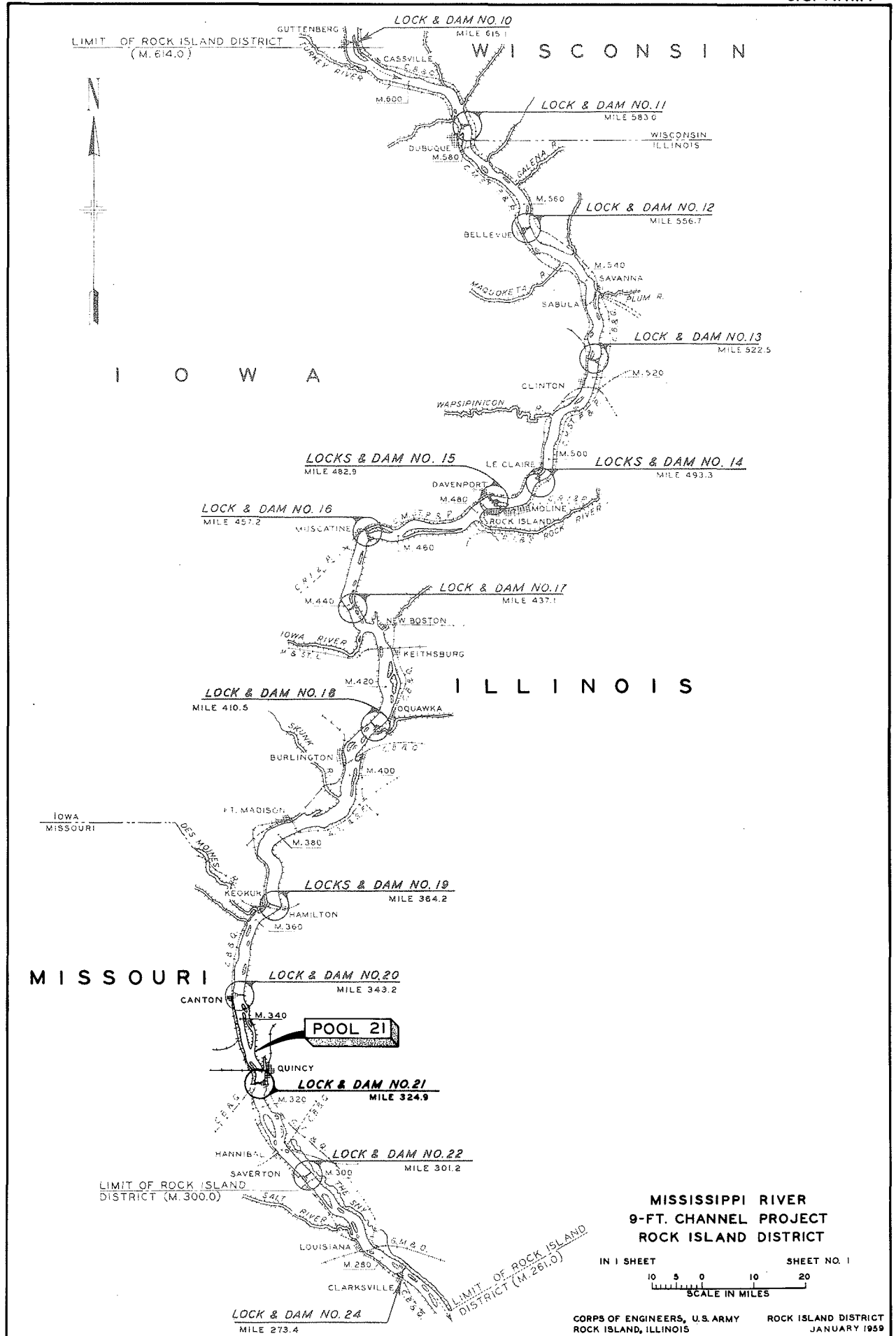
POOLS 11-22
NINE-FOOT CHANNEL NAVIGATION PROJECT

CHAPTER XII
THE MISSISSIPPI RIVER, POOL 21

SECTION I

INTRODUCTION

As noted in chapter I, a Master Plan is developed to provide a sound instrument of guidance for the administration and operation of land and water resource projects; to assure sound resource management; and to coordinate activities with interested Federal, State, and local agencies. Pool 21, one of the series of navigation pools on the Upper Mississippi River, and within the limits of the Rock Island District, is treated under such master planning requirements. Plate I-1.1 locates the pool with reference to others of the navigational system in the Rock Island District, U. S. Army Corps of Engineers.



SECTION II

DESCRIPTION OF PROJECT

1. General. In a downstream numerical sequence of navigation pools within the boundaries of the Rock Island District, Pool 21 is the eleventh of the 12 pools operated and administered by the U. S. Army Corps of Engineers. The pool extends between established river miles 324.9 and 343.2 - or, considering land features, from the lower limits of Quincy, Illinois, to the upper limits of Canton, Missouri. The pool is 18.3 river miles in length and is bounded by portions of Lewis and Marion Counties in Missouri and by Adams County along the Illinois shore.

2. Topography and geology. The Mississippi River in this pool has a meandering course through a broad flood plain which is superimposed on the filling of a much deeper preglacial valley. The filling is mostly sand and gravel glacial outwash. Mississippian rocks underlie the outwash and outcrop in the bluffs. Deposits of the Kansan and probably the Nebraskan glacial stages overlie the rocks on the uplands on both sides of the river. Terminal moraine and outwash deposits of the Illinoian glacial stage are also found on the bluffs on the Illinois side. A variable thickness of loess overlies the glacial deposits.

The flood plain is generally silty clay with decayed vegetable matter a few to several feet thick, of loess and glacial drift eroded from the uplands and deposited during centuries of recurrent high water periods to form a very fertile soil. Most of the flood plain is now protected from overflow by levees.

Four minor creeks and one small tributary river - the Wyaconda in Missouri - join the waters of the Mississippi River within the pool limits. These streams have rapid response to heavy rainfall and runoff, and have some effect on pool levels. Sediment deposits from entering streams may create localized problems for resource management.

Numerous islands, some among the largest within the Rock Island District, are located in Pool 21. The islands, along with low-lying mainland areas riverward of the levee system, on the river banks, support a generally heavy timber and other vegetative growth.

3. Lock and Dam No. 21. The existing structure, located at river mile 324.9, is the eleventh of the twelve navigational structures progressing in a downstream sequence within

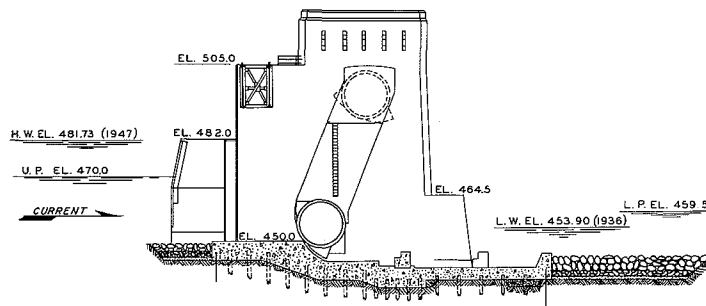
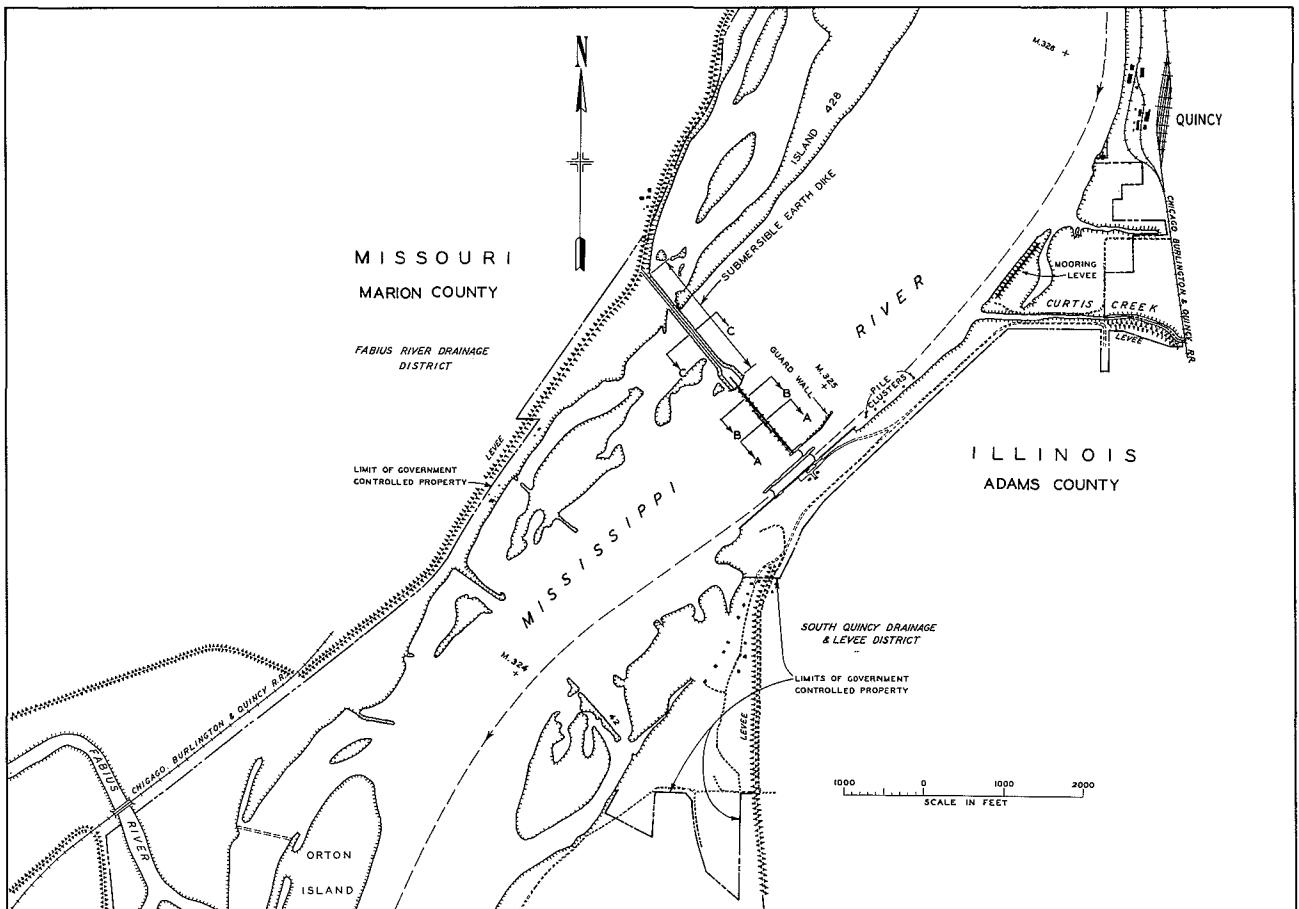
the established limits of the Rock Island District of the Corps of Engineers. A 110-foot by 600-foot lock and completed upper gate section of a future auxiliary lock lie adjacent to the Illinois shore. The dam consists of a movable gated section and a stretch of overflow earthen dike extending to a levee along the Missouri shore. The movable gate section contains 3 roller gates and 10 tainter gates which are adjusted as necessary to maintain the pool at the authorized elevation when low and medium low-flow conditions prevail. During periods of higher flows the gates are removed from the water.

