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19. ABSTRACT (Continue on reverse if necessary and identify by block number) This plan implements the Corps program to prepare emergency plans for all Corps dams. It provides a guide for actions to identify and mitigate or respond to various types of emergencies which, while rare, could occur in the operation of Lock and Dam No.6. <i>top. i</i>					
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EMERGENCY PLAN  
FOR  
LOCK AND DAM NO. 6 TREMPLEAU, WISCONSIN

Prepared by the  
U.S. ARMY CORPS OF ENGINEERS  
SAINT PAUL DISTRICT

July 1986

DTIC  
ELECTE  
MAR 27 1989

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TO See Attached Distribution	FROM NCSSED-M	DATE 18 May 1987 Mr. Blackstone/5949	CMT 1
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A copy of the completed emergency plan for lock and dam 6 is enclosed for your reference. This report implements the Corps program to prepare emergency plans for all Corps dams. It provides a guide for identifying, mitigating, or responding to various types of emergencies which, although unlikely, could occur during the operation of the dam.

1 Encl

  
JOHN F. BLACKSTONE  
Project Manager

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Dated  
15 May 1987



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**

ST. PAUL DISTRICT, CORPS OF ENGINEERS  
1136 U.S. POST OFFICE & CUSTOM HOUSE  
ST. PAUL, MINNESOTA 55101-1479

August 28, 1986

*John Verto  
A. St. Paul  
Dist. for Minn. etc  
pu*

**NCS-ED-M**

**SUBJECT: Emergency Plans for Lock and Dam 6**

**Commander, North Central Division  
536 South Clark Street  
Chicago, Illinois 60604-1592**

1. Subject report is submitted in accordance with Engineer Regulation 1130-2-419.
2. This report implements the Corps program to prepare emergency plans for all Corps dams. It provides a guide for identifying, mitigating, or responding to various types of emergencies, which, although unlikely, could occur during the operation of lock and dam 6.

1 Encl  
(4 cys)

*Joseph Briggs LTC, CE, DC*  
**JOSEPH BRIGGS**  
 Colonel, Corps of Engineers  
 Commanding

NCDED-W (NCSED-M/28 Aug 86) 1st End  
SUBJECT: Emergency Plans for Lock and Dam 6

Mr. Vento/lj/353-6348

DA, North Central Division, Corps of Engineers, 536 South Clark Street,  
Chicago, Illinois 60605-1592

TO: Commander, St. Paul District, ATTN: NCSED-M

1. The subject emergency plan has been reviewed. Revised pages should be prepared to address the following comments:

a. Paragraph 6e, page 9. Lock and Dam 6 is under the supervision of the Construction-Operation Division of the St. Paul District. The plan indicates that the project is under the Construction Division of the St. Paul District.

b. Paragraphs c(2) and c(3), page B-9. The outline of emergency action to be taken has two references to the Project Operations Branch. One of these references should be eliminated.

c. Page C-6, Sheet 2 of 3. The notification list needs to be updated. Specific reference is made to the elimination of Mr. Jack Thompson's name from the list of contacts at OCE (Mr. Thompson is deceased). In addition, Mr. Earl Eiker has been appointed to be the chief of the H&H Division at OCE.

2. Please feel free to contact Mr. John Vento at FTS 353-6348 for additional information on these comments.

FOR THE COMMANDER:

Encl w/d

  
ZANE M. GOODWIN, P.E.  
Chief, Engineering Division

NCS&D-M (NCS&D-M/28 Aug 86) 2d End

Mr Blackstone/ap/5949

SUBJECT: Emergency Plans for Lock and Dam 6

Commander, St. Paul District, 1135 USPO & Custom House, St. Paul, Minnesota  
55101-1479 12 NOV 1986

TO: Commander, North Central Division, ATTN: NCS&D-W, 536 South Clark Street,  
Chicago, Illinois 60605-1592

Our responses to comments in 1st endorsement are as follows:

a. The title for Construction-Operations Division has been inadvertently shortened to Construction Division. However, paragraph 6e does communicate the correct information about the operation and maintenance of lock and dam 6 and the name Construction Division is not misleading. Therefore, this phase will not be revised in this emergency action plan but will be corrected in any future plans.

b. The title of paragraph c(2) on page B-9 should be "Emergency Operations Center." A copy of the corrected page is enclosed.

c. A copy of the updated notification list is enclosed.

FOR THE COMMANDER:



PETER A. FISCHER  
Chief, Engineering Division

2 Encls  
wd encl 1  
added 1 encl  
2. page B-9

NCDED-W (NCSED-M/12 Nov 86) 3rd End  
SUBJECT: Emergency Plans for Lock and Dam 6

Mr. Vento/lj/353-6348

DA, North Central Division, Corps of Engineers, 536 South Clark Street,  
Chicago, Illinois 60605-1592

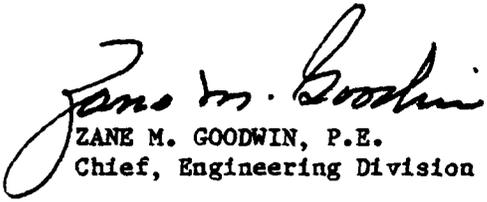
NOV 20 1986

TO: Commander, St. Paul District, ATTN: NCSED-M

The revised emergency plan for the Lock and Dam 6 adequately addresses the previous NCD comments. The manual is approved.

FOR THE COMMANDER:

wd all encl

  
ZANE M. GOODWIN, P.E.  
Chief, Engineering Division

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## GLOSSARY

EMERGENCY PLAN  
FOR  
LOCK AND DAM NO. 6 TREMPPEALEAU, WISCONSIN

1. Introduction

Part of the land surrounding Lock and Dam No. 6 that could be inundated by flooding is not in Federal ownership. In addition, most of the land under Federal control is also public use land. The possibility, therefore, exists that high water levels could cause a hazard to life and property in the project area and surrounding lands. In addition, a failure of the dam or embankment during normal pool, low flow conditions could result in the sudden release of a large volume of water from Pool No. 6 which would cause a hazard to life and property in the project area and surrounding lands.

a. Purpose

This plan implements the Corps program to prepare emergency plans for all Corps dams. It provides a guide for actions to identify and mitigate or respond to various types of emergencies which, while rare, could occur in the operation of Lock and Dam No. 6. Specific information on emergency actions to be taken is provided in the following appendices:

- (1) Appendix A, Emergency Identification Subplan.
- (2) Appendix B, Emergency Notification Subplan.
- (3) Appendix C, Flood Profiles and Operating Curves.

b. Applicability

The emergency plan is applicable to all Corps elements and field offices concerned with operation of Lock and Dam No. 6.

c. References

- (1) ER 1130-2-419, "Dam Operations Management Policy", U.S. Army Corps of Engineers, 18 May 1979.
- (2) Director of Civil Works multiple letter dated 20 March 1978, subject: Evacuation Plans for Areas Downstream of Corps Dams and Corps/State Cooperation on Safety Review of Corps Dams.
- (3) Water Resource Development: Minnesota (U.S. Army Corps of Engineers, North Central Division, January 1979).
- (4) Flood Emergency Plan for Lock and Dam 2.

Hydrology and Hydraulics Appendix A (U.S. Army Corps of Engineers, St. Paul District, 1983).

- (5) Flood Emergency Plan for Lock and Dam 10, Hydrology and Hydraulics Appendix A (U.S. Army Corps of Engineers, St. Paul District, 1983).
- (6) Flood Hydrograph Package, HEC-1 (U.S. Army Corps of Engineers, Hydrologic Engineering Center, Davis, California, September 1981).
- (7) Probable Maximum Precipitation Estimates and Snowmelt Criteria for the Upper Mississippi River Basin in Minnesota at the Fox-Wolf Rivers in Wisconsin, (National Weather Service, 1981).
- (8) Runoff from Snowmelt, EM 1110-2-1406, (U.S. Army Corps of Engineers, 5 Jan 1960).
- (9) Seasonal Variation of 10-Square Mile Probable Maximum Precipitation Estimates, United States East of the 105th Meridian, HMR-53, (U.S. Department of Commerce, Silver Spring, MD, April 1980).
- (10) Probable Maximum Precipitation Estimates, United States East of the 105th Meridian, HMR-51, (U.S. Department of Commerce, Washington, DC, June 1978).
- (11) Application of Probable Maximum Precipitation Estimates - United States East of the 105th Meridian, HMR-52, (U.S. Department of Commerce, Washington, DC, August 1982).
- (12) Computer Program, Probable Maximum Storm HMR-52 (U.S. Army Corps of Engineers, Hydrologic Engineering Center, Davis, California, November 1982).
- (13) Standard Project Flood Determinations, EM 1110-2-1411 (U.S. Army Corps of Engineers, Washington, DC, March 1965).
- (14) Master Regulation Manual for Mississippi River Nine Foot Channel Navigation Projects. (U.S. Army Corps of Engineers, St. Paul District, September 1969).
- (15) Mississippi River, Nine Foot Channel Navigation Project, Reservoir Regulation Manual, Appendix 5, Lock and Dam No. 6, Trempealeau, Wisconsin. (U.S. Army Corps of Engineers, St. Paul District,

November 1970).

- (16) Upper Mississippi River, Water Surface Profiles, River Mile 0.0 to River Mile 847.5. (Upper Mississippi River Basin Commission and U.S. Army Corps of Engineers, Rock Island District).
- (17) Reconnaissance Report - Major Rehabilitation, Lock and Dam Numbers 5A, 6, 7, 8 and 9, Mississippi River, Minnesota and Wisconsin. (U.S. Army Corps of Engineers, St. Paul District, March, 1985).
- (18) Hydrology and Hydraulics for the Flood Emergency Plan for Lock and Dam 10, Upper Mississippi River, Guttenberg, Iowa. (U.S. Army Corps of Engineers, St. Paul District, November 1983).
- (19) Research Document No. 19. Example Emergency Plan for Blue Marsh Dam and Lake. (U.S. Army Corps of Engineers, St. Paul District, August 1983).
- (20) Lock and Dam No. 6. Mississippi River, Wisconsin; Lock, Dam, and Earth Dike Periodic Inspection Report No. 3. (U.S. Corps of Engineers, St. Paul District, September 1983) includes Project Brochure.
- (21) Earth Manual, Second Edition. (U.S. Department of the Interior, Water and Power Resources Service Reprint - 1980.)
- (22) FM 5-35 Engineer's Reference and Logistical Data, Department of the Army, 1971.
- (23) ER 550 1-1, Emergency Employment of Army and other resources, National Disaster Procedure, dated 9 January 1978).

d. Scope

This plan addresses emergencies related to above normal reservoir water levels and/or rapid release of large volumes of water past the dam. It covers identification of impending or existing emergencies, and notification of other parties concerning impending or existing emergencies.

e. Datum

All elevation readings contained in this report have the designation National Geodetic Vertical Datum (NGVD) 1912.

## 2. Description of Project Area

### a. Location

Lock and Dam 6 is located on the Mississippi River 714.4 river miles above the mouth of the Ohio River, 14.1 river miles downstream from Lock and Dam 5A, and 11.9 river miles upstream above Lock and Dam 7. The main lock and the upper gate bay of an auxiliary lock are on the left bank of the river adjacent to the village of Trempealeau, Wisconsin. A plan view and various cross-section views of Lock and Dam 6 are shown on Plates 2 and 3.

### b. Topography

The project area is located in the Upper Mississippi River Basin. The river flows through a valley excavated by a much larger, early glacial stream and follows a winding course between low banks in a wide flood plain bordered by high bluffs of sedimentary rock. Lock and Dam No. 6 creates Pool 6, having an area of about 8,870 acres at project pool elevation 651.0 feet. The drainage area of the pool is 60,030 square miles.

### c. Geology

All of the Upper Mississippi River Basin in the St. Paul District is underlain by a series of precambrian igneous and metamorphic rocks, formed several billion years ago. In southeastern Minnesota and southwestern Wisconsin, a huge trough in the old precambrian rocks is filled with several thousand feet of precambrian conglomerates, sandstone, shales and a thick series of younger limestones, shales and dolomites of Paleozoic Age.

### d. Climate

The climate in the Upper Mississippi River basin varies from dry subhumid in the west to humid near Lake Superior, with the Twin Cities of Minneapolis and St. Paul, Minnesota, in the larger, moist subhumid central region. The average temperature varies from about 45 degrees F to less than 40 degrees F from south to north, while the normal total precipitation varies from less than 20 inches per year in the prairie to more than 36 inches per year in the northeast.

### e. Description of Upper Mississippi River Basin

In the St. Paul District, the Mississippi River and its tributaries drain an area of almost 80,000 square miles, of which 45,000 square miles are in Minnesota, 32,000 square miles are in Wisconsin and the remainder are in South Dakota and Iowa. In this district, the Mississippi River drops almost 60% of its total fall. In the northwestern portion of the state of

Minnesota, channels of streams have flat gradients and meander through shallow valleys. In north central Minnesota with its heavy frost cover, flat land slopes and large storage capacity in lakes, swamps and reservoirs, there is not serious flood problems. However, in the southeastern part of the State, the tributaries, flowing from the prairies to the main stream, have cut deep gorges through the soft limestones and sandstones which form the bedrock in this area. The relatively high rainfall, combined with the steep gradient of the channels, cause these streams to have occasional flash floods. Drainage areas at selected points along the Mississippi River are presented in Table 1.

