AD-A165 550 FLOOD EMERGENCY PLAN MOUNT MORRIS DAM GENESEE RIVER WATERSHED NEW YORK(U) CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT OCT 85 1/2

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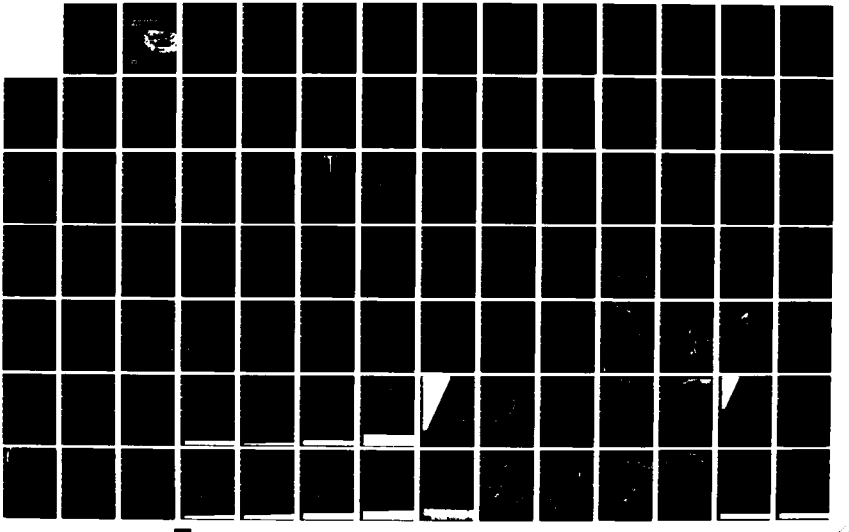
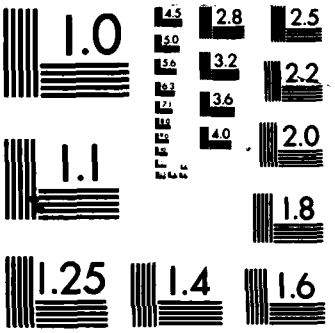