A plan and location map of the navigational installation is shown on plate II-2.1 and on Chart No. 58 of the Upper Mississippi River navigation charts.

4. Pool 21. Extending in a generally northerly direction, the pool is 18.3 river miles in length - one of the shorter of the series within the Rock Island District. The Mississippi River basin drainage area totals 135,000 square miles at the dam and the pool varies in width from 2,000 to 12,000 feet between the Missouri and Illinois shores at the authorized elevation (flat pool) of 470.0 feet above mean sea level (1912 adj.).

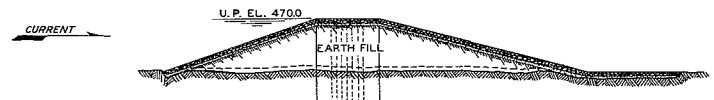
The lowest pool water elevation observed at the dam, since the dam became operable, was recorded at elevation 467.5 or 2.5 feet below the authorized flat pool level. The record high water elevation at the dam was established on 28 April 1965 at 482.69 feet above mean sea level or 12.69 feet above the authorized flat pool elevation.

Maintenance dredging has been somewhat general throughout the pool although the major activity has been in the mid and extreme upper reaches. A total of 5,125,555 cubic yards of material has been removed from the channel since the pool was formed. Spoil disposal did not benefit existing or suitable future recreational development sites.

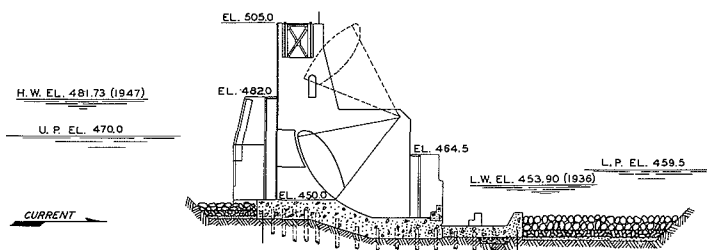
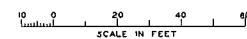


SECTION A-A

NOTE:
 AVAILABLE DIMENSIONS OF LOCKS:
 MAIN LOCK 600' X 110'
 AUXILIARY LOCK 360' X 110' (FUTURE)
 CONTROLLING DEPTH 12' AT NORMAL POOL
 NORMAL LIFT 10.5 FEET.



SECTION C-C



SECTION B-B

REFERENCES:
 1. ELEVATIONS BASED ON MEAN SEA LEVEL DATUM (1912 ADJUSTMENT).
 2. RIVER MILEAGE ORIGINATES AT MOUTH OF OHIO RIVER.

**MISSISSIPPI RIVER
 RIVER AND HARBOR PROJECT
 LOCK & DAM NO. 21
 NEAR QUINCY, ILLINOIS**

SCALE AS SHOWN
 ROCK ISLAND DISTRICT
 30 JUNE 1953

SECTION III

POOL RESOURCES

1. General. In this section the existing physical resources of the pool are examined and considered on both a qualitative and quantitative basis. Resource usage, present and projected management programs, and recommended developments are determined from such factors.

As noted in chapter I, paragraph 7b, II-5, acreage quantities have been calculated from master plan maps for purposes of recreation and general land-use planning, and are not to be accepted as accurate for legal purposes. Significant variance may exist between the acreages given and the official records maintained by the Real Estate Division of the Rock Island District Office.

2. Water. The general characteristics of both a river and a shallow lake are present in pool waters which total 6,350 surface acres at the authorized flat pool elevation. Approximately 917 surface acres, or 14% of the total, are considered as channel waters with a minimum depth of 9 feet. The remaining 5,433 surface acres, or 86% of the total, are classified as off-channel waters, vary in depth, and may present navigational hazards to recreational boating - especially in the upper pool reaches.

3. Land. The Federal Government acquired 8,627 acres of shore and island real property in fee for the 9-foot channel project within the limits of Pool 21. Of this total 8,450 acres remain above the water surface at the authorized flat pool elevation and embody 3,290 acres of mainland property and 5,160 acres of island real estate. Identifiable land accretions, between the initial operation of the dam and 1964, amount to 86 acres in several island locations designated as Federal property. Accretions to the privately-owned upper portion of Dillon Island, river mile 341.8, have enveloped two small islands, originally acquired in fee by the Federal Government, and added the property to the large island body.

Prior to project construction the Federal Government owned certain Mississippi River lands which were assigned to the Department of the Interior and administered by the Bureau of Sport Fisheries and Wildlife. No such areas existed within the present limits of Pool 21, however. Since completion of the 9-foot channel project the Corps of Engineers, as administrator of Federal fee property associated with the pool, has outgranted 6,028 acres of land to the Bureau for

fish and wildlife management purposes under the provision of a General Plan and Cooperative Agreement. Basic administration, however, remains a Corps function.

Flat pool shoreline, mainland and islands, totals approximately 146 miles with miles owned by the Federal Government and administered by the Corps of Engineers. Federally-owned shoreline includes 61 miles of mainland and 60 miles of island shoreline while non-Federal ownership is represented in 15 miles of mainland and 10 miles of island shoreline.

Some 50 islands, totaling 5,807 acres in area, lie within the pool limits. Forty five islands, with an area of 5,160 acres, are under Federal ownership and administered by the Corps of Engineers. A wildlife sanctuary of 29 shoreline miles has been established by the Bureau of Sport Fisheries and Wildlife on island land outgranted by the Corps.

Certain Federal lands may be leased, generally for renewable 5-year periods, to private individuals for agricultural purposes. One such lease, covering 5.2 acres, is presently in force in the pool area.

4. Vegetation. The major portion of Federal lands within the pool area support timber stands and other vegetative growth tending towards a dense classification. A cover of medium to dense growth occupies 78%, or 6,510 acres of Federal property while another 1/2 of 1%, or 54 acres, is sparsely covered. No appreciable growth is present on 21½%, or 1,886 acres classified as open. Islands, especially, support a generally profuse growth.

Timber association differ somewhat from upstream pools inasmuch as pecan species now appear in addition to those which have been relatively common and constant. Predominant species remain cottonwood, willow, maple, red birch, and locust on the lower areas with ash, American elm, hickory, oak, hackberry, and linden occupying the somewhat higher land elevations. Dutch elm disease has taken a considerable toll of the American elm within the pool and the Rock Island District. A program for the removal of diseased trees, however, would not be feasible.

A timber management program, originating in 1941, directs the select harvesting of mature specimens. Contracts granted to private interests between October 1950 and March 1967 accounted for 1,863,048 board feet of lumber with an income to the Federal Government of \$60,246.40. The long-range

management objective, which is being realized is towards increased annual yields, quality improvement, and specie composition enhancement.

5. Wildlife. Pool lands and waters offer especially favorable habitats for a wide variety of wildlife species with protected sloughs and backwaters, open grass areas, and varying degrees of brush and timber cover. Some 4,440 acres - more than half of total pool land under Federal title - are restricted as a wildlife sanctuary under the management of the Bureau of Sport Fisheries and Wildlife. The total sanctuary areas of 5,490 acres include 1,050 surface acres of pool waters.

a. Birds. As a part of the "Mississippi Flyway" the pool is attractive to vast numbers of migratory aquatic birds with numerous sloughs and backwater areas offering sheltered feeding and resting opportunities. Some 19 species of ducks and 4 species of geese are yearly visitors during the spring and fall migratory flights. The wood duck is a summer resident in the pool area and mallard, blue-winged teal, and hooded merganser may nest on occasion. The American egret, coot, bittern, grebe, and gull as well as numerous other species of shorebirds and songbirds are either residents or transients. Several species of hawks and owls are fairly common to the pool area and the bald eagle is often observed.

b. Animals. Common small mammals to be found in the pool area include skunk, raccoon, weasel, opossum, mink, muskrat, beaver, fox, squirrel, rabbit, woodchuck, and river otter. The coyote is also occasionally reported.

The only large game animal now inhabiting the region is the white-tailed or Virginia deer, although bear and elk were present in the times of the early settlers. The deer, presently found in the timbered bottomlands and on the large islands, has wide distribution but is not considered as numerous.

The muskrat is common to abundant although numbers vary seasonally depending on water conditions and elevations. Squirrel and raccoon are generally abundant, but are subject to changing habitat conditions resulting from fire, flood, timber harvesting activities, and available food supplies. Beaver, mink, and otter are relatively low in numbers and likely are stable in concentration. Populations of other small animals are fairly high in numbers, and are probably stable.

Several varieties of harmless water snakes inhabit pool waters, especially in the slough and backwater areas. Poisonous reptiles which may be found on land areas - once fairly common, but now seldom encountered - are the massasauga and timber rattlesnake and the copperhead.

6. Fish. Although pool waters offer a good habitat for fish, the region is not especially noted for fishing activities. The catch reported for 1970 was only 49,850 pounds in the sport fishing category and 95,500 pounds taken by commercial fishermen - both far below figures recorded in northern pools of the Rock Island District.

No creel census is available for the pool, but sport fishermen concentrate on walleye, northern, sauger, bluegill, crappie, bass, freshwater drum, channel catfish, and bullhead. The commercial catch is mainly carp, buffalo, freshwater drum, paddlefish, and channel catfish. Mississippi River carp and buffalo are especially popular in eastern retail markets.

7. Recreation. Comparatively little of the recreation potential within the pool limits has been realized. Road access is largely lacking and the protective levee system along or near the river shores throughout most of the pool further restricts ready access to Federal lands. One sizeable public use area has been developed by the Corps of Engineers with considerable space for expansion. Another and smaller area is also maintained by the Corps with little or no room for expansion because of leased space for private use both upstream and downstream of the installation.

8. Historical and archaeological. Indian Grave Drainage District, protected by levees and located adjacent to the major portion of pool shores in Illinois, is named for a large Indian burial mound existing within the area.

LaGrange, Missouri, was the boyhood home of Thomas A. Marshall, Vice President of the United States in the 1913-21 period of the administration of Woodrow Wilson.

A Sauk Indian village was located on a wide, sweeping bend of the Mississippi River on land destined to become a part of the future State of Illinois. Early traders visited the village regularly to barter with the Indians for furs. The first permanent white settler, a New Yorker named John Wood, arrived in 1822 - two years after Illinois was admitted as a state. Wood, who was to become the twelfth governor of Illinois, was soon joined by other settlers and a community known as Bluffs was established by the residents.

A new President of the United States, John Quincy Adams, was inaugurated on 4 March 1825. To honor the new president, the 10 residents of the hamlet of Bluffs assembled on this day and changed the name of the community to Quincy. A county named Adams was established, with Quincy as the county seat, and the public square in Quincy christened John's Square - thus completing presidential honors.

A page in the tragic history of the Mormons was written in Quincy during the winter of 1838-39. Joseph Smith and his Mormon followers, driven from their homes in Missouri, found refuge and kindness among the Quincy citizens before moving on in the spring of 1839 to Commerce which they renamed and developed into the remarkable city of Nauvoo.