Table 1 - Mississippi River Drainage Areas

Station	Drainage Area (sq. mi.)	River Mile
Mississippi River at St. Paul :	36800	: 840.0
Mississippi River at L&D 2 :	36990	: 815.2
Mississippi River at L&D 3 :	45170	: 796.9
Mississippi River at L&D 4 :	57100	: 752.8
Mississippi River at L&D 5 :	58845	: 738.1
Mississippi River at L&D 5A :	59105	: 728.5
Mississippi River at L&D 6 :	60030	: 714.3
Mississippi River at L&D 7 :	62340	: 702.4
Mississippi River at L&D 8 :	64770	: 679.2
Mississippi River at L&D 9 :	66610	: 647.9
Mississippi River at L&D 10 :	79370	: 615.1

### 3. Description of Project Features

#### a. Lock

Lock 6 is on the east side of the Mississippi River adjacent to the village of Trempealeau, Wisconsin. This reach of the river is about 4,000 feet wide with the bed of the river at about elevation 624 feet. The main lock has a usable length of 600 feet and a width of 110 feet, which is standard for the Ohio and Upper Mississippi Rivers. The partially constructed auxiliary lock is designed to have a usable length of 360 feet and a width of 110 feet.

#### b. Dam 6

Dam 6 consists of three distinct types of construction: movable gate section with 5 roller gates, 10 tainter gates with appurtenant piers, sills and aprons; a 3,050 foot earth fill embankment with rip rapped slopes; and a 1,000 foot concrete fixed crest spillway (near Minnesota end). A service bridge spans the entire length of the movable dam and storage yard. Table 2 contains a summary of pertinent data.

Table 2 - Pertinent Data

---

POOL	
Length	: 14.2 miles
Upper Pool Elevation	: 645.5 feet
Lower Pool Elevation	: 639.0 feet
Differential Head	: 6.5 feet
Minimum Discharge	: 2,250 cfs (29 Dec 33)
Maximum Discharge	: 268,000 cfs (19 Apr 65)
Average Daily Flow	: 26,500 cfs
Years of Record	: 54 years

Table 2 - Pertinent Data (Cont'd)

GATED PORTION OF DAM			
		Tainter	Roller
Number of Gates	:	10	5
Sill Elevation	:	630.5 feet	625.5 feet
Stilling Basin Elevation	:	627.0 feet	620.5 feet
Concrete Apron Length	:	62.6 feet	40.0 feet
Operating Head	:	6.5 feet	6.5 feet
Cutoff	:	Steel Sheet Piling	

EMBANKMENT			
Type	:	Earth Dike	
Length	:	3,700 feet	
Width	:	32.75 feet	
Top Elevation	:	654.5 feet	
Side Slopes	:	(1 on 3 upstream)	
	:	(1 on 5.5 downstream)	
Slope Protection	:	12 inches riprap plus 6	
	:	inches filter on downstream	
	:	side.	
Cutoff	:	Steel sheet piling for a	
	:	distance of approximately	
	:	25 feet from abutment.	

Table 2 - Pertinent Data (Cont'd)

---

MAIN LOCK		
Length	:	600 feet
Width	:	110 feet
Depth on Upper Gate Sill	:	17 feet
Depth on Lower Gate Sill	:	12.5 feet
Upper Gate Sill Elevation	:	628.5 feet
Lower Gate Sill Elevation	:	626.5 feet
Top Lock Wall Elevation	:	654.5 feet
Lock Floor Elevation	:	624.0 feet

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AUXILIARY LOCK		
Length	:	Not Completed
Width	:	110 feet
Depth on Upper Gate Sill	:	19 feet
Depth on Lower Gate Sill	:	Not Completed
Upper Gate Sill Elevation	:	626.5 feet
Lower Gate Sill Elevation	:	Not Completed
Top Lock Wall Elevation	:	654.5 feet
Lock Floor Elevation	:	624.0 feet

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c. Public Use Areas

In addition to the commercial navigational uses of Pool 6, the pool is used heavily by the general public for recreation. Including facilities at Perrot State Park, a total of 11 public access sites have been provided by Federal and non-Federal agencies and other interests for water-associated activities.

The Corps of Engineers has not participated in development of any access facilities in pool 6 but has provided land for one site, Trout Creek Landing, operated and maintained by the Bureau of Sport Fisheries and Wildlife. The Corps has constructed one small-boat harbor on Latsch Island at Winona on city-owned land. The harbor is being operated and maintained by the City. In addition to developing one site on Corps' land, the Bureau of Sport Fisheries and Wildlife has developed the Trempealeau River Landing on Bureau lands about 3 miles up the Trempealeau River in the Trempealeau National Wildlife Refuge.

Within its corporate limits, the city of Winona has constructed and is operating and maintaining four launching areas and two small-boat harbors on municipal lands. The City also operates and maintains the small-boat harbor constructed by the Corps of Engineers on Latsch Island. The village of Homer has constructed and is operating one access site on village-owned lands.

#### d. Gages and Instrumentation

Lock and Dam No. 6 has Stevens Type A35 Water Level Recorders installed to provide a continuous record of pool and tailwater stages. In addition to the recorders, staff gages are installed at both pool and tailwater gage wells. All gage settings are tabulated, discharges computed, and changes in gage settings are recorded, as are temperatures, precipitation, and ice and snow conditions.

A Fisher-Porter automatic weighting, punched tape, binary decimal recording gage, Model 1584 is installed at Lock and Dam No. 6. A standard U.S. Weather Bureau nonrecording rain gage is also available at this site.

#### e. Operations and Maintenance

Lock and Dam No. 6 is operated by the St. Paul District Corps of Engineer's Construction Division, under the Lock and Dam Section of the Project Operations Branch. The basic organization for operating the Lock and Dam includes the following personnel: 1-Area Lockmaster, 1-Lockmaster, 1-Lock & Dam Equipment Repairman (Electrician), 4-Head Lock & Dam Operators, 5-Lock & Dam Operators. This work force is maintained throughout the year.

The primary purpose of the dams in the St. Paul District is to maintain a minimum channel depth of 9 feet for navigation. To do this, project pool elevations must be maintained at the primary control points. Operation of the dams is required at low and moderate flows in the Mississippi River. But during high flows, the movable gates are removed from the water before flood stages are reached.

The primary control point for Pool No. 6 is at Winona, Minnesota, where project pool, elevation 645.5 feet, is maintained by the operating of Dam No. 6 until the discharge at the dam exceeds 26,000 cfs. At this discharge, the maximum drawdown of the pool at the dam, 1.0 foot to elevation 644.50 feet, is reached, and control of the pool is shifted to secondary control at the dam.

As the discharge increases above 26,000 cfs, the pool level at the dam is held at elevation 644.50 feet, and the stage at all other points in the pool is allowed to rise. Also, as the discharge increases, the operating head at the dam decreases. When the discharge reaches 71,000 cfs, the head at the dam will be less than 1.0 foot, and all the gates are then raised clear of the water and the dam is out of control. On the recession, the gates are returned to the water when the pool at the dam drops to elevation 644.50 feet, secondary control elevation. This elevation will be reached at a flow of 71,000 cfs, and secondary control elevation is maintained at the dam until the water level at the primary control point drops to project pool elevation 645.50 feet at a flow of 26,000 cfs. Operating curves for Lock and Dam 6 are shown on Plate C4 in Appendix C.

The lock miter gates are never used for regulating the discharge. When the pool level exceeds elevation 648.2, the gate operating motors must be removed, and the upper miter gates are kept in the closed position while the lock is out of operation.

#### 4. Potentially Affected Project Areas

For the purpose of this report, "Potentially Affected Project Areas" would include all lands under the control of the Corps of Engineers and potentially affected by emergencies at Lock and Dam No. 6. This would include the Public Use Areas discussed in Section 3d of this report. In addition to Lock and Dam No. 6, all lock and dams downstream would be temporarily affected by the increased flows they would have to handle. Lock and Dams 7, 8 and 9 would be affected most (see Reference 18). Also the 9-foot channel in Pool 6 would be lost.

#### 5. Potentially Affected Non-project Areas

For the purpose of this report, "Potentially Affected Non-project Areas" would include all areas not presently under the control of the Corps of Engineers and potentially affected by emergencies at Lock and Dam No. 6. This would include all the communities listed in Section 10 of this report. If Lock & Dam 6 were lost, all commercial and recreational vessels wishing to proceed upstream of Pool 7, downstream from Pool 5A and all vessels located in Pool 6, would be affected by the probable loss of the nine foot channel in Pool 6 (see Reference 18).

## 6. Potential Causes of an Emergency

The potential causes of an emergency affecting the operation or safety of Lock and Dam No. 6 include:

### a. Excess Seepage

A potential exists for seepage through, around or under the dam, lock, and/or earth dike especially during the high head, low tailwater condition which exists during periods of low flow. Some seepage is normal and not considered hazardous. However, seepage that increases in amount or contains suspended solids may indicate piping which can lead to a breach of the dam or earth dikes (discussed in 6d).

### b. Sabotage

A potential exists that operation of the Lock and Dam could be affected by sabotage disrupting communications, disabling gate controls or equipment, breaching the dam or various combinations of the foregoing. Only breaching of the lock and/or dam or earth dike, for instance by use of explosives, could cause sudden release of a dangerous volume of water.

### c. Extreme Storm

An extreme storm could occur in the area of the reservoir or over the watershed upstream of the reservoir. An extreme storm could result in large inflows to the reservoir causing a high reservoir level, large discharges over the spillway and/or high waves on the reservoir surface.

### d. Failure of Earth Dikes

The greatest threat is posed by the earth dikes inability to withstand overtopping. Because the embankment is a sandfill type and may not be adequately protected with armor stone, the potential exists for a large breach to be washed out. Since the difference between headwater and tailwater elevations is less than a foot when the dam is out of control, failure of the dike is not likely to be catastrophic and there would be little threat to life. The primary result of this type of failure would be the loss of the 9-foot channel.

A normal pool-low tailwater earth dike failure could happen as a result of a sliding or sloughing of the dike face. A slope failure that extended to the top of the embankment would effectively lower the crest. This could result in the sudden release of a large volume of water if the pool water surface exceeded the elevation of the resulting dike crest and result in overtopping of the dike. The potential or control of slope failure problems depends on their magnitude, severity, pool water surface elevation and other circumstances.

e. Failure Due to Scouring

The scour holes downstream of the tainter gate stilling basins (Reference 17) were repaired in 1983. If the scour holes would have been, or in the future are allowed to move toward the structures, the stilling basins could eventually be under-mined and the piling in their foundations would be exposed. As the piles deteriorated, differential settlement would occur, the structure's hydraulic characteristics would change and the ability to control the water in Pool 6 with the tainter gates would be lost. This in turn would result in a loss of the nine foot channel in Pool 6 as well as a possible breaching of the structure and release of large volumes of water from Pool 6.

7. Standard Project Flood

The standard project flood (SPF) at Lock and Dam 6 is 365,000 cfs. It is derived from an SPF versus drainage area curve, Reference 18. A downstream area map and flood profiles for Lock & Dam 6 are shown on Plates C1 thru C3 in Appendix C.

8. Existing Spillway Capacity

The existing spillway at Lock and Dam 6 was designed for a discharge of 180,500 cfs and a maximum pool elevation of 651.8 feet. The 1965 flood (273,000 cfs) exceeded this design and resulted in overtopping of the earth dike by 0.15 feet. Discharge through the existing gated structure and appurtenances with the pool elevation at the top of the dam would be 264,000 cfs and has an exceedence frequency of 0.62 percent (Reference 17).

9. Affected Areas

The computed maximum discharge through the existing gated structure at SPF pool and tailwater conditions is 264,000 cfs. The peak discharge for the SPF is 365,000 cfs, which leaves a spillway inadequacy of 101,000 cfs and the potential for overtopping the dike by 3.1 feet.

The failure of Lock and Dam No. 6's earthen dike has negligible effect on the SPF peak outflow due to the dam's low head differential and negligible influence in restricting high flows according to the conclusion reached in Reference 5. Consequently, flooding downstream is not aggravated by failure of the dam during the Standard Project Flood.

The gated portion of the dam or an earth dike failure at normal pool elevation 645.5 feet would probably result in an insignificant increase in water surface elevations downstream of the dam. Failure of the gated portion or earth dike under normal pool conditions does not present a significant flood inundation hazard to downstream individuals and properties. However, the

increased flow velocities and/or waves caused by the sudden release of a large volume of water presents the greatest hazard to life and property for surface activities, in the vicinity of the lock and dam, at the time of failure.

Also Lock and Dam No. 7 would temporarily become more difficult to control. Since the loss of Lock and Dam No. 6 would result in the loss of the navigation channel in Pool 6, all surface vessels operating in Pool 6 would be in some danger and those tows upstream of Pool 6 would have to wait until repairs were made before they could proceed downstream.

#### 10. Identification of Needed Evacuation Planning

##### a. Jurisdictions Affected

The project area affected encompasses parts of or all of the following jurisdictions in Winona County located in Minnesota and Trempealeau County located in Wisconsin.

1. Trempealeau, Wisconsin
2. Dakota, Minnesota
3. Dresbach, Minnesota
4. Midway, Wisconsin
5. La Crosse, Wisconsin
6. Onalaska, Wisconsin

##### b. Evacuation Plans

Plans pertinent to the dissemination of flood warnings and evacuation in the portions of the jurisdictions which would be affected in the case of a flood with or without failure or failure at normal pool, should incorporate the information presented in this report into all existing and future plans. A copy of this report is to be provided to the appropriate emergency personnel for each of the affected communities.