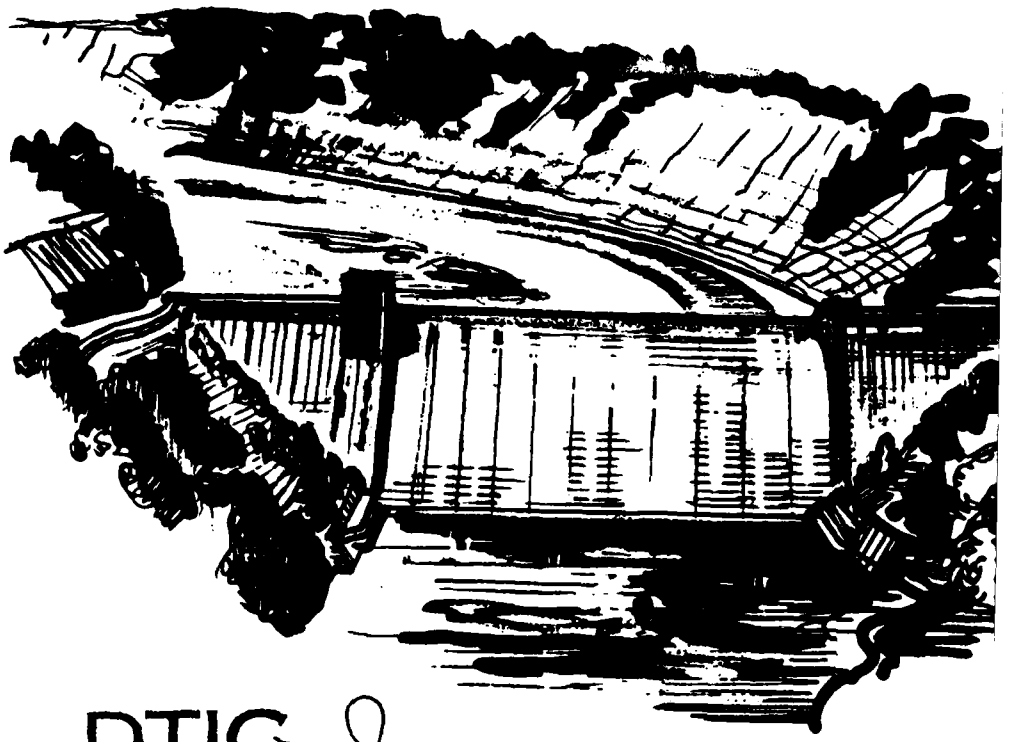
MICROCOPY RESOLUTION TEST CHART

Flood Emergency Plan

Mount Morris Dam

Genesee River Watershed

New York



US Army Corps of Engineers
Buffalo District

VOLUME 1

MAIN RPT., APP. B, C & D

OCTOBER 1985

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A165550	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Flood Emergency Plan For Mount Morris Dam Genesee River Watershed, New York (Volume 1 of 2 Volumes)		5. TYPE OF REPORT & PERIOD COVERED 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Flood Emergency Plan; Flood Warning Condiiton; Emergency Condition; Dam Foreman; District; Emergency Identification Subplan; Emergency Operations and Repair Subplan; Notification Subplan; Excavation Subplan; Spillway Design Flood (SDF); Probable Maximum Flood (PMF); Dam Failure; Flooded Area (Inumdation) Maps

20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The two-volume report provides the flood emergency plan for Mount Morris Dam. This document, Volume I, contains a Main Report and three Appendices (B,C,andD). The Main Report generally summarizes data found in the Appendices and utilizes suitable plates originally presented in Appendix A. Appendix B (Emergency Identification Subplan) describes procedures and means for assuring reliable identification and evaluation of potential, impending and existing emergency situations, affecting the operation and safety of the dam, related to the two failure conditions, the SDF/PMF without dam failure, and sabotage to project features. Appendix C

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. Continued

(Emergency Operations and Repair Subplan) specifies the emergency operations to be implemented and repairs to be considered upon "flood warning condition" and "emergency condition" declarations for cases of high reservoir level, excess seepage/internal drainage system malfunction, spillway discharges and dam failure. Appendix D (Notification Subplan) specifies notifications and other actions upon "flood warning condition" and "emergency condition" declarations, coordinated among the Corps of Engineers, National Weather Service, and state and local agencies.

NCDED-W (NCBED-DM/12 Nov 85) 1st End Mr. Vento/lj/353-6348
SUBJECT: Flood Emergency Plan, Mount Morris Dam

DA, North Central Division, Corps of Engineers, 536 South Clark Street, Chicago, Illinois 60605-1592 6 DEC 1985

TO: Commander, Buffalo District, ATTN: NCBED-DM

The revised plan, enclosed with the basic letter, adequately addresses the previous NCD comments. The emergency plan is approved. You are reminded to encourage local officials to proceed with the evacuation planning effort. A copy of your coordination letter to the local entities should be forwarded to NCDED-W.

FOR THE COMMANDER:

for JANE M. GOODWIN, P.E.
Chief, Engineering Division

wd all encl

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-DM

12 NOV 1985

SUBJECT: Flood Emergency Plan, Mount Morris Dam

Commander, North Central Division
ATTN: NCDED-W

1. Enclosed are five copies of the report entitled "Flood Emergency Plan, Mount Morris Dam", in two volumes dated October 1985. Volume 1 consists of the Main Report; Appendix B ("Emergency Identification Subplan"), prepared in 1984 and revised in 1985; Appendix C ("Emergency Operations and Repair Subplan"), prepared in 1984 and revised in 1985; and Appendix D ("Notification Subplan"), prepared and revised in 1985. Volume 2 consists of Appendix A ("Hydrology and Hydraulics"), prepared in 1980 and revised in 1984.

2. Request approval of the enclosed report. Upon your approval, copies will be appropriately distributed.

3. My point of contact pertaining to this matter is Mr. Peter Kuszczak, P.E. of my O&M Support Section who can be contacted at commercial number 716-876-5454, extension 2231 or FTS 473-2231.