Stephen A. Douglas presided as a judge of the Circuit Court in the Quincy of the early 1850's and was later elected to the House and then the Senate from the District. The sixth of the famous Lincoln-Douglas debates was held in John's Square (now Washington Park) in 1858.

Orville H. Browning, a resident of Quincy, was Secretary of the Interior during the administration of President Andrew Johnson.

Indian Mounds Park, in Quincy, preserves several hundred burial mounds. Excavations have uncovered archaeological treasures of great scientific and historic value.

SECTION IV
FACTORS AFFECTING RESOURCE USE

1. General. Pool 21 is another of the series of man-made pools created to provide a minimum 9-foot navigable depth on the Upper Mississippi River. Plate IV-2.1 graphically demonstrates commercial use of Lock No. 21 through a period of nearly two decades of river traffic. Recreation facilities are not extensive, although considerable potential is present. Lack of roads and the barrier of protective levees preclude ready access to pool waters except in areas of population concentration.
2. Zone of influence. The primary zone of influence is considered as an area two counties in width, or approximately 50 miles, extending inland on each side of the river and following the length of the stream within the Rock Island District. Chapter I lists the approximate total 1960 census population of such zones bordering each shore of the river. A population estimate by pools, however, is considered impractical since a given pool usually spans portions of several counties. One major city is located on pool shores in Illinois and the river serves two smaller communities in Missouri. Census figures for 1960 indicate a population of 47,583 in Quincy, Illinois; 1,347 for LaGrange, Missouri; and 2,562 for Canton, Missouri. Residents of or visitors to Quincy, Illinois, and Canton, Missouri, have the recreation facilities of two pools at their disposal since each community lies adjacent to a dam.
3. Economic conditions. The pool area, landward of the protective levee system, is an important agricultural region in both Illinois and Missouri. Several commercial and industrial docks are established along the riverfront at Quincy, Illinois, and other docks are served by the river at LaGrange and Canton, Missouri. Waterfront recreational facilities are established at Canton and LaGrange and at several sites at Quincy.

No State or county parks are located on pool shores in Missouri. A major State park recreational development, however, is located on an island adjacent to Quincy with access from the mainland across a foot bridge. Also a recently constructed cable-car tramway allows access to the island. There are no county parks located on pool shores in the State of Illinois.

Federal lands reserved for industrial development are located along the Illinois shore on the downstream outskirts

of the city of Quincy (river miles 325.4 - 325.8). Only 5.3 acres of the 49-acre area is presently leased and occupied. Studies, presently being conducted, seek to discover ways and means of providing full-year navigation activities. Winter time commercial navigation throughout pool 21 generally prevails. However, extreme cold weather conditions can and do frequently halt passage. Should a successful method be developed, industrial interest in the available property may be quickened.

4. Accessibility. Although a railroad follows near the Missouri shore throughout the length of the pool, no passenger service is offered between LaGrange and Canton or upstream or downstream points. Passenger service is available to and from Quincy, Illinois, on east and west lines. Bus passenger transportation is, however, available between the three population centers. Quincy, Illinois, is served by scheduled air flights at a traffic-controlled airport. No other air fields, either commercial or private, are located in the immediate area of pool lands.

A number of access points to pool waters exist at the three areas of population concentration. In rural areas of Illinois five access roads for public use lead to pool shores with all leading to or adjacent to Federal property. In the rural areas of Missouri such access roads do not exist; however, there are two roads across private property which have access to the pool shore, with one leading to Federal property.

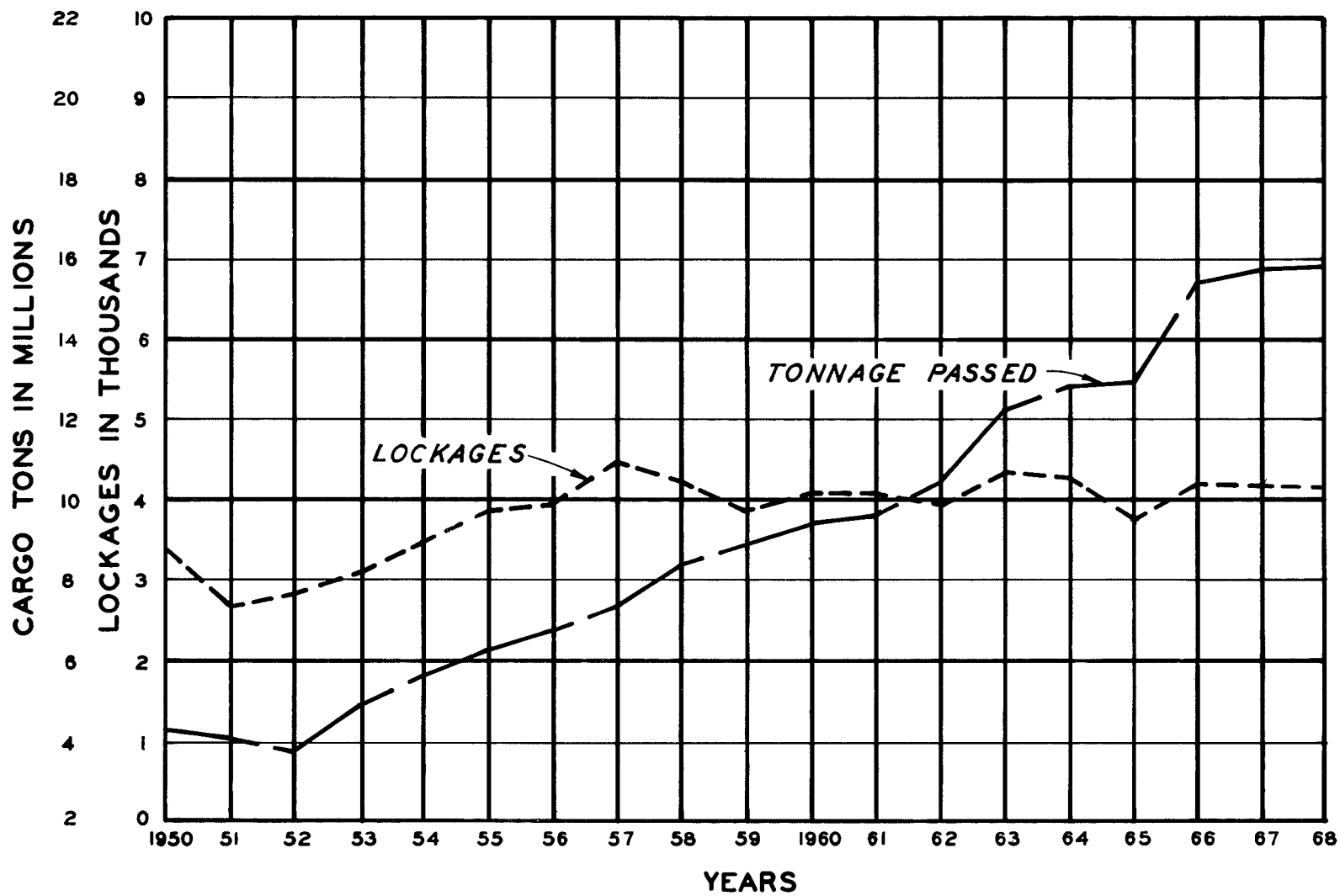
The Great River Road is being planned to eventually follow closely both shores of the river from the Canadian border to the Gulf of Mexico to provide an outstanding scenic attraction. Along pool 21, however, the route affords only brief views of the Mississippi River between Canton and LaGrange, Missouri. If the full scenic objective is to be achieved the road will eventually need to be relocated along the crown of the levees which follow along or near the major stretch of pool shores.

A sightseeing excursion boat, berthed at Quincy, operates on pool waters during the recreational season.

At Quincy a high-level fixed span highway bridge and a high-level fixed span railroad structure cross the river between Illinois and Missouri. The railroad crossing is of recent construction and replaces a former downstream draw span bridge.

5. Existing recreational facilities.

a. Two of the 25 public recreation areas, established and maintained by the Corps of Engineers on the Mississippi River



LOCK NO. 21

within the Rock Island District, are located on the shores of Pool 21. The relative location of the areas, both in Illinois, are shown on plate IV-4.1.

(1) Bear Creek Public Use Area. The site is located at river mile 340.8, approximately 4 miles off State Highway 96, southwest of Marcelline, Illinois. The 5-acre area, plate IV-4.2, lies riverward of the levee with available space for further expansion. Present recreational facilities provided include a concrete boat launching ramp, 2 wells, 17 picnic tables, 8 pedestal fireplaces, 10 trash containers, 3 fire rings, and 2 pit toilets. No defined or improved parking areas are presently established. Approximately 1 mile of graveled access and circulation roadway has been constructed to serve the facility.

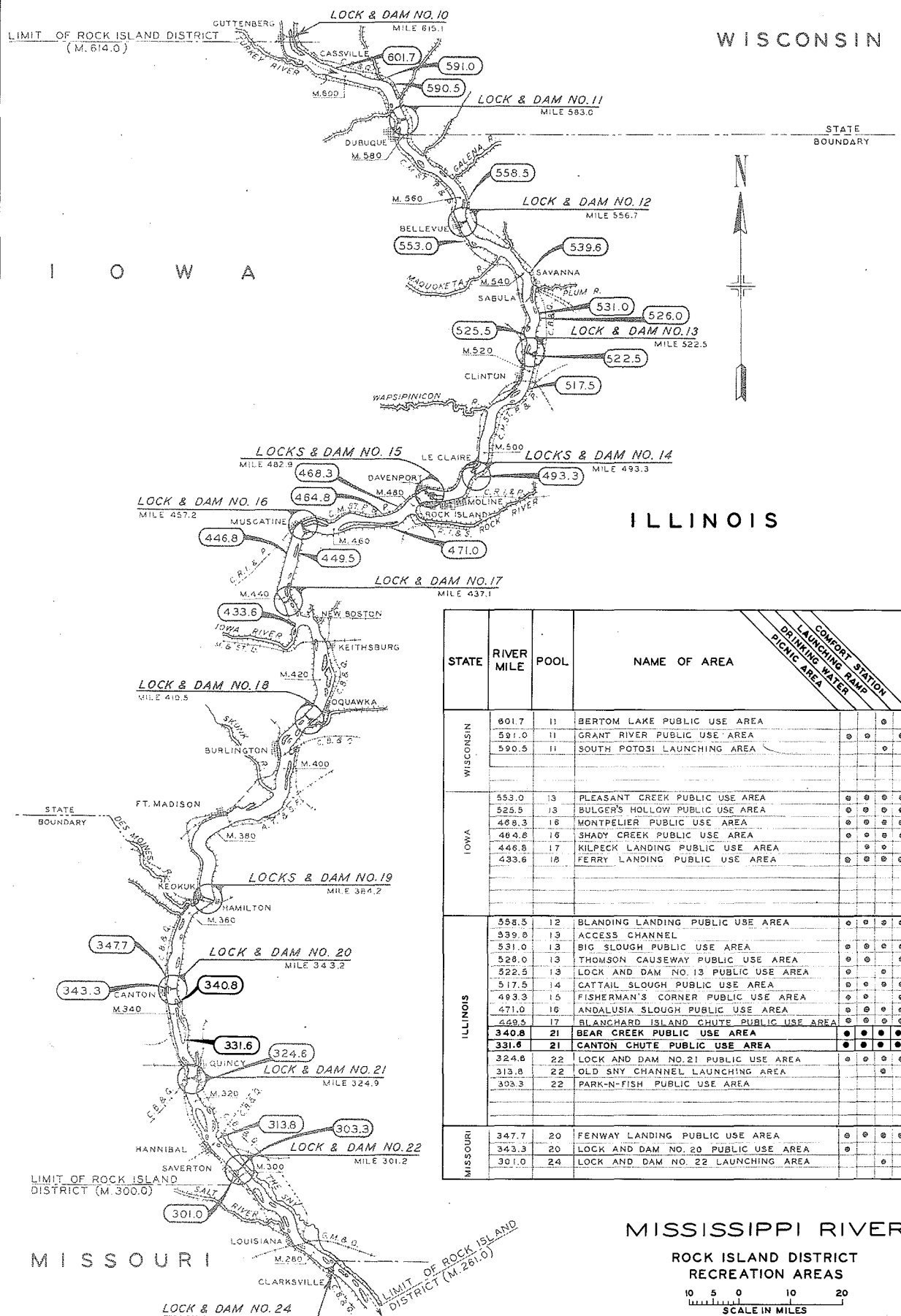
(2) Canton Chute Public Use Area. A small area of only 1½ acres, plate IV-4.3, is located at river mile 331.6 a short distance upstream of Quincy, Illinois. Only limited expansion, removed from the river, can be accomplished because of leased cottage site tracts on Federal property both upstream and downstream of the developed area. Present facilities include a graveled boat launching ramp, 8 picnic tables, 4 pedestal fireplaces, 11 trash containers, a well, and 2 pit toilets. A defined and graveled parking area provides space for approximately 40 passenger cars.