##### c. Evaluation of Evacuation Plans

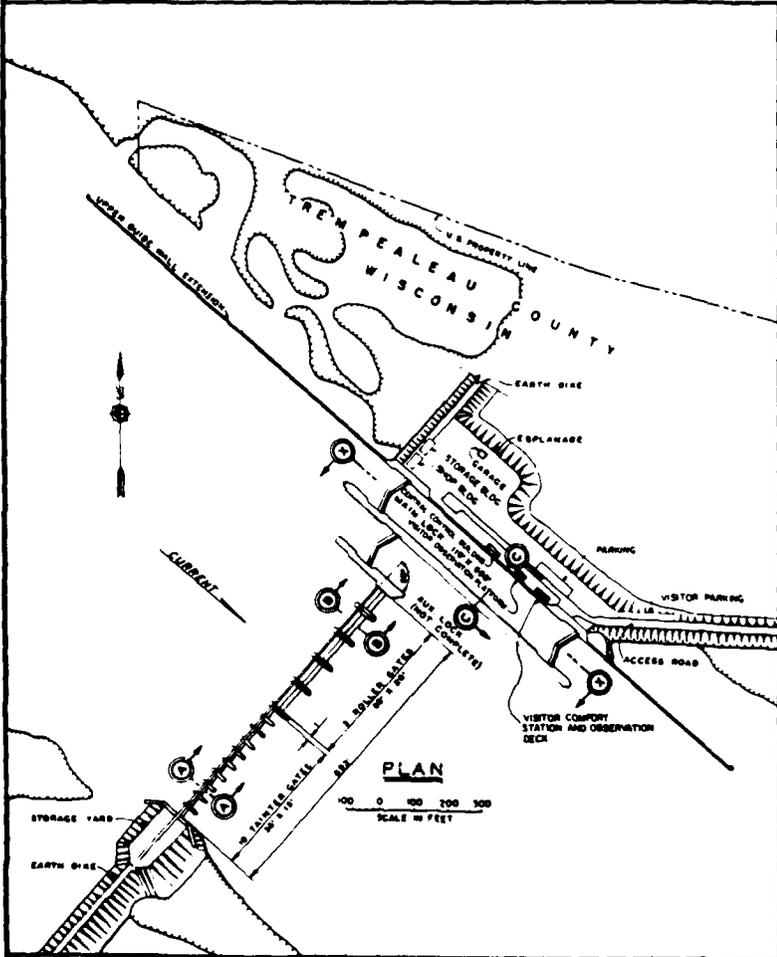
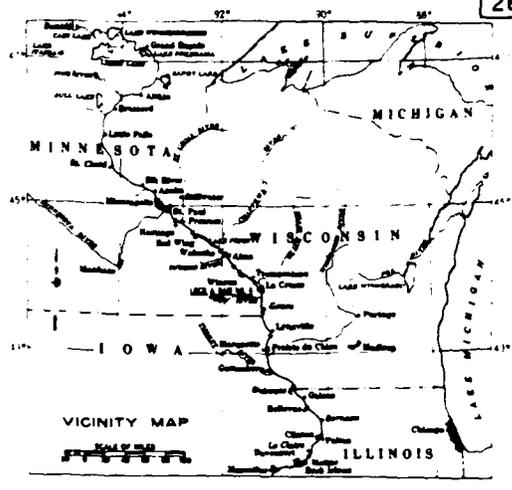
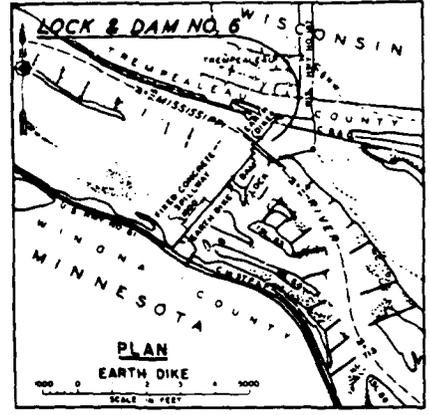
Principal characteristics of evacuation plans which affect their potential for successful execution are shown in Table 3.

##### d. Evacuation Planning

Evacuation plans are to be developed through local coordination with the affected communities. Information on evacuation planning and examples of evacuation plans are available from the Corps of Engineers.

TABLE 3  
CHARACTERISTICS OF EVACUATION PLANS

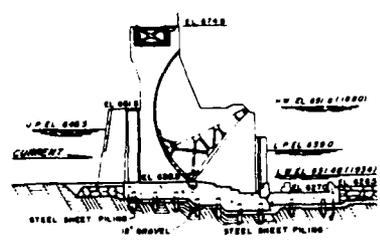
Plan Characteristics	Plan 1	Plan 2
Is plan written?		
Is plan current?		
Does plan have formal legal status through appropriate adoption or recognition by non-federal authorities?		
Does plan specify actions to be taken in sufficient detail to avoid indecision on whether or not to execute the plan and how it should be executed?		
Does plan make specific assignments of responsibility for its initiation and execution?		
Does plan cover all parts of the jurisdiction requiring evacuation?		
Is successful execution of plan in potential emergency situations reasonable in view of the warning time likely to be available for an emergency?		
Is plan consistent with various causes of emergencies likely to exist at time evacuation is required?		
Does plan evidence realistic analysis of means of warning and transporting evacuees, lane capacities of escape routes and other pertinent matters?		
Are equipment, personnel and materials required for execution of the plan identified?		
Does plan contain adequate provisions for updating, testing, practice and other maintenance activities to assure its continued viability?		



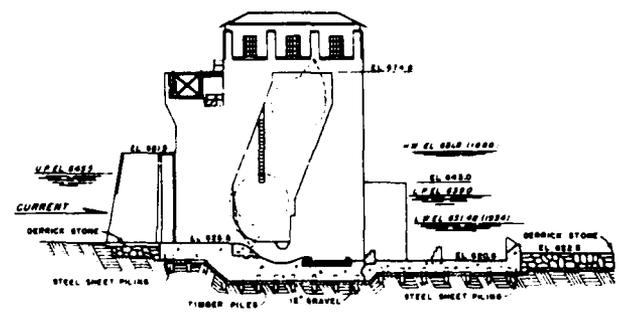
TOTAL LENGTH OF EARTH DIKE 3050 FT  
 DEPTH ON UPPER GATE SILL 10 FT U.P.E.L. 6455'  
 DEPTH ON LOWER GATE SILL 15 FT U.P.E.L. 6390'  
 ELEVATION UPPER GATE SILL 628.5  
 ELEVATION LOWER GATE SILL 626.5

ELEVATIONS ARE REFERRED TO M.S.L. 92 ADJ.

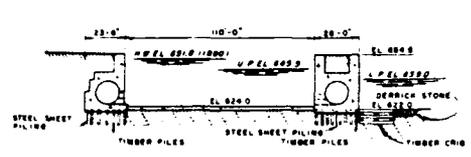
RIVER & HARBOR PROJECT  
 MISSISSIPPI RIVER  
 MISSOURI RIVER TO MINNEAPOLIS, MINN.  
**LOCK & DAM NO. 6**  
 IN 2 SHEETS SCALE AS SHOWN SHEET NO.  
 CORPS OF ENGINEERS U.S. ARMY  
 OFFICE OF THE DISTRICT ENGINEER  
 ST. PAUL DISTRICT ST. PAUL, MINN.  
 U.S.G.P. FORM 11977



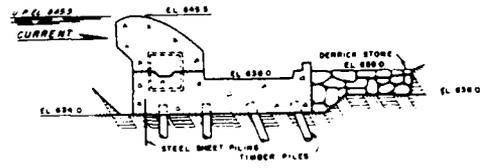
**SECTION A-A**  
TAINTER GATE  
0 0 10 20 30  
SCALE IN FEET



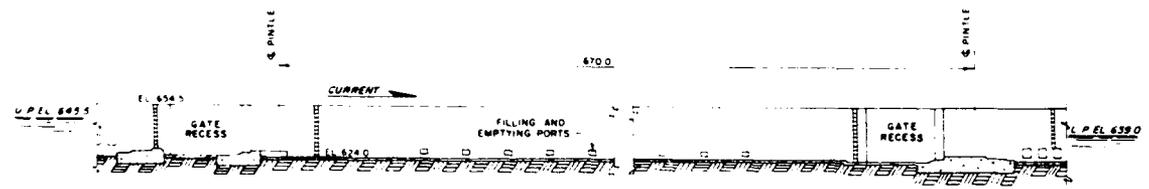
**SECTION B-B**  
ROLLER GATE  
0 0 10 20 30  
SCALE IN FEET



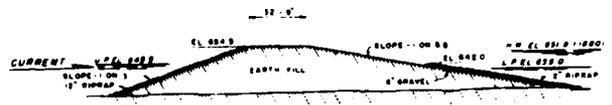
**SECTION C-C**  
LOCK  
20 0 20 40 60  
SCALE IN FEET



**SPILLWAY SECTION**  
5 0 5 10 15  
SCALE IN FEET



**SECTION X-X**  
MAIN LOCK  
20 0 20 40 60  
SCALE IN FEET



**EARTH DIKE SECTION**  
20 0 20 40 60  
SCALE IN FEET

ELEVATIONS ARE REFERRED TO M.S.L. (1912 ADJ.)

**RIVER & HARBOR PROJECT**  
**MISSISSIPPI RIVER**  
**MISSOURI RIVER TO MINNEAPOLIS, MINN.**  
**LOCK & DAM NO. 6**  
N 2 SHEETS SCALE AS SHOWN SHEET NO 2  
CORPS OF ENGINEERS U.S. ARMY  
OFFICE OF THE DISTRICT ENGINEER ST. PAUL, MINN.  
ST. PAUL DISTRICT ST. PAUL, MINN.  
30 SEPTEMBER 1977

EMERGENCY IDENTIFICATION SUBPLAN

APPENDIX A

TO

EMERGENCY PLAN

FOR

LOCK AND DAM NO. 6 TREMPLEAU, WISCONSIN

July 1986

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## EMERGENCY IDENTIFICATION SUBPLAN

### LOCK AND DAM NO. 6 TREMPAULEAU, WISCONSIN

#### A-1. Introduction

Conditions affecting operation of Lock & Dam No. 6 could result in a hazard to life and/or property due to high reservoir levels and/or sudden release of large volumes of water. Early identification of the existence or potential for occurrence of such conditions is essential as a basis for initiating emergency operations and/or repairs and for issuing appropriate notifications to higher authority and potentially affected parties.

##### a. Purpose

This subplan implements a portion of the Corps program to prepare emergency plans for all Corps dams. It established procedures for identifying impending and existing emergencies affecting the operation and safety of Lock and Dam No. 6.

##### b. Scope

This subplan deals with identification of impending or existing emergencies related to operation error, excess seepage, foundation failure, abutment failure, extreme storm, equipment failure and upstream dam failure. Instructions are included concerning:

- (1) Monitoring and reporting of conditions.
  - (a) Routine - during duty hours. Monday thru Friday (0730-1630).
  - (b) Non-routine - on a 24 hr. basis or as directed by District Office. Additional personnel may be required at discretion of the Area Lockmaster.
- (2) Communications between the project office, St. Paul District Office and Area Lockmaster's Office.
- (3) Criteria for action including declaration of a pre-emergency or emergency condition and activations of the Notification Subplan.

##### c. Applicability

This subplan is applicable to all Corps elements and field offices concerned with operation of Lock and Dam No. 6.

A-2. Responsibility for Conduct

a. Lockmaster

- (1) Carrying out routine surveillance (paragraph A-3a).
- (2) Carrying out non-routine observations and measurements as directed by the District (paragraph A-3b).
- (3) Advising District of potentially hazardous situations (paragraph A-3c).
- (4) Maintaining proper records of communications (paragraph A-4).
- (5) Acting independently, when required by disruption of communications or the urgency of the circumstances, to declare a pre-emergency or emergency condition (paragraph A-7) and to activate the Notification Subplan.

b. Area Lockmaster

- (1) Provide direction and supervision to the Lockmaster in coordination with the District Office.
- (2) Providing assistance to District as requested.
- (3) Assuming responsibilities of District in event of disruption of communications between the project area and District Office.

c. District

- (1) Carrying out routine monitoring of conditions potentially affecting regulation of Lock and Dam No. 6 (paragraph A-5a) and alerting the Area Lockmaster and Lockmaster of situations requiring increased readiness and/or 24-hour supervision.
- (2) Providing guidance to the Area Lockmaster and Lockmaster on all potentially hazardous situations which arise and directing any non-routine observations and measurements needed to assist in identification, confirmation or analysis of existing or impending threats to safe operation of the dam (paragraph A-5b)

- (3) Providing personnel for on-site evaluation of potentially hazardous conditions relating to geology, soils and other aspects requiring expert analysis.
- (4) Declaring the existence of pre-emergency and emergency conditions and directing activation of the Notification Subplan.
- (5) Maintenance of the subplan (paragraph A-8).

A-3. Observations, Tests and Reports by Lockmaster

a. Routine Observations and Tests (All entered in daily log).

(1) Daily.

- (a) Local 24 hr. precipitation, 7 a.m. temperature and wind velocity.
- (b) Pool and tailwater elevations for Lock and Dam 6, every 4 hours.
- (c) Gate setting, Lock and Dam 6.
- (d) Discharge every 8 hours.
- (e) Seasonal
  - (1) Navigation Season - Daily Commercial, River Traffic Count
  - (2) Winter Conditions - Biweekly Ice Conditions

(2) Monthly at Lock and Dam 6.

- (a) Visual inspection for excess seepage of downstream face of embankment, spillway, overflow spillway, abutment areas and valley floor immediately downstream of dam.
- (b) Visual inspection for slope failure and condition of both faces of all embankments.

(3) At request of District

- (a) Snow cover, water content (seasonal).
- (b) Test radio and other communications equipment.

b. Non-routine Observations and Tests

- (1) Perform comprehensive snow surveys as requested (seasonal).
- (2) Perform comprehensive examination of seepage (amount, rate of change of flow and presence of fines) whenever potential problems are observed.
- (3) Monitor precipitation gages on hourly basis when significant rains are occurring as directed by District Office.
- (4) Examine all areas of embankment at a time interval that will give ample warning of possible slope failure (typical time interval would be hourly). Inspections are to be continued as directed by the District.
- (5) Perform other observations and tests as directed by District.

c. Reports

- (1) To the Chief, Water Control Center
  - (a) Reports precipitation of 1.5 inches or more in 24-hours or less in the vicinity of the dam.
  - (b) Pool elevation above normal seasonal.
  - (c) Reported severe ice conditions or temporary constrictions downstream of dam.
  - (d) Any conditions likely to require a change in gate operations or mode of regulation.
- (2) To the Chief, Geotechnical Design Section
  - (a) Any conditions indicating distress of an embankment.
  - (b) Indications of unusual seepage.