b. Except as noted, all other existing recreational developments within the pool boundaries are located on non-Federal shore property within corporate community limits. Non-Federal recreational sites are established at Canton, Missouri - a municipal ramp, river mile 342.9; at LaGrange, Missouri - a commercial boat concession, river mile 335.9; at Quincy, Illinois - a small State park, river mile 328.7; a city recreational development, river mile 327.8; a municipal launching ramp, also at river mile 327.8; a commercial boat concession, river mile 327.7; a boat club, river mile 327.4; and a municipal launching ramp, river mile 327.2. A boat launching ramp, river mile 328.7, established by the Illinois Department of Conservation in the Sid Simpson State Park outside the corporate limits of the city of Quincy, is the only developed facility located on Federal land. The government land in this area had been licensed to the Illinois Department of Conservation. However, no other public recreational facilities have been developed as yet. A commercial concession site exists on Federal land at river mile 331.7 near the Canton Chute Public Use Area. A concrete boat launching ramp is the only facility provided at the site which is not located on the navigation chart base map.

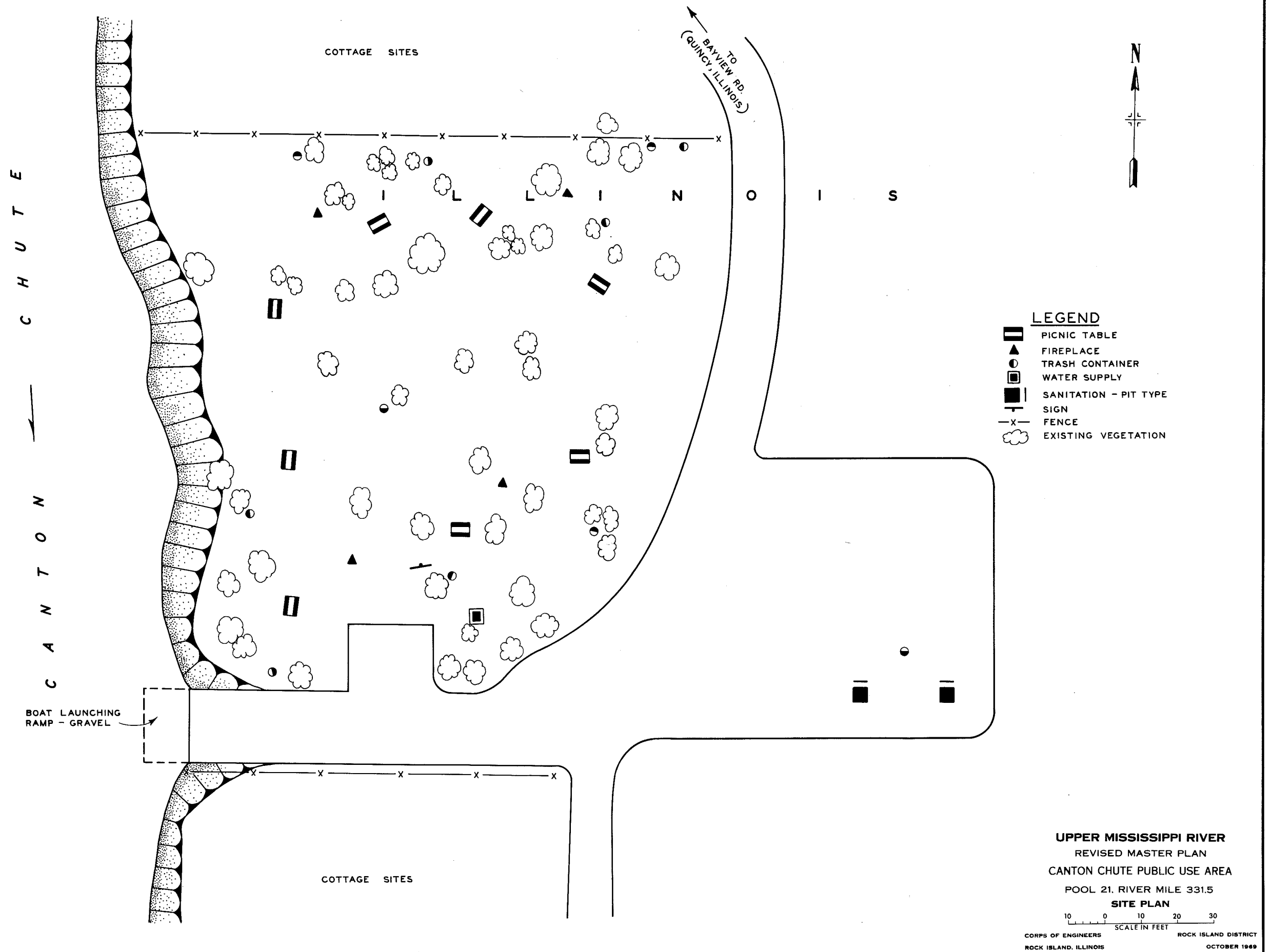
6. Water quality. The quality of the water throughout the pool is considered adequate for most forms of water-oriented recreation. Municipal and industrial pollution sources are restricted to the vicinity of Quincy, Illinois, but are not excessive. Existing levees and the absence of a major tributary stream entering the pool preclude excessive agricultural pollution, however, discharge from drainage district pumping stations and drainage ditches may create areas of intensive pollution.

7. Climatic conditions. Yearly precipitation averages 36 inches and the growing season extends over a period of 186 days between early April and mid-October. In the last decade pool area temperatures have ranged from a low of -15°F. to a high of 101°F. although neither has been an extreme of record. The mean annual average temperature is 52°F. with a summer average of 75°F. and a winter average of 28°F. Prevailing winds are from the south and southwest during the summer months and from the northwest in the winter period.

Until recently navigation was normally halted by ice by mid-December and was resumed by early March. Increasingly powerful towboats, however, are now able to operate under ice conditions and are tending to prolong fall activities as well as resume at an earlier period towards the end of winter. Studies are presently underway by the Corps of Engineers on the feasibility of year-round navigation.







SECTION V

CURRENT AND ANTICIPATED RECREATIONAL USE

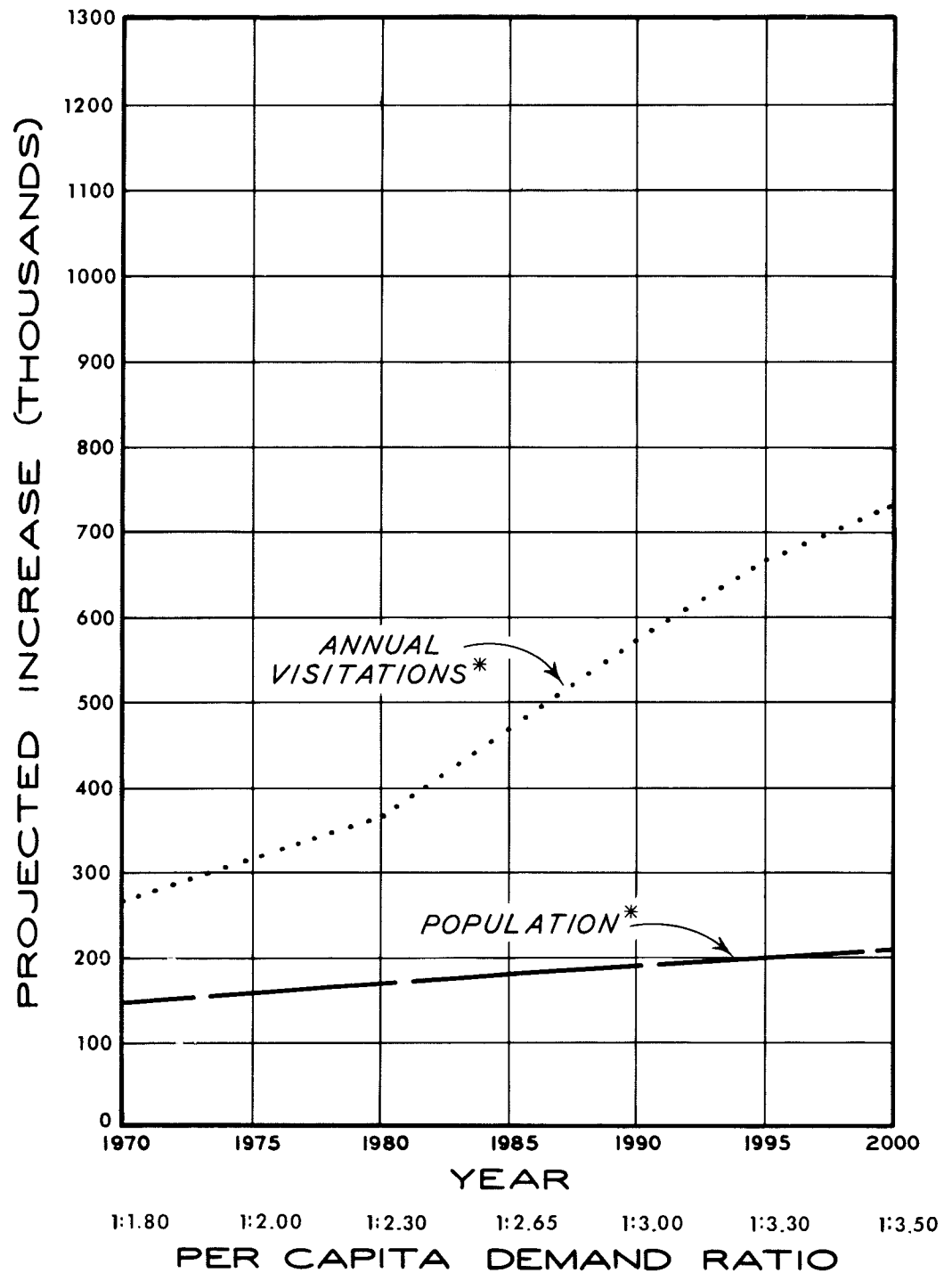
In Pool 21 annual recreational visits attained a figure of 307,920 in 1970. Thus Pool 21 stands eighth in the Rock Island District in relation to recreational attendance. In the year 1970 attendance ranged from a high of 44,980 in July to a low of 8,235 in December. Peak day attendance was calculated to be 11,050.