A-4. Records

The Lockmaster logs all telephone, radio or other communications received from or sent to the District Office. This log is a bound ledger or notebook used only as an official diary. Each communication includes:

- a. Date

- b. Time
- c. Person called or calling
- d. Information transmitted/instructions received
- e. Action requested by the District
- f. Action taken in response to request
- g. Result of action
- h. Remarks
- i. Name of operator issuing information/orders
- j. Initials of person receiving communications

A-5. Observations, Tests and Alerts by District

- a. Daily Routine Observations and Alerts by District
  - (1) Check weather forecasts for areas affecting runoff.
  - (2) Check concurrence of pool level readings from staff gage and recording gage.
  - (3) Record, review and analyze piezometers and check with Geotechnical Design Section.
- b. Non-routine Observations and Tests

Specify additional observations and tests by the Lockmaster and make additional observations and tests as necessary to:

- (1) Assure proper functioning of all instrumentation.
- (2) Assist in identification, confirmation or analysis of existing or impending threats to safe operation of the dam.

- c. Alerts

Provide alerts to Lockmaster and appropriate District personnel when:

- (1) Weather, ice or other conditions require increased readiness and surveillance or the possible need for activation of the Emergency Operating Center.
- (2) Consideration is being given to declaration of a pre-emergency or emergency condition.

A-6. Communications

a. Normal

Communications between the District and Lockmaster will normally be by radio. Radios at the Hastings Message Center and District's Emergency Operating Center will be manned on a 24-hour basis during all flood emergencies and whenever a pre-emergency or emergency condition is in effect. Radio frequencies and call letters for pertinent parties are listed in Appendix C. (See Annex C to ER 500-1-1, Reference 24).

b. Back-Up

The telephone communications network between the District Office and Area Lockmaster Office will be used to back-up radio communications. Office and home phone numbers of key District and Area Lockmaster Office personnel are listed in Appendix C.

c. Emergency

During a situation when both radio and telephone communications between the District Office and project are disrupted, others equipped with radio or telephone facilities will be called on for assistance. Those to whom applications for assistance may be made are listed in Appendix C along with information for telephone and radio contacts.

A-7. Declaration of Pre-emergency and Emergency Conditions

a. Responsibility

The District is responsible for the declaration of "Pre-emergency" or "Emergency" conditions in all but extreme cases where the loss of communications or the speed of onset of a situation prevents the Lockmaster from conferring with the District.

Pre-emergency and emergency declarations will be made by the Commander/District Engineer. The Dam Safety Committee will provide recommendations to the District Engineer.

b. Conditions Warranting Declaration

Not every situation requiring declaration of a pre-emergency or an emergency condition can be specified. Initiative must be exercised by all involved personnel and each situation judged individually on the basis of all relevant factors.

(1) Pre-emergency

Examples of circumstances warranting declaration of a pre-emergency condition include:

- (a) Spring runoff is always handled as a pre-emergency condition. During the remainder of the year, the National Weather Service flood stage at the control point, or more shall be the warranting factor.
- (b) Malfunction of flood control gate system during flood operations which impedes release of water and creates potential for spillway flow.
- (c) Minor seepage problems including: unexplained increases or decreases in amount, cloudy appearance of seepage or presence of fines, development of new seepage areas as indicated by soft boggy areas or new or lush vegetation and substantial unexplained fluctuation in piezometer readings.
- (d) Minor slope failures including: tension cracks at crest or in slopes of embankment, small bulges in slopes or in foundation near toe of slope, small depressions or sags in crest or slopes, changes in horizontal crest alignment and gullies forming in or near embankment or junction of the embankment and abutments.
- (e) Threats or sabotage or occurrence of sabotage of non-critical project features.

(2) Emergency

Examples of conditions warranting declaration of an emergency condition include:

- (a) Lock and dam is at or over the National Weather Service flood at the control point and the stage at the control point is increasing.
- (b) Major seepage problems including: large increases in piezometer readings, movement of large amounts of material in existing or new seeps, pipes in embankment or foundation materials, seepage at higher elevations on downstream face of dam or in abutment areas and substantial increases in normal seepage amounts (especially when associated with movement of material from embankment or foundation).

(c) Major slope failures including: appreciable depressions or sloughs in the crest or slopes of the dam or bulges in the slopes or foundation, large gullies developing and continuing to erode in the embankment or at the junction of the embankment and abutments, displacement of structures or instrumentation on the dam and continuing expansion of tension cracks after their appearance on the dam crest or slope.

(d) Threats of sabotage or occurrence of sabotage to critical project features.

c. Action Upon Declaration

(1) Lockmaster

(a) Staff telephones as directed by District Office.

(b) Activate appropriate portions of Notification Subplan.

(c) Maintain monitoring/surveillance of situation responsible for declaration.

(d) Perform non-routine observations and tasks as directed by District.

(e) Test radio communication.

(f) Request assistance needed from District to perform (a) through (e) above.

(2) Area Lockmaster

(a) Monitor telephone on 24-hour basis

(b) Place all personnel on standby for emergency duty if directed by District Office.

(c) Test radio communications.

(3) District

(a) Activate Emergency Operation Center.

(b) Staff selected telephones on 24 hour basis.

(c) Test radio communications.

- (d) Place key staff on standby for emergency duty.
- (e) Provide detailed instructions to Lockmaster for any needed evaluation of situation.
- (f) Dispatch personnel to dam site as required to provide expert evaluation of situation and to assist Lockmaster as needed.
- (g) Activate appropriate portions of Notifications Subplan.

A-8. Subplan Maintenance

a. Updating

This subplan shall be updated as needed by the Dam Safety Officer, including:

- (1) Annually
- (2) Whenever needed by modifications in instrumentation at or affecting the project, dam operating procedures, overall District emergency procedures and/or changes of personnel.

b. Testing

The Chief, Project Operations Branch, shall annually direct a thorough inspection of all mechanical, electrical and other equipment pertinent to conduct of this subplan. The inspection shall include all tests, servicing and calibration necessary to insure proper functioning.

c. Familiarization

The Dam Safety Officer shall insure all pertinent Corps personnel are aware of and familiar with this subplan including:

- (1) Circulation of each updated version for review and signature by pertinent District staff. Area Lockmaster and the Lockmaster
- (2) Annual review session with staff of the Water Control Center and Lockmaster.
- (3) Briefing, within two weeks of assuming duties, of all new Water Control Center staff.
- (4) Briefing, before assumption of duties, of any new Lockmaster.

EMERGENCY NOTIFICATION SUBPLAN

APPENDIX B  
TO  
EMERGENCY PLAN  
FOR

LOCK AND DAM NO. 6 TREMPPEALEAU, WISCONSIN

July 1986

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## EMERGENCY NOTIFICATION SUBPLAN

### LOCK AND DAM NO. 6 TREMPAULEAU, WISCONSIN

#### B-1. Introduction

Conditions affecting operation of Lock and Dam No. 6 could result in a hazard to life and/or property due to high reservoir levels as the result of design floods and/or sudden release of large volumes of water. Prompt issuance of appropriate notifications, is essential for minimizing hazards to life and property.

##### a. Purpose

This subplan implements a portion of the Corps program to prepare emergency plans for all Corps dams. It establishes procedures for issuing notifications of impending and existing emergencies affecting the operation and safety of Lock and Dam No. 6.

##### b. Scope

This subplan specifies notifications and other actions to be taken upon declaration of a pre-emergency or emergency condition. Notifications and actions specified are those necessary for:

- (1) Insuring safety.
- (2) Vacating project areas where emergency operations and repairs may be conducted.
- (3) Internal coordination of Corps of Engineers activities.
- (4) Coordination with non-federal units of government and other Federal agencies.

##### c. Applicability

This subplan is applicable to all Corps elements and field offices concerned with operation of Lock and Dam No. 6.

#### B-2. Basis of Activation

This subplan is to be activated immediately upon declaration of a pre-emergency or emergency condition.

**B-3. Parties to be Notified**

**a. Corps Offices**

Corps Offices to be notified of all pre-emergency or emergency conditions that are declared are listed in Appendix C.

**b. Other Parties**

Other parties to be notified according to the nature of an emergency or pre-emergency condition are listed in Appendix C.

**c. For High Pool Levels**

Additional parties to be notified in the event of anticipated high pool levels are listed in Appendix C.

**B-4. Responsibility for Notification**

Notification listed in Appendix C are the responsibility of the office (Area Lockmaster, Lockmaster or District) making the declaration of a pre-emergency or emergency condition. Assistance in making notifications may be requested from other Corps offices and/or other parties. In the event all communications between offices are disrupted after declaration of a pre-emergency or emergency declaration, each office will assume responsibility for making all notifications.

**B-5. Communications**

**a. Corps Offices**

**(1) Normal**

Communications between the District and Lockmaster, are normally by radio. Radios at the Lock & Dam Central Control Station and District's Emergency Operating Center will be manned on a 24-hour basis during all flood emergencies and whenever a pre-emergency or emergency condition is in effect. Information on radio frequencies and call letters for key contacts are listed in Appendix C.

**(2) Back-up**

The telephone communications network between the District Office, project administration office and Area Lockmasters will be used to back-up radio communications. Telephones at each office will be manned as required during all flood emergencies and whenever a pre-emergency or emergency condition is in effect and radio service is

disrupted. (Office and home phone numbers of key Corps personnel are listed in Appendix C.

(3) Emergency

During a situation when both radio and telephone communications between the District Office and project area are lost, others equipped with radio or telephone facilities will be called on for assistance. Those to whom application for assistance may be made are identified in Appendix C along with information for telephone numbers.

b. Other Parties

(1) Normal

Communications with other parties will normally be by telephone. Office and home phone numbers of key contacts are listed in Appendix C.

(2) Back-up

Communications with other parties will be by radio in the event telephone service is disrupted, see Appendix C.

B-6. Timing of Notifications

Parties listed in Appendix C are to be notified as soon as possible after declaration of a pre-emergency or emergency condition. Notifications listed in Appendix C are dependent on reservoir water elevation and other conditions and should be made as soon as a high probability of the eventual need for notification is predicted.

B-7. Content of Notification Messages

a. Corps Offices

Notifications are to include the key information needed as a basis for decision making and/or action including, as appropriate and to the extent possible, the following:

(1) Description of Situation

(a) Nature and severity of problems(s).

(b) Current and predicted reservoir conditions including water elevation, inflow and discharge.

- (c) Current and forecasted weather conditions.
- (2) Action Planned or Underway
  - (a) Type of corrective actions.
  - (b) Estimated time to complete corrective actions.
  - (c) Outlook for success.
  - (d) Assistance required/being furnished.
  - (e) Potential complications.
  - (f) Recommended evacuation.
- (3) Other
  - (a) Staff at dam site.
  - (b) Visitors at project
  - (c) Road conditions.

b. Other Parties

Notification messages are to include a description of the nature of impending or existing hazard, potential timing of its occurrence and recommendations for evacuation and other action (needed evacuation on project lands managed by the Corps will be directed rather than recommended).

**B-8. Pre-emergency Actions**

a. Lockmaster

For a Lockmaster declared pre-emergency or suspect pre-emergency situation, the Lockmaster must notify the Area Lockmaster.

If contact with the Area Lockmaster cannot be made, contact the Chief Lock & Dam Section, Project Operations Branch and/or Emergency Operations Center.

b. Area Lockmaster

Evaluate the situation and declare a pre-emergency condition if warranted.

Notify Dam Safety Officer, Chief Lock & Dam Section, Project Operations Branch and Emergency Operations Center.

Provide assistance as needed to Lockmaster and District Office.

c. District

(1) Dam Safety Officer

The Dam Safety Officer is to be kept informed of all conditions of the pre-emergency situation. Responsibilities include:

Responsible for identifying and/or providing the necessary engineering or technical support required to resolve the pre-emergency situation.

Evaluate the situation and declare a pre-emergency condition if warranted.

Notify the North Central Division Dam Safety Officer if the pre-emergency condition was declared by the Lockmaster, Area Lockmaster, or District Office.

Notify the Dam Safety Committee, the Emergency Operations Center and the Project Operations Branch of the situation.

(2) Project Operations Branch

Must be kept informed of all pre-emergency situations. Responsibilities include:

Responsible for identifying a person-in-charge of the pre-emergency situation. Also, responsible for matters involving normal dam operations and/or any other matters not covered by other District elements.

Responsible for contacting the Dam Safety Officer for engineering and technical assistance and keeping him informed of the situation. Also, contact the Emergency Operations Center and keep them informed of the situation.

Evaluate the situation and declare a pre-emergency condition if warranted.

Provide needed assistance and/or instructions to the Area Lockmaster, Lockmaster and person-in-charge of the pre-emergency situation.

(3) Emergency Operations Center

Must be kept informed of all pre-emergency situations. Responsibilities include:

Twenty four (24) hour telephone service.

Responsible for contacting Dam Safety Officer, Project Operations Branch, District Engineer, Public Affairs and the NCD Emergency Manager.

Responsible for matters involving National Security, Disasters and Mobilization. Provide emergency response in accordance with ER 500-1-1, National Disaster Procedures.

Evaluate the situation and declare a pre-emergency condition if warranted.

(4) Others

The District personnel listed under this category are only to be contacted if none of the above District Elements could be reached. Responsibilities include:

Evaluate the pre-emergency conditions and declare a pre-emergency condition if warranted.

If the Project Operations Branch cannot be contacted, appoint a temporary person-in-charge of the pre-emergency situation.