The cities of Quincy, Illinois, and Canton and LaGrange, Missouri, are located on the 60 miles of shoreline adjoining the pool.

Plate V-1.1 presents the expected population increase and corresponding recreational demand within the primary zone of influence - an area two counties in width (approximately 50 miles) reaching inland on each side of the pool. The per capita demand ratio is calculated on the 1970 population, and visitations reported in the past. A constant increase in annual visitations is projected until 1980 when a sharp increase in rate of visitations will follow until the projected year 2000.

Plate V-1.2 tabulates pool recreational facilities presently developed or proposed by both Federal and non-Federal agencies or individuals. Non-Federal sites are limited to those immediately adjacent to the river and may or may not be located on lands leased from the Federal Government. Proposed non-Federal development are those known to be scheduled for completion in the near future.

Total imperative needs for future demand is predicated on expected population and public recreation participation. Projected facility developments, to serve an increasing population and demand, are calculated from criteria contained in ER 1130-2-312. On this supposition adequate facilities are neither existing nor presently proposed.



* PRIMARY ZONE - AREA TWO COUNTIES
IN WIDTH (APPROX. 50 MILES) EXTENDING
INLAND ON EACH SIDE OF POOL.

POOL 21
MISSISSIPPI RIVER
PROJECTED
POPULATION & VISITATIONS

POOL 21
1969 EXISTING AND PROPOSED FACILITY DATA

	EXISTING FEDERAL FACILITIES	EXISTING NON-FEDERAL FACILITIES	TOTAL EXISTING FACILITIES	RECOMMENDED FEDERAL FACILITIES	PROPOSED NON-FEDERAL FACILITIES	TOTAL PROJECTED FACILITIES	* TOTAL REQUIREMENTS FOR ANTICIPATED DEMAND			
							1970	1980	1990	2000
<u>DAY - USE</u>										
PARKING (UNITS)	25	25	50	0	0		67	92	142	183
PICNIC TABLES	25	63	88	0	0		67	92	142	183
FIREPLACES	12	30	42	0	0		33	46	71	91
POTABLE WATER	3	4	7	0	0		2	3	4	6
SHELTERS	0	2	2	0	0		20	27	42	54
<u>BOAT LAUNCHING</u>										
PARKING (UNITS)	8	75	83	0	0		60	90	140	180
RAMPS	2	6	8	0	0		6	9	14	18
CONCESSIONS, FUEL, ETC.	0	2	2	0	0		—	—	—	—
<u>SANITATION</u>										
PIT TOILETS	4	6	10	0	0		2	4	6	8
FLUSH TOILETS	0	4	4	0	0		NONE PROPOSED UNDETERMINED			
TRAILER STATIONS	0	0	0	0	0					
<u>CAMPING</u>										
PARKING	10	0	10	0	0		36	49	76	97
PICNIC TABLES	0	0	0	0	0		36	49	76	97
FIREPLACES	0	0	0	0	0		36	49	76	97

NOTES:*** BASED ON ER 1130-2-312 CRITERIA:**

- 1 PICNIC TABLE PER 4000 ANNUAL VISITORS
- 1 PARKING SPACE PER TABLE
- 1 FIREPLACE PER 2 DAY-USE PICNIC TABLES
- 1 FIREPLACE PER CAMP SPUR
- 1 SHELTER PER 225 WEEK-END DAY VISITORS
- 1 LAUNCHING RAMP PER 40,000 ANNUAL VISITORS
- 10 CAR-TRAILER PARKING SPACES PER RAMP
- 2 PIT TOILETS PER 3000 WEEK-END DAY VISITORS
- 1 CAMP SPUR PER 7500 ANNUAL VISITORS

1. Primitive camping is permitted on unreserved Federal property shorelands, islands and sandbars.
2. No supervised river swimming areas are in operation.
3. Road access to the river exists at 9 rural locations within the 61 miles of mainland shoreline.

SECTION VI

POOL RESOURCES MANAGEMENT

1. General. The stated purpose of a Master Plan directs analysis and examination of existing physical features of the pool in addition to proposals for the utilization and development of the scenic, biologic, and recreational potential. The management program considers these factors and is designed for orderly and controlled resource protection and development.

2. Land use zoning. Section VI, chapter I, describes and outlines zoning classifications which have been established to meet the criteria of a Master Plan development. Lands under fee ownership to the Federal Government, both mainland and island property, are extensive throughout the pool reach and basic administration is the assigned responsibility of the Corps of Engineers.

Of the 8,450 acres of Federal land at the authorized flat pool elevation - 93%, or 7,897 acres, are classified as recreational-undeveloped and 5%, or 409 acres, as recreational-developed. The remaining 2% is divided between recreational-commercial, 10 acres; quasi-private use, 18 acres; private use, 65 acres; special use, 2 acres; and industrial use, 49 acres. No houseboat mooring sites have been classified or reserved.

No Federal fee lands in the pool area are assigned to the Department of the Interior for administration by the Bureau of Sport Fisheries and Wildlife. However, the Corps of Engineers has made available 6,028 acres of Corps administered land to the Bureau for fish and wildlife management under the provisions of the General Plan and Cooperative Agreement. The Bureau has established a wildlife sanctuary on a large group of islands and adjacent water areas.

3. Water zoning. Detailed water zoning is not presently a matter of consideration in master planning for the pool. However, it will likely become a necessity in the future - at least in certain areas - as population and water-oriented recreational activities continue to mount as anticipated.

Off-channel waters occupy 5,433 surface acres of the total 6,350 surface acres of the pool at the authorized flat pool elevation. Beyond the established and minimum 9-foot channel, such off-channel areas may present navigation hazards to pleasure boat operations - especially in the upper reaches of the pool. However, it is considered impractical to publish

water depths in areas of potential hazards, such as submerged wing dams and stump fields, since varying currents, shifting sandbars, and any fluctuation in pool levels would render such information generally inaccurate.

4. Timber management. Subsection 3 of Section VIII, chapter I, describes the forestry resource existing on Federal lands within the Rock Island District and administered by the Corps of Engineers. Each base map of the Master Plan for Pool 21 features a transparent overlay on which is delineated the type and location of forestry cover, management objectives, timber species associations, and related information.

The management program, currently being restudied, may modify or revise certain objectives presently established. Of the 8,450 acres of Federal land in the pool area, 6,564 acres support significant timber stands and are classified under management objectives. Six percent, or 394 acres, are presently assigned as recreation-developed; 75%, or 4,726 acres, as wildlife-waterfowl; and 22%, or 1,444 acres, as wildlife-upland game. No recreation-undeveloped, timber-sawlogs, timber-pulpwood, or timber special products categories are recognized.

5. Wildlife management. Prior to the construction of the 9-foot channel project, certain Mississippi River lands were owned in fee by the Federal Government, assigned to the Department of the Interior, and managed by the Bureau of Sport Fisheries and Wildlife. Within the present limits of Pool 21, however, no previous ownership of land by the Federal Government had existed. All fee lands acquired for the navigation project were assigned to the Corps of Engineers for administration and management. The Corps has subsequently outgranted the major portion of such property to the Bureau of Sport Fisheries and Wildlife for wildlife management purposes under the provisions of the General Plan and Cooperative Agreement. The Bureau has, in turn, outgranted certain of these areas to the States for wildlife management only. In either case the Corps of Engineers retains basic administration, the right of road use, and the control and sale of merchantable timber.

6. Shoreline ownership. The Federal Government has fee ownership of 121 shoreline miles of the 146 miles of combined mainland and island shore property at the established flat pool water elevation. Sixty miles are represented by island shoreline and 61 miles are mainland property along the shores of Missouri and Illinois, all administered by the Corps of Engineers of the Rock Island District. Twenty-five miles of pool shoreline are not under Federal control and are represented in 15 miles of mainland and 10 miles of island property.

7. Additional recreational developments.

a. Corps of Engineers. No additional sites are recommended or are under active study at the present time.

b. Bureau of Sport Fisheries and Wildlife. The Bureau does not manage any fee land within the pool for the Department of the Interior and is not qualified to sponsor recreational developments on lands outgranted for fish and wildlife management by the Corps of Engineers.

c. States.

(1) Illinois. The Department of Conservation has no present plans to request the use of additional Federal lands for recreational developments within the pool area.

(2) Missouri. The Department of Conservation in the State of Missouri does not expect to request the use of Mississippi River lands along pool 21 for public recreational development.

d. Counties.

(1) Adams (Illinois). Although State law permits the establishment of county conservation boards, Adams County has no such organization.

(2) Lewis and Marion (Missouri). No county conservation boards exist within the State of Missouri.

e. Municipal

(1) City of Canton, Missouri. Suitable Federal land for recreational development is available immediately downstream of Canton, but is without road access. The city does not presently plan to seek the use of such Federal property.

(2) Town of LaGrange, Missouri. Considerable Federal land exists immediately upstream of LaGrange, but is without road access. The population of the community is probably not sufficient to warrant the costs involved in providing access and developing a recreational area.

(3) City of Quincy, Illinois. Among river cities, Quincy is unusually recreation conscious with several waterfront sites in addition to a major development on an adjacent island. Residents and visitors also have the use of the facilities of a small State park, part of which is Government land outgranted to the State and located immediately upstream of the north city limits. City officials are studying the recreational

potential on a 2-mile stretch of Federal riverfront land (river miles 329-331), and they have expressed an intent to submit development plans to the Corps of Engineers for approval, and plan to seek the necessary permits and leases.

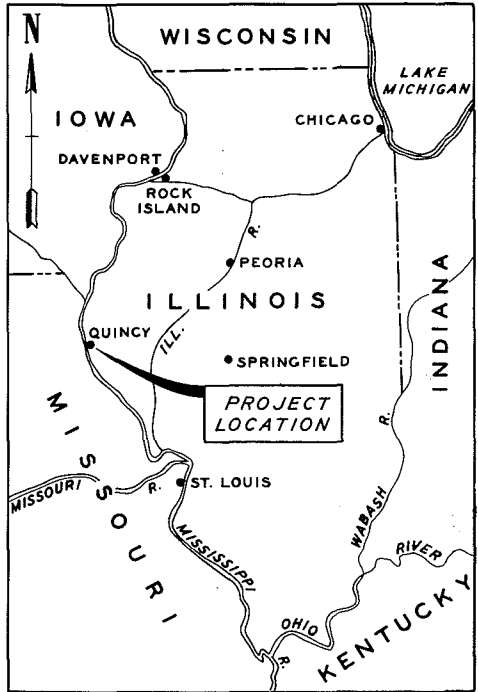
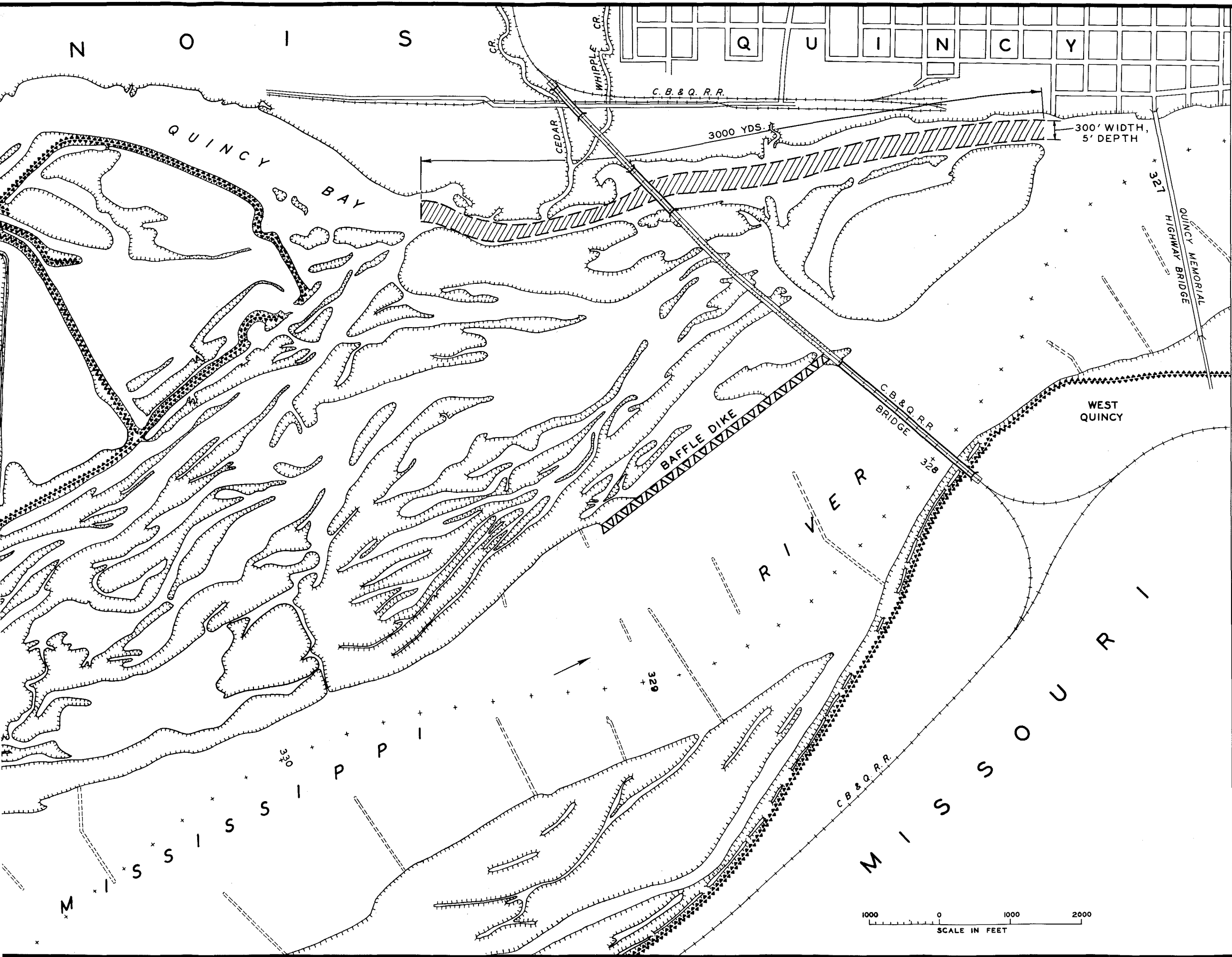
The Federal Government has been active in three recreational projects of a navigational nature in the Quincy area:

(a) The River and Harbor Act of 1962 authorized Federal maintenance of an existing boat harbor in Quincy Bay. Periodic dredging, plate VI-4.1, has been accomplished as required.

(b) A small-boat harbor in Squaw Chute in Quincy Bay, authorized under Section 107 of the 1960 River and Harbor Act, plate VI-4.2, was completed in 1966.

(c) An access channel, 6,000 feet in length and with a bottom width of 50 feet, was authorized across Bay Island between the Mississippi River and Quincy Bay by Section 107 of the 1960 River and Harbor Act. The channel, plate VI-4.3, was completed in 1969.





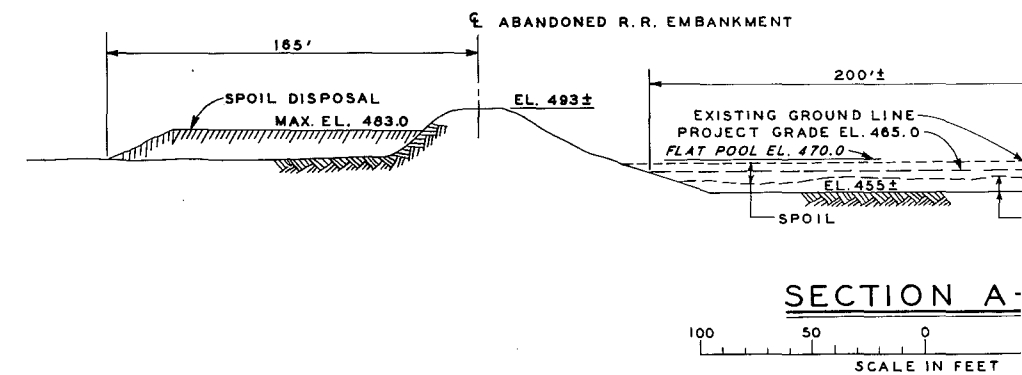
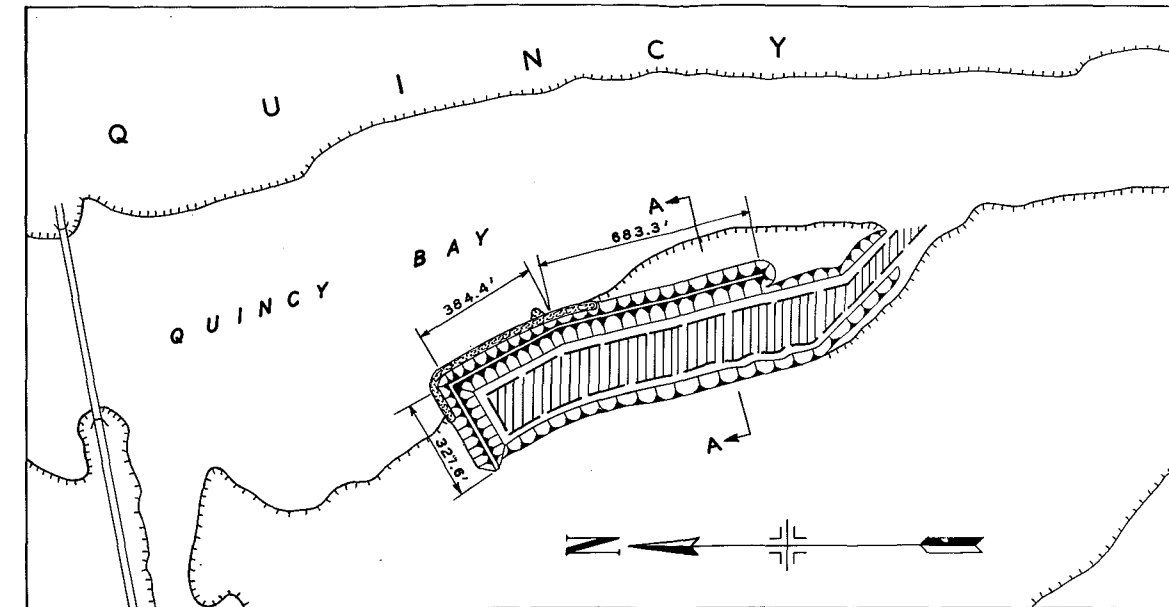
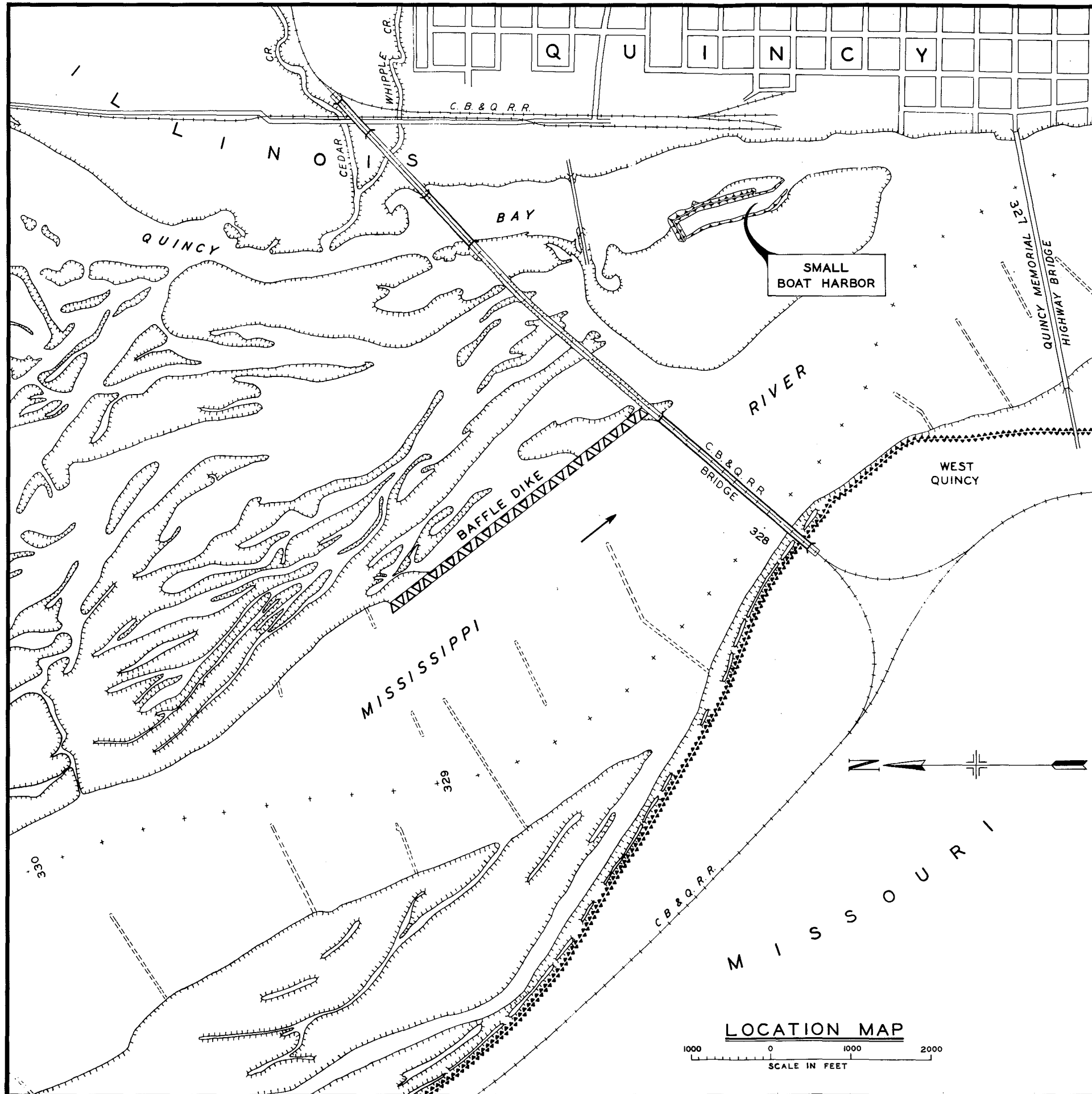
VICINITY MAP
25 0 25 50 75
SCALE IN MILES