Provide needed assistance and/or instructions to Area Lockmaster, Lockmaster and person-in-charge of the pre-emergency situation.

B-9. Emergency Actions

The order in which the following emergency actions are to be performed would depend on the type and timing of occurrence of the emergency situation. Priority should always be given to the immediate safety of any endangered human life. For example, in the case of a failure at normal pool, low tailwater; since this situation provides the greatest hazard to life and is the fastest occurring, the Lockmaster would first want to take action to notify and evacuate areas in the vicinity of the lock and dam area. Then the Lockmaster would proceed with the other emergency actions and notifications.

a. Lockmaster

- (1) For a Lockmaster declared emergency, the Lockmaster must notify the Area Lockmaster.

If contact with the Area Lockmaster cannot be made, contact the Dam Safety Officer, Project Operations Branch and Emergency Operations Center.

- (2) Cancel normal work schedule and provide for 24 hour duty as needed.
- (3) Access project areas which are or may become unsafe including but not limited to:
- (a) Reservoir water surface.
  - (b) Day use and recreational areas within project boundaries including those managed by others.
- (4) Identify areas required for conduct of emergency operations and repairs including any necessary access routes.
- (5) Take action to notify and evacuate areas which are unsafe, potentially unsafe or where emergency operations and repair work may be carried out including, as appropriate.
- (a) Directing evacuation of affected project areas managed by the Corps.
  - (b) Closing project roads to incoming traffic.
  - (c) Moving equipment to safe areas.
- (6) Request assistance as needed in carrying out items (5) (a) and (5) (b) above from agencies listed in Appendix C.
- (7) Assume District responsibilities for notifications if emergency condition was declared by Lockmaster.
- (8) Verify appropriate warnings if announced over local radio and television.

b. Area Lockmaster

Evaluate the situation and declare an emergency condition if warranted.

Notify Dam Safety Officer, Project Operations Branch and Emergency Operations Center.

Provide assistance to Lockmaster or District as required to accomplish the following tasks:

- (1) Cancel normal work schedule and provide for key staff as needed.
- (2) Assess project areas which are or may become unsafe including but not limited to:
  - (a) Reservoir water surface.
  - (b) Day use and recreational areas within project boundaries including those managed by others.
- (3) Identify areas required for conduct of emergency operations and repairs including any necessary access routes.
- (4) Take action to notify and evacuate areas which are unsafe, potentially unsafe or where emergency operations and repair work may be carried out including, as appropriate.
  - (a) Directing evacuation of affected project areas managed by the Corps.
  - (b) Closing project roads to incoming traffic.
  - (c) Moving equipment to safe areas.
- (5) Request assistance as needed in carrying out items (4) (a) and (4) (b) above, from agencies listed in Appendix C.
- (6) Assume District responsibilities for notifications if emergency condition was declared by Lockmaster.
- (7) Verify that appropriate warnings are announced over local radio and television.

c. District

- (1) Dam Safety Officer
  - (a) The Dam Safety Officer is to be kept informed of all conditions of the emergency situation.

- (b) Responsible for identifying and/or providing the necessary engineering or technical support required to resolve the emergency situation.
  - (c) Evaluate the situation and declare an emergency condition if warranted.
  - (d) Notify the North Central Division Dam Safety Officer if an emergency condition was declared by the Lockmaster, Area Lockmaster or District Office.
  - (e) Notify the Dam Safety Committee, the emergency Operations Center and the Project Operations Branch of the situation.
- (2) Emergency Operations Center
- (a) Must be kept informed of all emergency situations.
  - (b) Responsible for identifying and/or providing the necessary engineering or technical support required to resolve the emergency situation.
  - (c) Evaluate the situation and declare an emergency condition if warranted.
  - (d) Notify the North Central Division Dam Safety Officer if an emergency condition was declared by the Lockmaster, Area Lockmaster or District Office.
  - (e) Notify the Dam Safety Committee, the emergency Operations Center and the Project Operations Branch of the situation.
- (3) Project Operations Branch
- (a) Must be kept informed of all emergency situations.
  - (b) Responsible for identifying a person-in-charge of the emergency situation. Also, responsible for matters involving normal Dam Operations and/or any other matters not covered by other District elements.

- (c) Responsible for contacting the Dam Safety Officer for engineering and technical assistance and keeping him informed of the situation. Also, contact the emergency Operations Center and keep them informed of the situation.
  - (d) Evaluate the situation and declare an emergency condition if warranted.
  - (e) Provide needed assistance and/or instructions to the Area Lockmaster, Lockmaster and person-in-charge of the emergency situation.
  - (f) Cancel normal work schedule and provide for key staff as needed.
  - (g) Determine which of the planning conditions represents potential inundation and needs for evacuation: (1) flood without failure, (2) flood with failure or (3) normal pool low tailwater dam failure.
  - (h) Determine need for warning of high reservoir levels.
  - (i) Formulate and issue warning message(s) to affected non-federal parties.
  - (j) Verify appropriate warnings as released over local radio and television.
- (4) Others
- (a) The District personnel listed under this category are only to be contacted if none of the above District personnel can be reached.
  - (b) Evaluate the emergency conditions and declare an emergency condition if warranted. Notify the Dam Safety Officer, the Emergency Operations Center and the Project Operations Branch as soon as possible.
  - (c) If the Project Operations Branch cannot be contacted, appoint a temporary person-in-charge of the emergency situation.
  - (d) Provide needed assistance and/or instructions to Area Lockmaster, Lockmaster and person-in-charge of the pre-emergency situation.

d. North Central Division

Notify the Office of the Chief of Engineers and other Federal agencies as appropriate.

e. Office of the Chief of Engineers

Notify other Federal agencies as appropriate, such as the Federal Emergency Management Agency.

B-10. Example Messages

Preparation of warning messages should begin as soon as their potential need is apparent so that they can be issued promptly upon declaration of an emergency condition. When time is available, all public notices should be released by the Public Affairs Office or contact Emergency Management or the Hastings Message Center, if the P.A.O. cannot be reached. In some cases, an emergency condition may be declared with little or no advance notice. The following example messages provide a model for the first announcements in such cases. The Public Affairs Office would then be contacted as soon as time permits. They would release subsequent announcements to provide additional details.

a. Announcement for Slowly Developing Conditions

THE ARMY CORPS OF ENGINEERS AT ST. PAUL ANNOUNCED AT (time) TODAY THAT AN EMERGENCY CONDITION EXISTS AT (name of Dam) DAM DUE TO general description of problem. THE DAM IS LOCATED ON (stream) ABOUT (distance) MILES UPSTREAM OF (name of downstream community and state).

A CORPS SPOKESMAN SAID THAT THE WATER LEVEL OF (Name of Reservoir) WAS BEING LOWERED (as a precautionary measure/to reduce pressure on the dam/to enable repair work).

THE SPOKESMAN EMPHASIZED THAT THE DRAWDOWN OF THE POOL WAS BEING CARRIED OUT UNDER CONTROLLED CONDITIONS AND THERE IS NO IMMEDIATE DANGER OF THE DAM FAILING. HOWEVER, THE LARGE RELEASES OF WATER THAT ARE BEING MADE MAY CAUSE FLOODING ALONG (stream). SHOULD (evacuate/be alert for high water and prepare to evacuate).

ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

b. Announcement for Rapidly Developing Conditions

URGENT: THE ARMY CORPS OF ENGINEERS HAS ANNOUNCED THAT (name of Dam) DAM IS IN IMMINENT DANGER OF FAILURE. THE DAM IS LOCATED ABOUT (distance) MILES UPSTREAM OF (Name of downstream community and state).

ATTEMPTS TO SAVE THE DAM ARE UNDERWAY BUT THEIR SUCCESS CANNOT BE DETERMINED AS YET. RESIDENTS ALONG THE (stream) SHOULD EVACUATE TO HIGH GROUND IMMEDIATELY. RESIDENTS ALONG THE (stream) SHOULD EVACUATE TO HIGH GROUND IMMEDIATELY. RESIDENTS ALONG THE (stream) IN THE VICINITY OF (city) AND DOWNSTREAM SHOULD REMAIN ALERT FOR FURTHER INFORMATION.

IF THE DAM FAILS, WATER WILL TAKE APPROXIMATELY (time) HOURS TO REACH THE LOWER END OF (city, stream, etc.). AREAS CLOSER TO DAM WILL BE FLOODED SOONER.

ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

c. Announcement for High Reservoir Levels

THE ARMY CORPS OF ENGINEERS AT ST. PAUL ANNOUNCED AT (time) TODAY THAT AN EMERGENCY CONDITION EXISTS AROUND (name of reservoir) DUE TO EXPECTED HIGH WATER LEVELS. THE LAKE IS LOCATED ON (stream) ABOUT (distance) MILES UPSTREAM OF (community and state).

THE CORPS SPOKESMAN SAID THAT THE WATER LEVEL IN THE LAKE WAS EXPECTED TO REACH ELEVATION (elev.) AT (time). DUE TO (general description of problem). THIS WATER LEVEL WILL (describe major effects).

LARGE RELEASES OF WATER ARE BEING MADE FROM THE DAM IN AN ATTEMPT TO CONTROL THE LAKE LEVEL. RESIDENTS OF LOW LYING AREAS ALONG (stream) SHOULD BE ALERT TO POSSIBLE FLOODING AND PREPARE TO EVACUATE.

FURTHER INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

FLOOD PROFILES AND OPERATING CURVES

APPENDIX C

TO

EMERGENCY PLAN

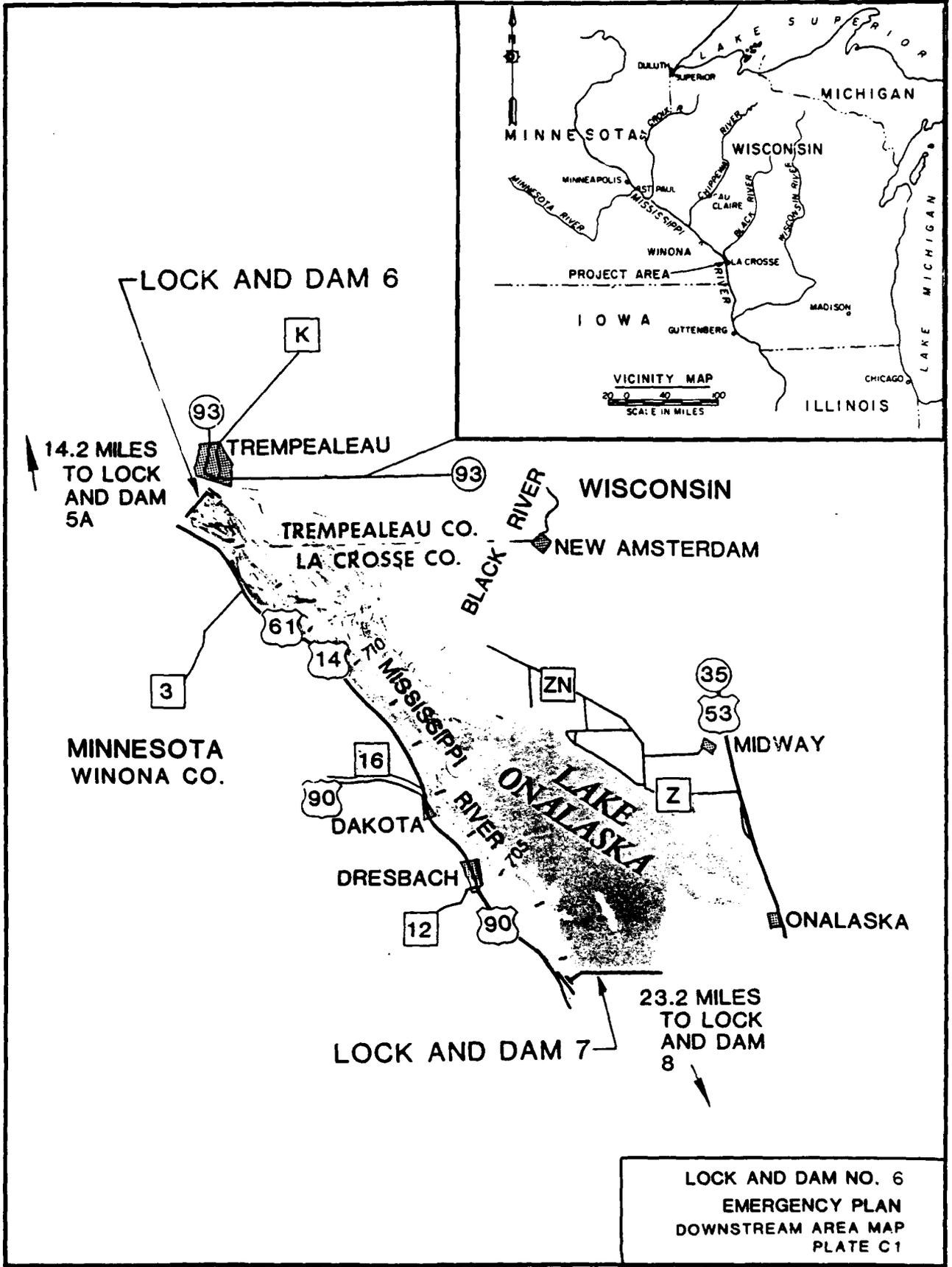
FOR

LOCK AND DAM NO. 6 TREMPLEAULEAU, WISCONSIN

July 1986

LIST OF PLATES

- C1 Downstream Area Map
- C2 Water Surface Profiles
- C3 Water Surface Profiles
- C4 Water Surface Profiles
- C5 Operating Curves
- C6 Notification Charts



LOCK AND DAM 6

K

14.2 MILES  
TO LOCK  
AND DAM  
5A

93

TREMPEALEAU

93

WISCONSIN

TREMPEALEAU CO.  
LA CROSSE CO.

NEW AMSTERDAM

BLACK RIVER

3

MINNESOTA  
WINONA CO.