LEGEND
 MAINTENANCE DREDGING

NOTE
MILEAGE ORIGINATES AT MOUTH OF OHIO RIVER

1000 0 1000 2000
SCALE IN FEET

MISSISSIPPI RIVER
RIVER AND HARBOR PROJECT
QUINCY, ILLINOIS
SMALL BOAT HARBOR
SCALES AS SHOWN
ROCK ISLAND DISTRICT
30 JUNE 1963

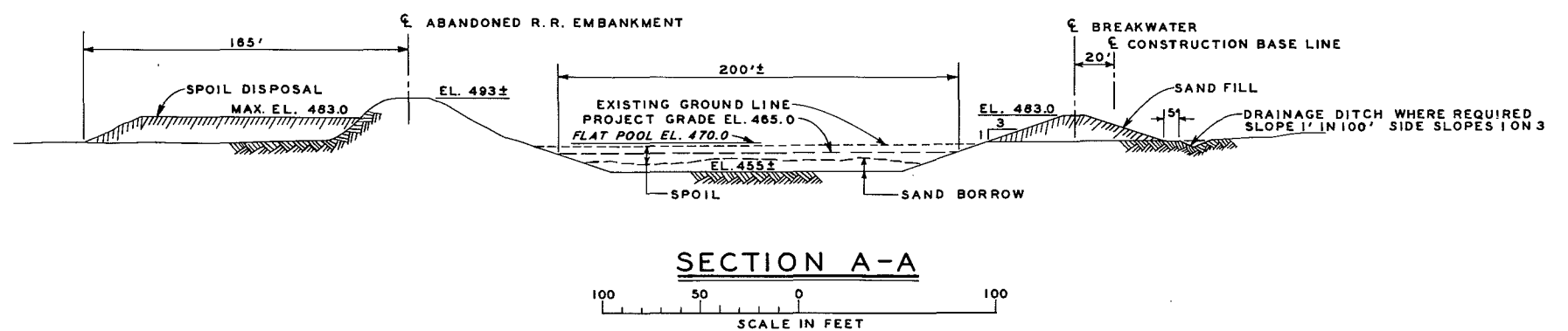
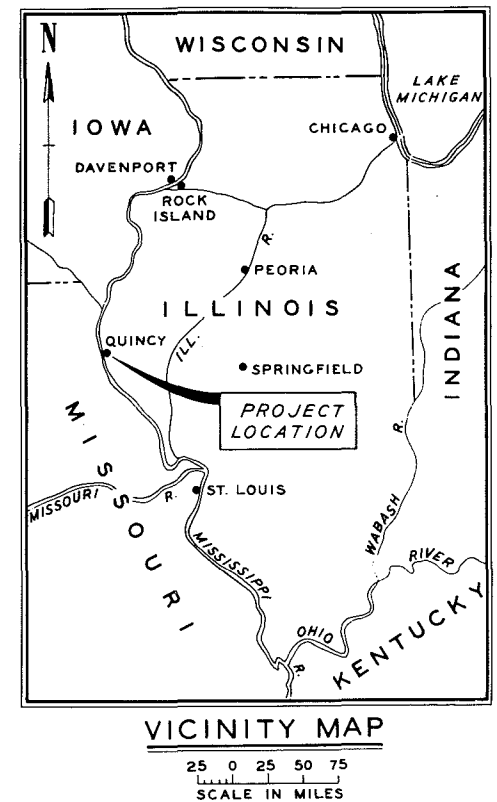
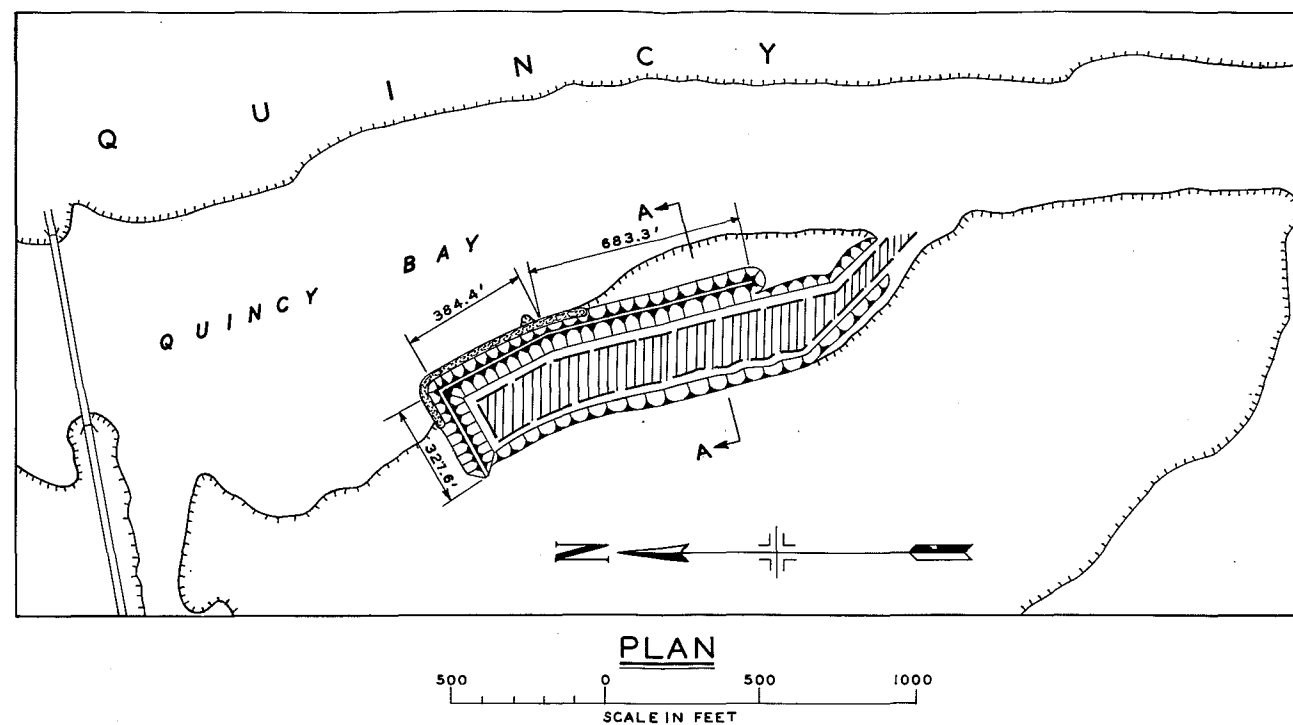
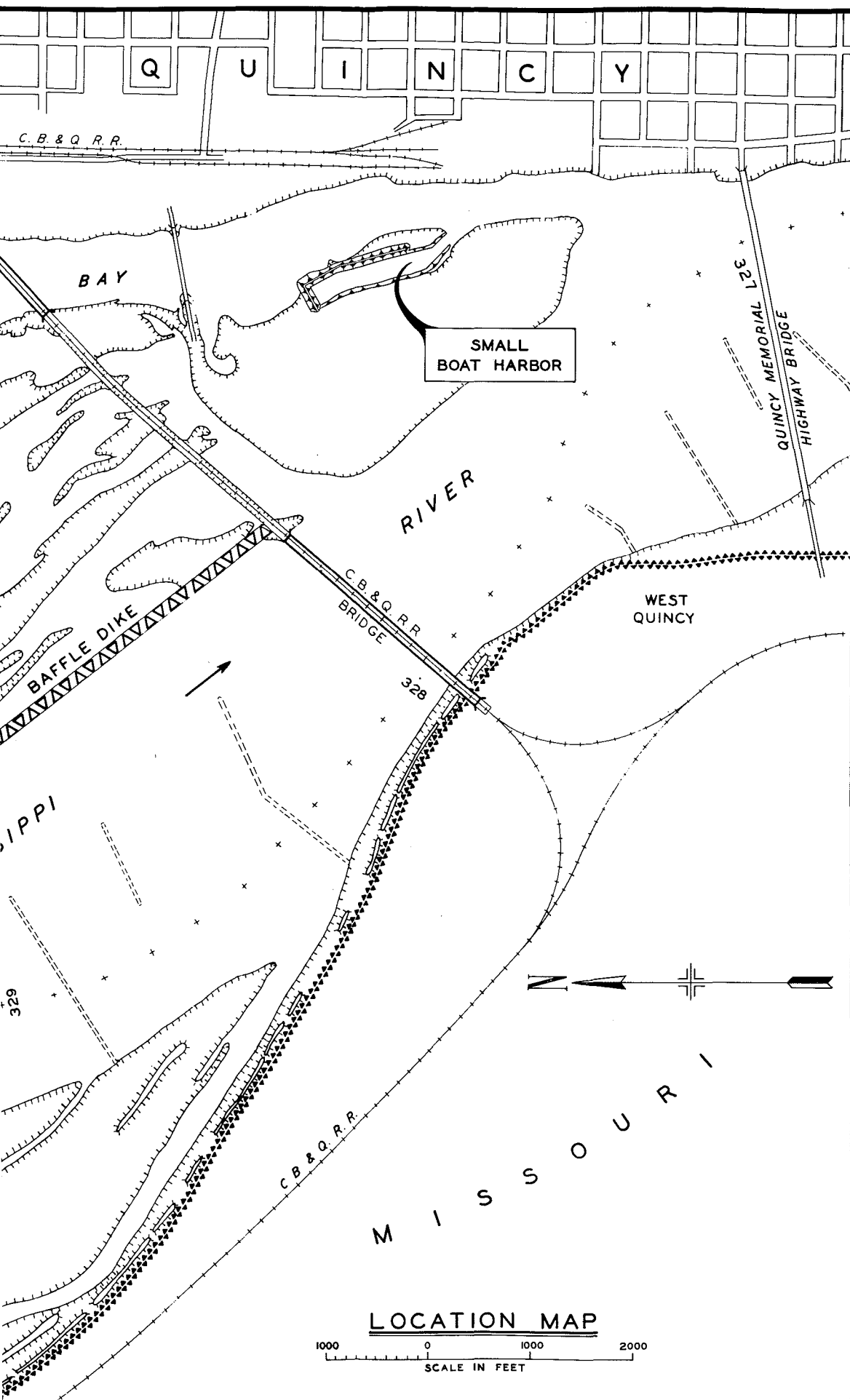