61

14

TO MISSISSIPPI RIVER

ZN

35

53

MIDWAY

16

DAKOTA

LAKE ONALASKA

Z

DRESBACH

12

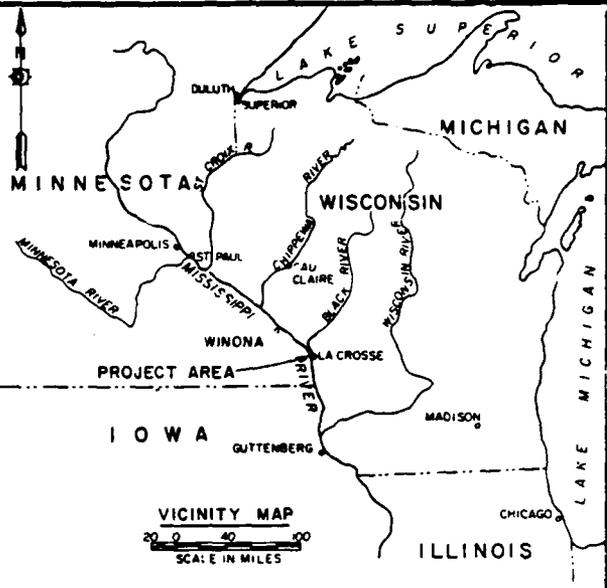
90

ONALASKA

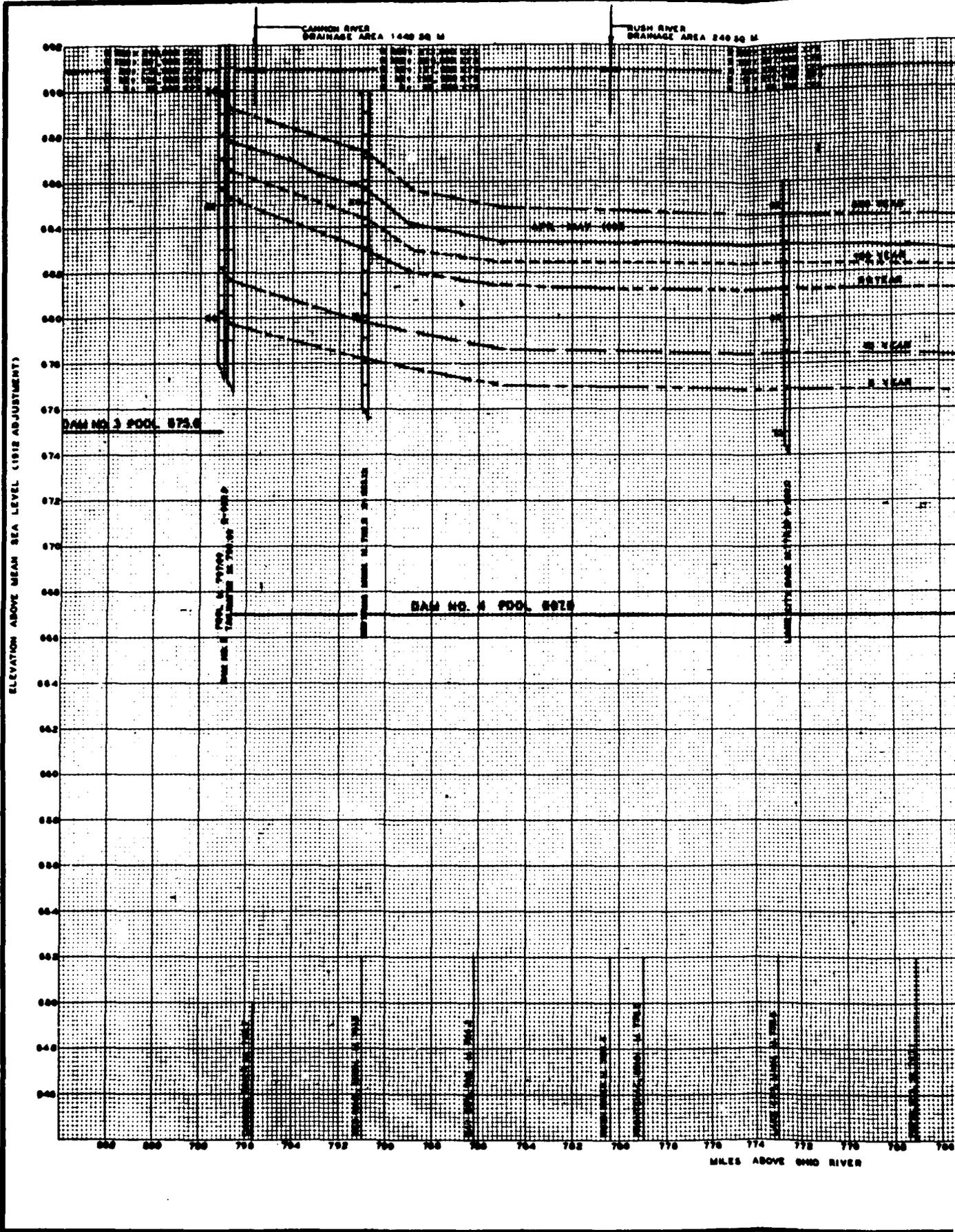
LOCK AND DAM 7

23.2 MILES  
TO LOCK  
AND DAM  
8

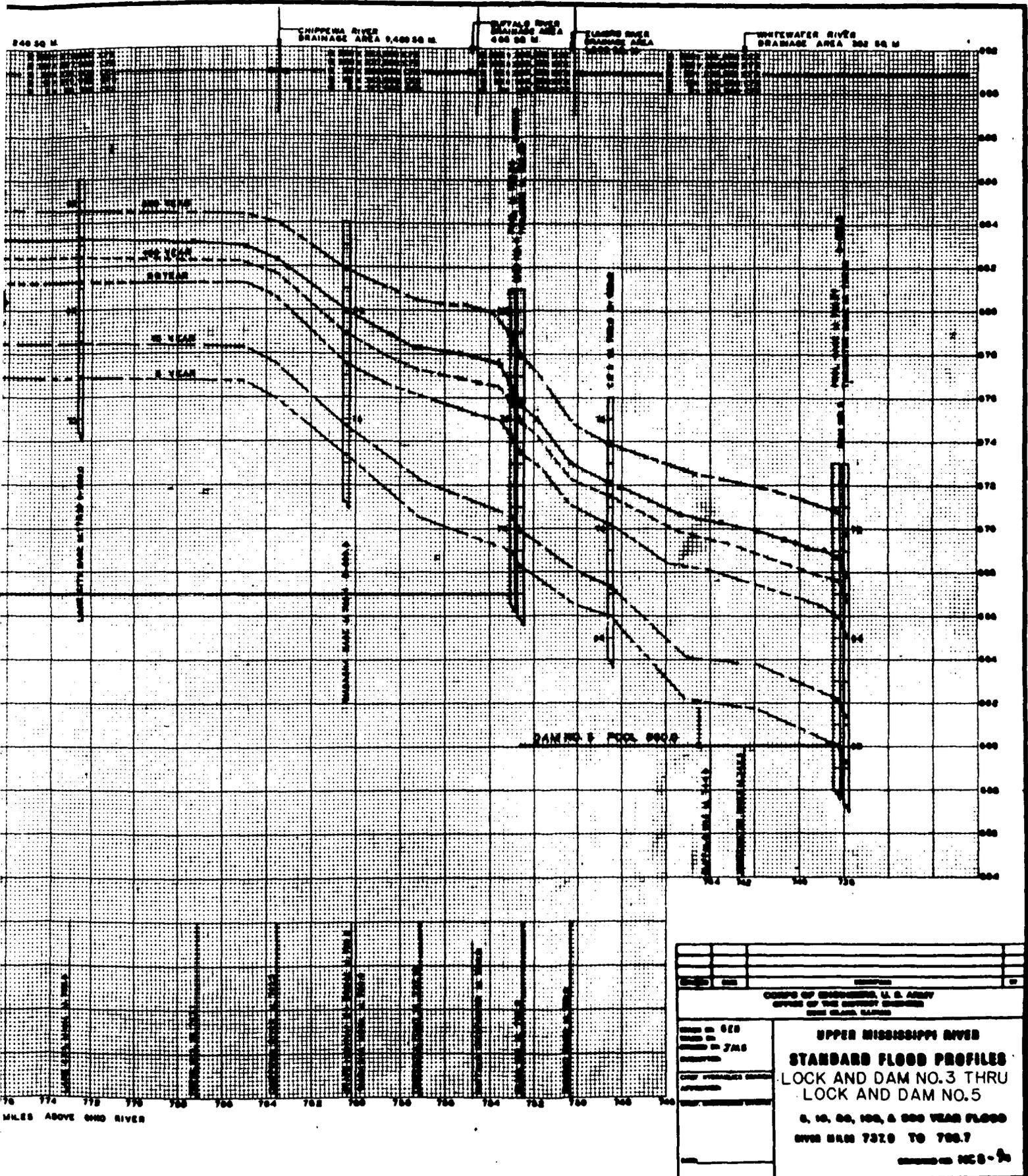
LOCK AND DAM NO. 6  
EMERGENCY PLAN  
DOWNSTREAM AREA MAP  
PLATE C1



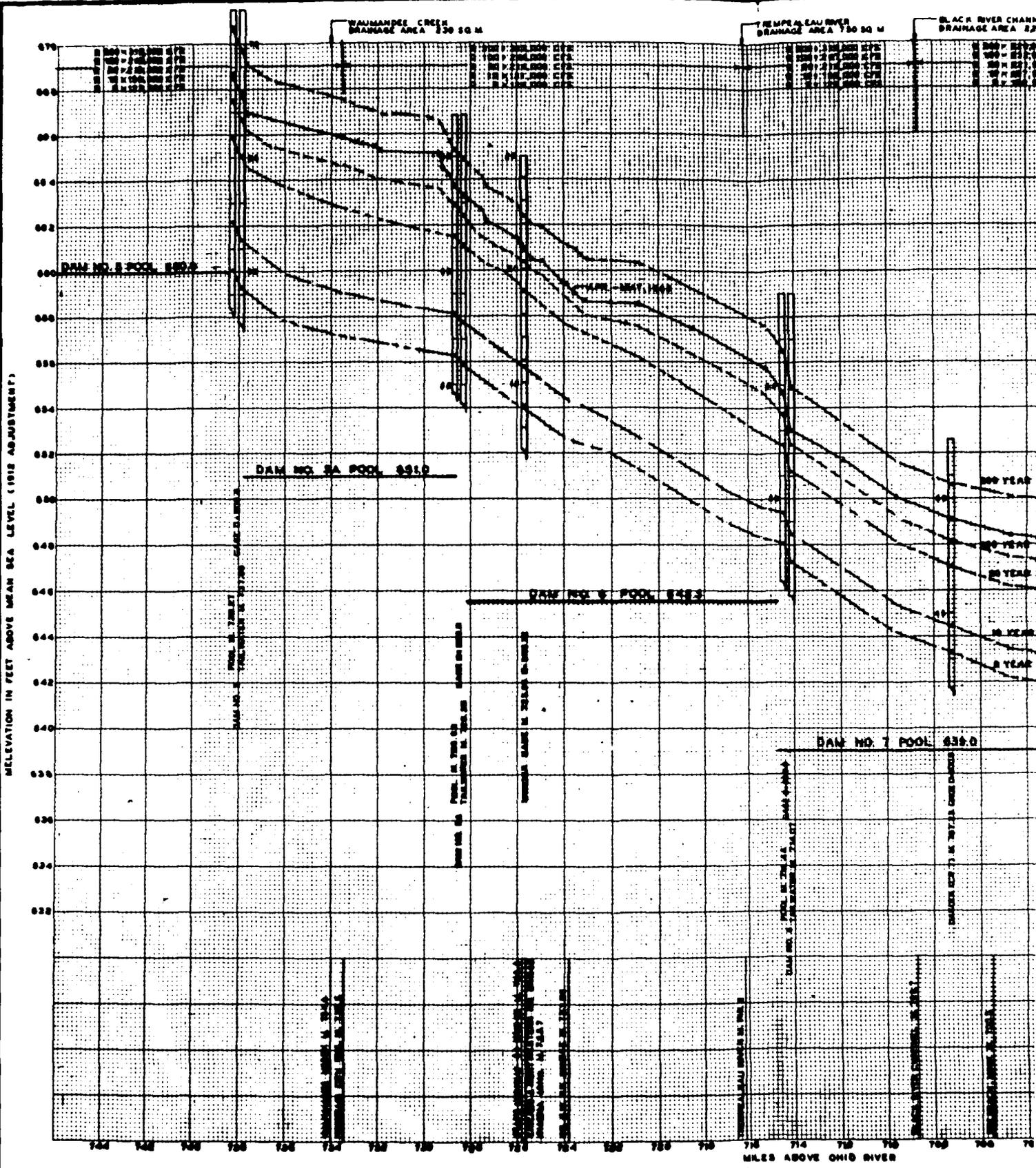
VICINITY MAP  
SCALE IN MILES

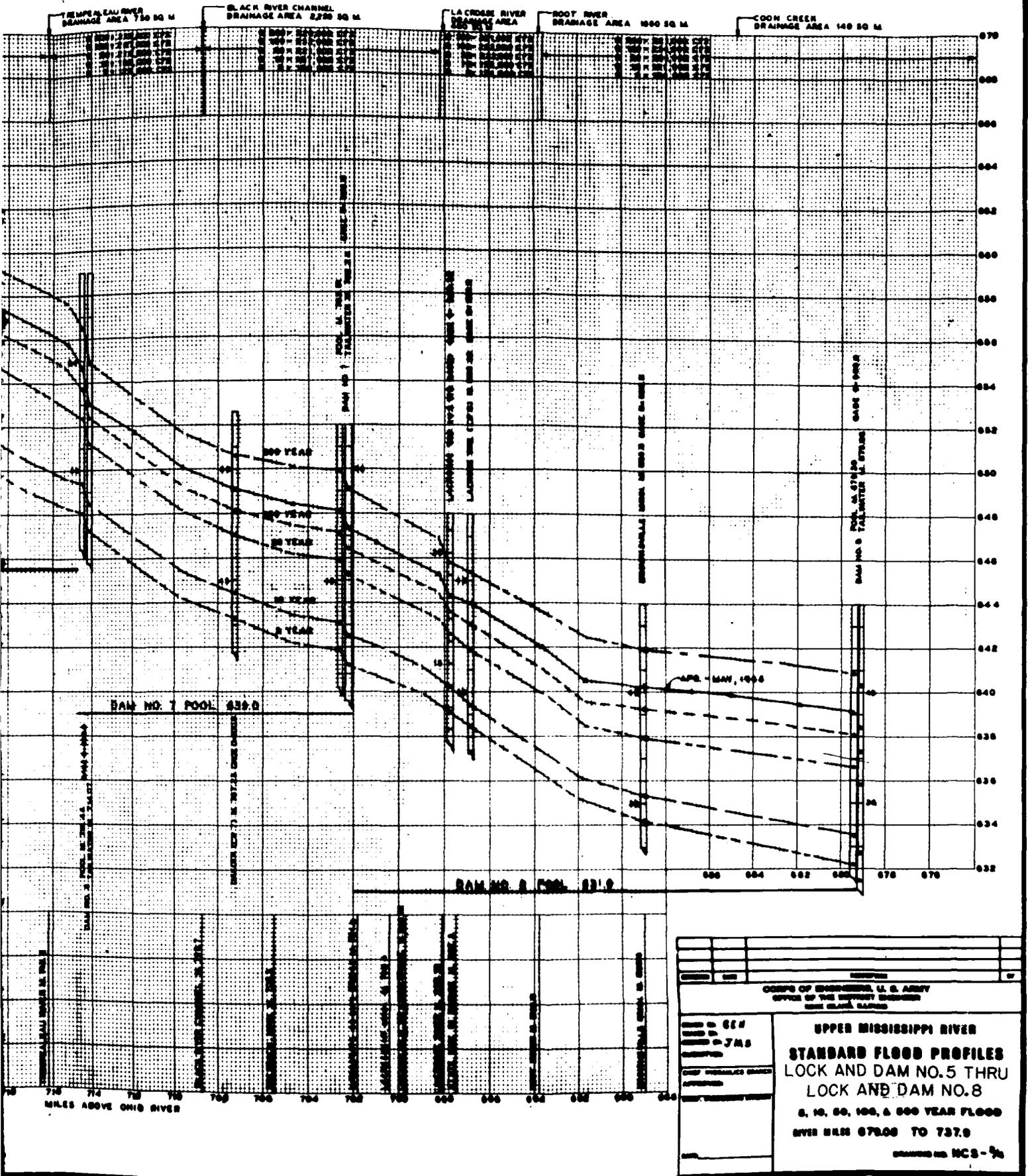


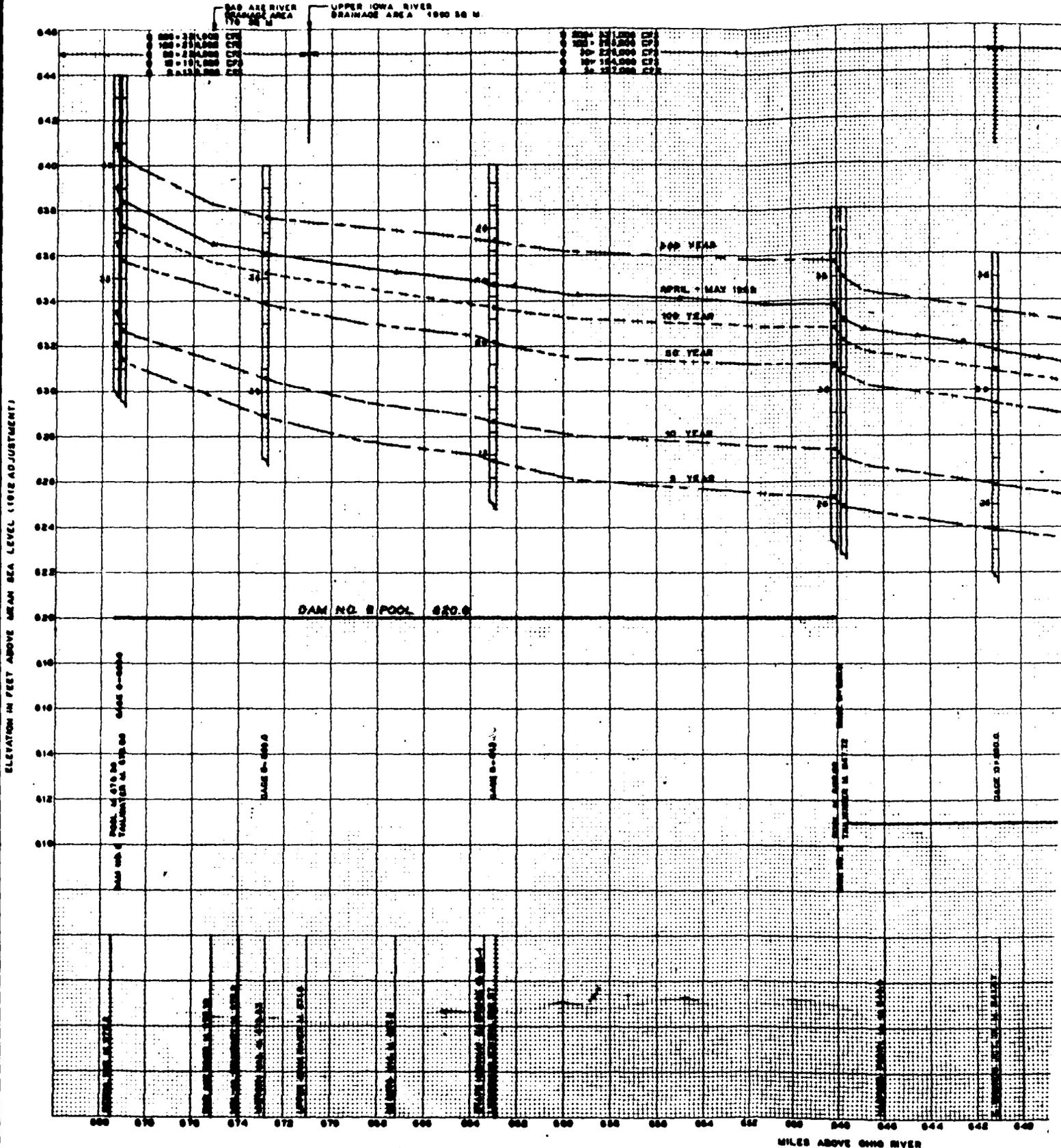
6-6

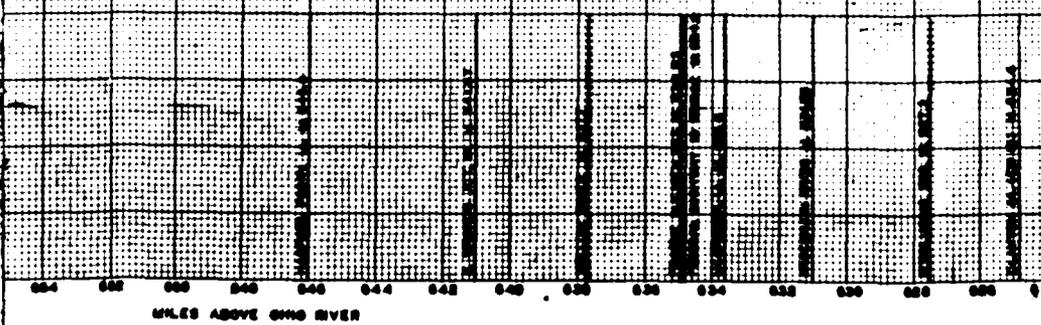
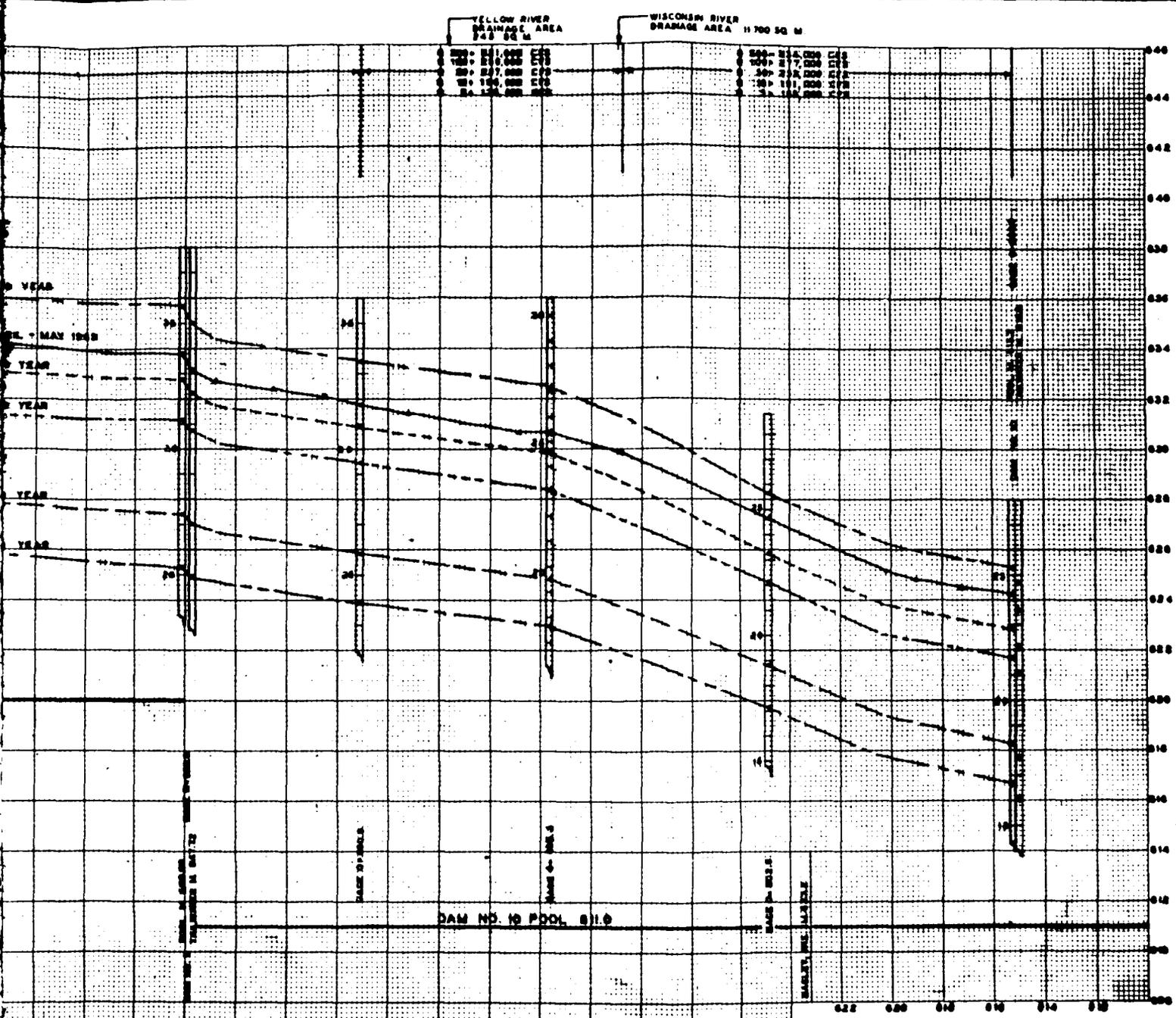


CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER SIEM BLAND, ILLINOIS	
<b>UPPER MISSISSIPPI RIVER</b>	
<b>STANDARD FLOOD PROFILES</b>	
<b>LOCK AND DAM NO. 3 THRU</b>	
<b>LOCK AND DAM NO. 5</b>	
<b>5, 10, 100, &amp; 500 YEAR FLOOD</b>	
<b>RIVER MILES 737.0 TO 788.7</b>	
DRAWN BY REC-74	