LEGEND

DREDGING

MILEAGE ORIGINATES AT MOUTH
OF OHIO RIVER

ELEVATIONS BASED ON MEAN SEA
LEVEL DATUM (1912 ADJUSTMENT)



LEGEND

DREDGING

MILEAGE ORIGINATES AT MOUTH OF OHIO RIVER

ELEVATIONS BASED ON MEAN SEA LEVEL DATUM (1912 ADJUSTMENT)

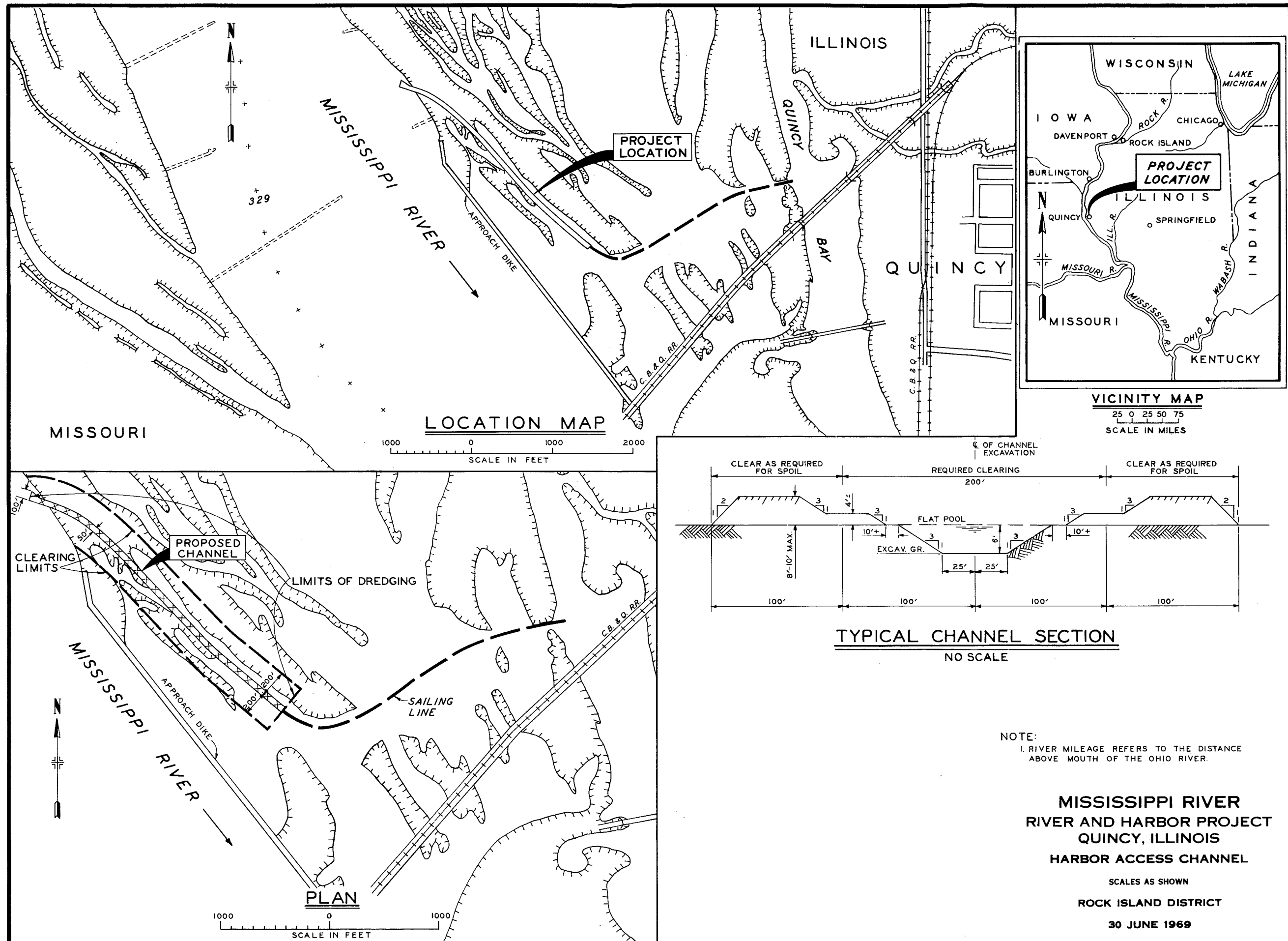
**MISSISSIPPI RIVER
RIVER AND HARBOR PROJECT
SQUAW CHUTE - QUINCY, ILLINOIS**

SMALL BOAT HARBOR

SCALES AS SHOWN

ROCK ISLAND DISTRICT

30 JUNE 1965



SECTION VII

OPERATION AND MAINTENANCE

1. Manager-Ranger. The need for and suggested duties of a pool manager-ranger are detailed and outlined in Chapter I, Section IX, paragraph 2. Federal lands are extensive throughout the pool reach and one of the largest wildlife sanctuaries in the Rock Island District has been established on an island complex. Supervision of existing recreational facilities, examination of recreational potential, levee inspection, protection and supervision of the timber resource, and general administration of Federal lands are but some of the reasons for the creation of this specialized position.

2. Recreation facilities maintenance. Under the existing provisions of Public Law 89-72, no new public recreation areas may be located by the Corps of Engineers at Federal expense exclusively. However, installations presently established and operative may be improved, expanded, and maintained as public demand requires and to the extent possible with funds requested and allocated.

Responsibility for improvement of existing facilities, new construction, and general maintenance is assigned to the Operations Division of the Rock Island District Office. The Operations Division supports a field crew of 6 employees to perform the required maintenance and construction work on the 25 Mississippi River public recreational areas existing within the Rock Island District. Activities continue throughout the year with additional and temporary personnel engaged when required. The supervisor of the group also acts as a contracting officer with private individuals who accept seasonal appointments by bid for trash and garbage removal, grass cuttings, etc.

SECTION VIII

SUMMARY AND RECOMMENDATIONS

1. General summary. Federal lands are extensive in most areas of the pool and a considerable recreational potential exists. However, the levee system precludes ready access to pool waters, except within the limits of population centers, and only a few roads provide access in the rural areas to levees. Non-Federal shorelands are probably not especially attractive to private industry at the present time, except in the Quincy, Illinois, area where rail and highway transportation is available in addition to water. Such shore areas, however, should be protected and preserved for scenic and ecological values to serve an expanding population with increasing means, mobility, and leisure. County zoning will be necessary to insure such areas for the benefit of future generations.

2. Recommendations.

a. Consideration is recommended towards the establishment of a pool Manager-Ranger position as outlined and explained in Chapter I, Section IX, paragraph 2. The advantages would be a reduction in time and effort of District Office personnel, improved liaison with other Federal and non-Federal agencies, a reduction in unauthorized use of Federal lands and vandalism and better public relations, especially in developed recreation areas.

b. The island complex lying within the river miles 340.5 - 342.0 area and existing presently as partially Federal fee land should be considered for future acquisition. Two small tracts, which once stood as separate Federally-owned islands, have been joined to the main body of the larger island in the group by accretion. The addition of this property to Federal control will protect and preserve the forestry resource and wildlife habitat and enlarge public recreational opportunities.

c. Approval is recommended for the land use zoning as established for Federal lands within the pool and indicated on the transparent overlays accompanying the base charts of the master plan. Private use areas, by order of the Chief of Engineers, shall cease to exist after 30 November 1988. Such presently existing sites will then be reclassified as to priority and use. The concept of a Master Plan, however, allows for flexibility and is subject to continual review and revision. Any or all of the private use sites, therefore,

might be reclassified prior to the date indicated should a higher priority of use become apparent. All other categories of priority and use are likewise subject to change in classification as demand and circumstances may direct.

d. Timber management objectives, as indicated on transparent overlays accompanying the base master plan charts, are designed for sound silvicultural practices and are recommended for approval. However, the District timber management program - as previously noted - is presently being restudied. Objectives, as shown, may be subject to future revision and modification.

American elm stands in the timber resource of the pool have been seriously decimated by the continuing infestation of Dutch elm disease, common throughout the midwest region for a number of years. Removal of affected trees has not been considered since costs would be prohibitive.

3. Suggested future recreation facilities.

a. An excellent area for float-marked canoe trails exists in the slough stretch of Canton Chute, river mile 332 to 342, and possibly to the loop inland on Bear Creek and to Indian Grave Lake inland by way of Corner Slough. Another excellent area for this type of recreational activity is present in the slough complex in and above Quincy Bay, river miles 328 to 331.

b. The pecan grove area, downstream of the Bear Creek Public Use Area and containing Indian Grave Lake, offers excellent opportunities for nature and hiking trails with access from the public use site road. Vegetative specimens might be identified as an educational feature.

c. Another extensive area, with similar opportunities, lies both upstream and downstream of the Canton Chute Public Use Area. Access would be from the public use site and would presently be limited because of the private use cottage sites which prevent expansion of recreational facilities.

d. Vantage points for artists, sightseers, and photographers might be located at points affording an especially scenic view of the river and its shores and islands - particularly areas offering outstanding displays of the spectacular autumn coloring for which the Upper Mississippi River valley is noted. Locales would need to be chosen by careful visual and seasonal survey.

e. The Bear Creek Public Use Area is quite isolated and telephone service should be considered - especially for

emergency needs. Information relative to medical assistance, the nearest hospital, and other pertinent data should be readily available. Lighting would be required with any such installation.

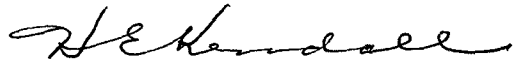
f. A sealed bulletin-board type of display might be erected at the Bear Creek Public Use Area featuring hunting and fishing regulations, camping rules, vandalism warning, littering appeal, etc. Identified specimens of the flora and fauna of the area could be included as well as a general map of the region - especially if nature and hiking trails are developed in adjacent lands.

g. There is no public access to the Missouri pool shore except at LaGrange and Canton, Missouri. However, there is access across approximately 700 feet of privately owned land and over the Fabius River flood protection levee to Government property at river mile 330. The road is graveled and is used by the local farmer who farms the agricultural land located on Cottonwood Island, as well as other local people (General Plan and Cooperative Agreement lands.) The road on Government land leads to a dirt fill plug in the chute which permits access by automobile to Cottonwood Island. Cottonwood Island is a fairly high island and has possibilities if developed for a day use and/or camping area. Future acquisition of this right-of-way by the Government would open approximately 80 acres of shoreland and 275 acres of Cottonwood Island for public use.

SECTION IX
REVIEW OF PLAN

1. Real Estate Division.

Pursuant to paragraph 5b of ER 405-2-835, the Master Plan was submitted for review and the Real Estate Division concurs that the material was prepared in accordance with sound real estate management and utilization practices.



H. E. KENDALL
Chief, Real Estate Division

2. Operations Division.

Sections of this Master Plan, which have a direct or indirect bearing upon the operation and maintenance of the Mississippi River, have been coordinated with the Operations Division.



ROBERT E. CLEVENSTINE
Chief, Operations Division