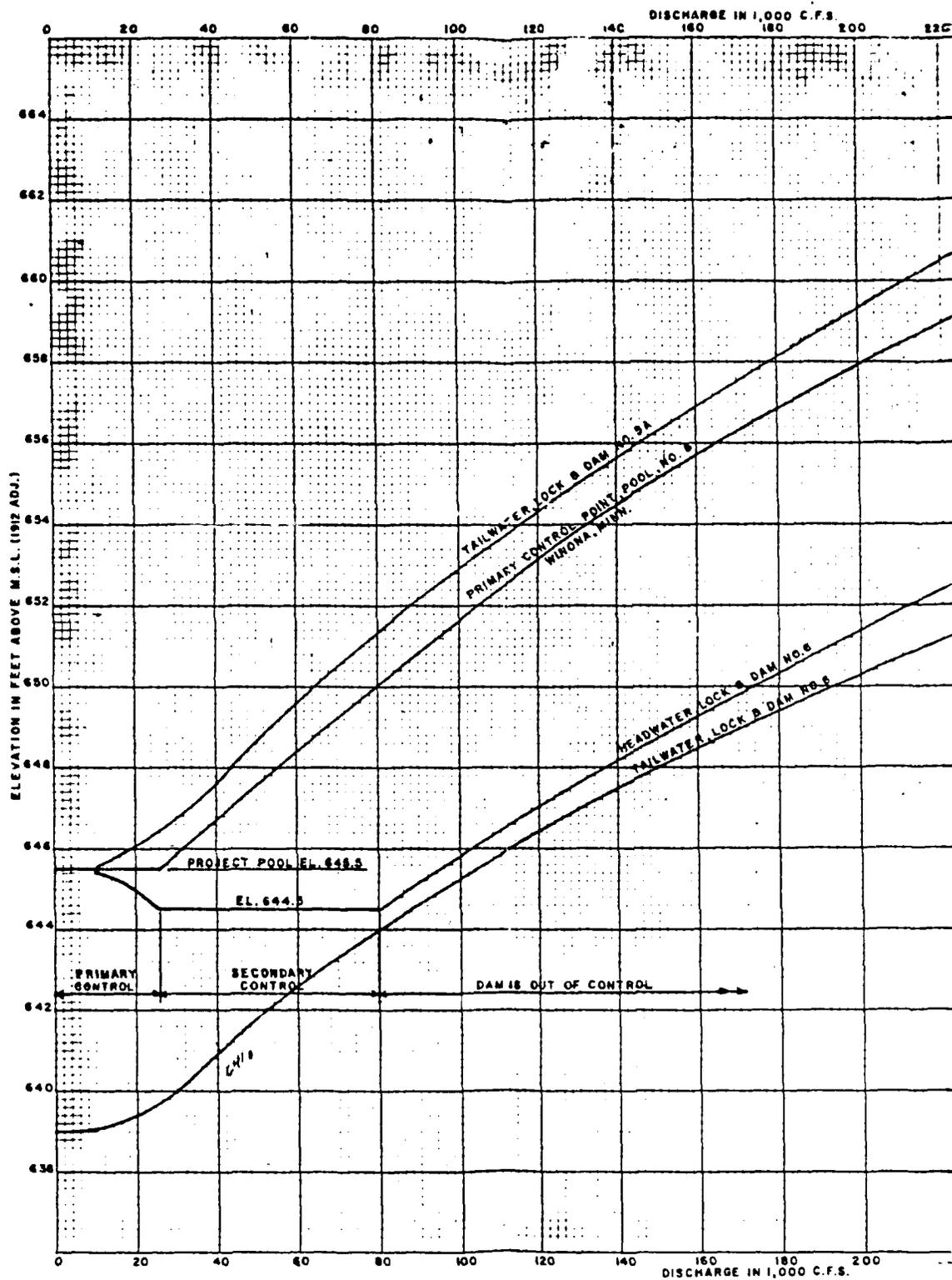




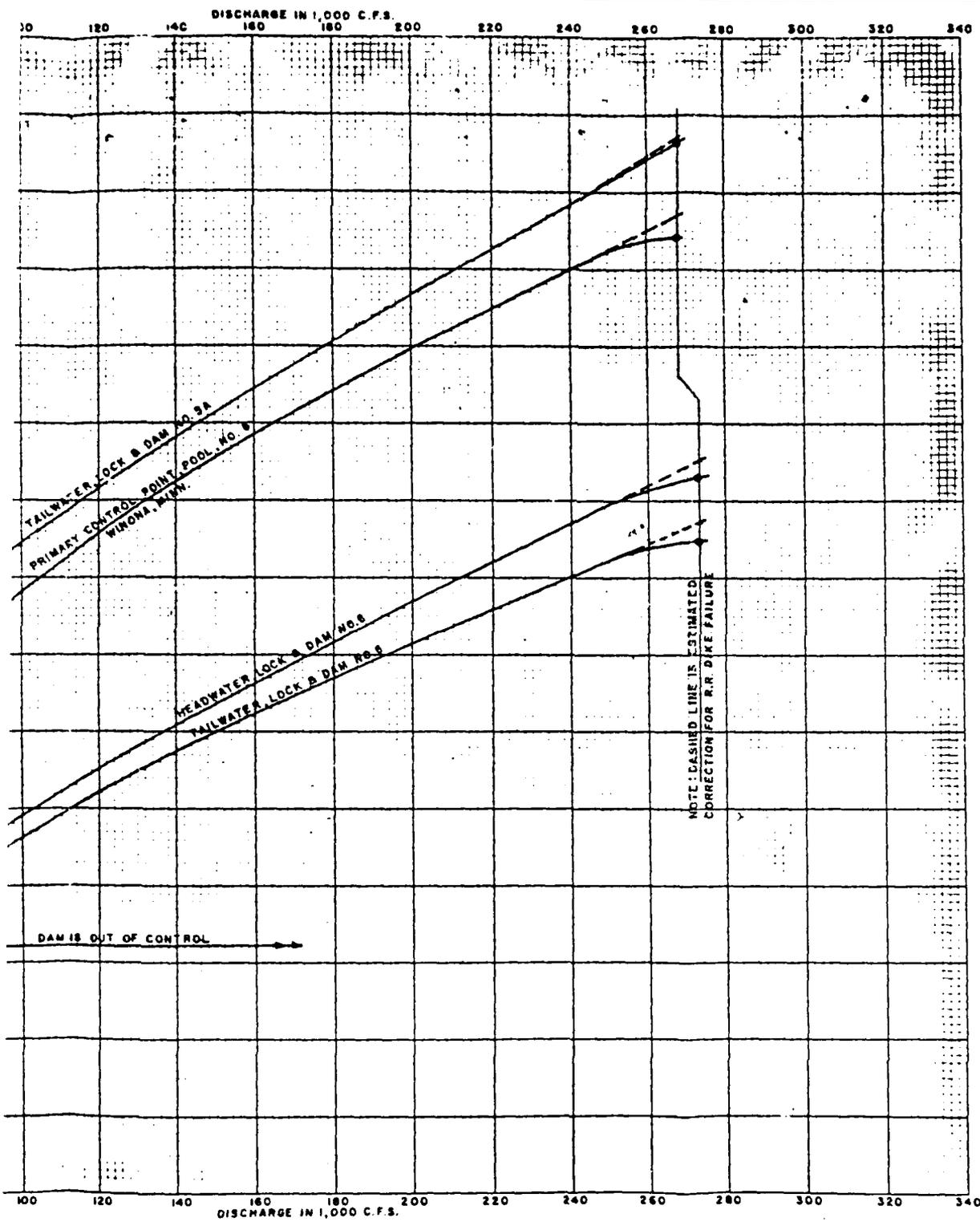


GROUP	
GROUP OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER UPPER MISSISSIPPI RIVER	
DESIGNED BY	GEN
DRAWN BY	JMS
CHECKED BY	
APPROVED BY	
DATE	

**UPPER MISSISSIPPI RIVER**  
**STANDARD FLOOD PROFILES**  
**LOCK AND DAM NO. 9 THRU**  
**LOCK AND DAM NO. 10**  
**5, 10, 20, 50, 100, 500 YEAR FLOOD**  
**RIVER MILES 615.0 TO 675.00**  
DRAWN BY NCS 70



1032



OPERAND  
 PL  
 UPPER

REVISED 25 JUNE 1974

PLF

2072

# NOTIFICATION FOR DAM PROBLEMS



US Army Corps  
of Engineers  
St Paul District

PROJECT LOCK AND DAM NO. 6



US Army Corps  
of Engineers  
St Paul District

## OBSERVER

1. Observe potential dam problem
  2. Gather pertinent facts to describe situation.
  3. Assess whether slowly developing, rapidly developing, or imminent failure.
  4. Notify first available lockmaster in order shown.
- (If contact cannot be made with Lockmasters listed below, contact the Dam Safety Officer, Project Operations Branch, or Emergency Operations center as shown on attached list.)

\*Lockmaster 608-534-6424      Radio SSB/FM WUD 606

Home Phone

\*Irvin Diamond      608-534-6663

1. Assess observer's report.
2. Take necessary emergency actions.
3. Notify Area Lockmaster, Dam Safety Officer, Project Operations Branch, or Emergency Operations Center.

Area Lockmaster 507-895-4133      Radio SSB/FM WUD 64

Home Phone

Charles L. Stevenson      608-648-3317

1. Assess the situation.
2. Take necessary emergency actions.
3. Notify Dam Safety Officer, Project Operations Branch, or Emergency Operations Center.

**DAM SAFETY OFFICER**

	Office	Home
Robert Post	(612)725-7566	(612)437-1316
William Goetz	(612)725-7541	(612)454-3722
Asst. Chief ED	(612)725-7566	(612)

**PROJECT OPERATIONS BRANCH**

	Office	Home
Thomas Oksness	(612)725-7563	(612)439-0272
Dennis Erickson	(612)725-7562	(612)452-6850
Dennis Cin	(612)725-7561	(612)455-6786

**EMERGENCY OPERATIONS CENTER**

	Office	Home
District EOC	(612)725-7511	(24-hr. number)
David Christenson	(612)725-7511	(612)690-5749

**DAM SAFETY COMMITTEE**

	Office	Home
William Goetz	(612)725-7541	(612)454-3722
Asst. Chief ED	(612)725-7566	(612)
Helmer Johnson	(612)725-7581	(612)633-7791
Robert Engelstad	(612)725-7586	(612)459-6343
Robert Fletcher	(612)725-7956	(612)484-4998
Dennis Cin	(612)725-7561	(612)455-6786
Ben Wopat	(612)725-7606	(612)386-9734
John H. Plump, Jr.	(612)725-7600	(612)455-7632

**DISTRICT ENGINEER**

COL Joseph Briggs
Office (612)725-7501
Home (612)894-7142

**PUBLIC AFFAIRS**

Kennon Gardner
Office (612)725-7507
Home (612)884-9023

**NCD EMERGENCY MANAGER**

Natural Disaster Planner
Bernard Bochantin
Office (312)353-5275
Home (815)568-7544
Chief Emergency Management
Tim Monteen
Office (312)886-8451
Home (312)961-2195

**NCD DAM SAFETY OFFICER\***

	Office	Home
*Zane Goodwin	(312)353-6311	(312)823-4606
Carl Cable	(312)353-6372	(312)357-4529
Don Leonard	(312)353-6355	(312)359-3372
Lee Hoglund	(312)353-6358	(312)579-0148

**OCE DAM SAFETY OFFICER\***

	Office	Home
*Lloyd Duscha	(202)272-0382	(703)860-1319
William McCormick	(202)272-0397	(703)569-4323
Jack Thompson	(202)272-0215	(703)978-5627
Edward Pritchett	(202)272-0207	(301)865-5876
Cecil Goad	(202)272-0196	(703)573-2704
Chief, Hydraulics and Hydrology Div.	(202)272-0228	

**DISTRICT RADIO**

Contact Hastings Message Center at (612)437-2210 (call letters - WUD6)
SSB Primary - 5400Khz
1st Alternate - 6020Khz
For additional Radio information see Appendix CNCS 500-1-1
Emergency - 5015KhzLSB

CITIES

Winona, MN POLICE DEPARTMENT (507) 454-6100 (24 hours)  
Trempealeau, WI POLICE DEPARTMENT (608) 534-6418

COUNTIES

Winona County Minnesota  
Sheriff (507) 454-6100 (24 hours)  
Civil Defense (507) 454-5718 (507) 452-7474

Trempealeau County Wisconsin  
Sheriff (715) 538-4351  
Civil Defense (715) 538-4351

LaCrosse County Wisconsin  
Sheriff (608) 784-2668  
Civil Defense (608) 784-2668

STATE AGENCIES

MN Division of Emergency Government (612) 296-2233 (612) 778-0800  
Region 1 Coordinator (507) 285-7459 (507) 285-0186  
WI Division of Emergency Government (608) 266-3232 (24 hours)  
West Area Director (608) 372-3251 (608) 372-3618  
WI State Patrol (608) 372-5998

FEDERAL AGENCIES

National Weather Service  
North Central River Forecast  
Center (612) 725-3400  
Fish and Wildlife Service (608) 783-6451  
District Office (507) 452-4232

GLOSSARY

## GLOSSARY

- Pre-emergency Condition - An identified impending or existing threat to the safe operation of the dam or reservoir in which no significant hazard to life or property is expected to occur.
- Emergency Condition - An occurrence of a significant hazard to life and/or property is possible or certain to occur.
- District - The U S Army Corps of Engineers, North Central Division, St. Paul District.
- Dam Safety Officer - The individual responsible for identifying and/or providing the necessary engineering or technical support required for the pre-emergency or emergency situation.
- Engineering Division - A division of the Corps responsible for all engineering matters.
- Construction & Operations Division - A division of the Corps responsible for construction, inspection, maintenance and normal operation of the dam.
- Planning Division - A division of the Corps responsible for management support and matters involving environmental analysis and cultural resources.
- Emergency Operations Branch - A branch of the Engineering Division responsible for matters involving national Operations security, disasters and mobilization.
- Design Branch - A branch of the Engineering Division responsible for matters involving the structural integrity of the removable dam and outlet structures.
- Geotechnical Hydraulics & Hydrology Branch - A branch of the Engineering Division responsible for matters involving the integrity of earth dams.
- Project Management Branch - A branch of the Engineering Division responsible for management support.

Water Control Center - Part of Hydrology Section in Geotechnical, Hydraulics and Hydrologic Engineering Branch. Responsible for matters involving reservoir regulation.

Project Operations Branch - A branch of the Construction and Operations Division responsible for matters involving dam operations and/or other matters not covered by the other District elements.

Area Lockmaster - The person in charge of the Lower, Central or Upper Area Lockmaster's Office.

Lockmaster - The dam tender or the individual in charge of the Lock and Dam.

River Mile - The distance along the channel of the Mississippi River measured from its confluence with the Ohio River.

Distance from Dam - The distance along the channel upstream or downstream from the dam.

Peak Elevation - The computed maximum water surface elevation which would be reached at a location due to assumed conditions. Datum is mean sea level (NGVD).

Cross Section - Point at which the shape of a stream channel or valley is measured, usually in a direction perpendicular to the direction of flow.

NGVD - National Geodetic Vertical Datum (distance above mean sea level).