4. The Buffalo District -- Leadership in Engineering.

DANIEL R. CLARK,
Colonel, Corps of Engineers
District Commander

1 Enclosure (Quint)
as stated

FLOOD EMERGENCY PLAN FOR MOUNT MORRIS DAM

GENESEE RIVER WATERSHED NEW YORK

1984
Revised 1985

MAIN REPORT

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Table of Contents

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Plates

FLOOD EMERGENCY PLAN FOR MOUNT MORRIS DAM

MAIN REPORT

1. PURPOSE AND SCOPE

1.1 General.

The complete report with Appendices provides the flood emergency plan for Mount Morris Dam. It deals with potential, impending, or existing emergency situations related to (a) two possible failure conditions, spillway design discharge with dam failure, and dam failure at full flood control pool; (b) spillway design discharge without dam failure and other discharges sufficiently large to cause flooding in downstream areas; and (c) threatened or actual sabotage to project features. It provides the various conditions, circumstances, and changes in instrumentation readings related to potential dam failure. It contains the hydraulic and hydrologic background and resultant inundation maps.

1.2 Appendices.

Specific information is provided in the following appendices:

a. Appendix A - Hydrology and Hydraulics (1980, revised 1984) - provided under separate cover

b. Appendix B - Emergency Identification Subplan (1984, revised 1985)

c. Appendix C - Emergency Operations and Repair Subplan (1984, revised 1985)

d. Appendix D - Notification Subplan (1985, revised 1985)

This plan, however, does not include the Evacuation Subplan, which must be developed by non-Federal interests, including but not limited to New York State, Livingston County, and Monroe County, as a complement to the above appendices prepared by the Corps of Engineers (Buffalo District).

2. AUTHORITY

2.1 Flood Emergency Plans.

The Director of Civil Works, Office of the Chief of Engineers (DAEN-CWE) transmitted a directive to division offices in the 20 March 1978 letter 1/, which allowed Corps offices to proceed with evacuation plan development. This letter also provided guidance for Federal cooperation with states which were concerned about safety of Corps dams. ER 1130-2-419 2/ specified the responsibilities for management of dam operations, directs training in emergency operations, requires preparation of dam safety plans, and permits Corps technical assistance for development of evacuation plans by non-Federal interests.

1/ See Paragraph 9. REFERENCES

2.2 Federal Guidelines for Dam Safety.

The 25 June 1979 Federal Guidelines 3/ responded to President Carter's 23 April 1977 request for safety guidelines 4/. The Director of Civil Works, Office of the Chief of Engineers (DAEN-CWR-P) transmitted a policy summary to division offices in the 30 November 1979 letter 5/ which dealt with Corps emergency planning for areas downstream of Corps dams. The summary expanded consideration to include flooding without dam failure, and provided for assistance to non-Federal interests upon request. It also assigned the Hydrologic Engineering Center responsibility for preparing a technical manual 6/ on emergency planning for use by Corps personnel and as a source of information for non-Federal interests and other Federal agencies.

3. DEFINITIONS

Within the various appendices, there are important terms pertinent to this flood emergency plan. They include:

3.1 Flood Warning Condition.

A situation in which downstream flooding, influenced by releases at the dam, is likely and the loading conditions at the dam are within acceptable limits. No unusual or significant hazard to life or property is expected from the flooding.

3.2 Emergency Condition.

A situation in which the loading conditions at the dam meet or exceed predetermined safe limits. Significant hazard to life or property is possible or certain to occur. Conditions justifying declaration of an "emergency condition" may be imminent or longer term.

3.3 Dam Foreman.

The individual in charge at the Mt. Morris Dam site is called the Dam Foreman. He may also be referred to as the Dam Tender (used in both the Reservoir Regulation Manual 7/ and the Operations and Maintenance Manual 8/) or Maintenance Worker Foreman (Personnel Office's position title).

3.4 District.

Depending upon which is appropriate for the current situation, the District may be one or more of the offices, from the normal Buffalo District organization, which are responsible for implementing any or all of the subplans.

3.5 Spillway Design Discharge with Dam Failure.

An assumed emergency condition, caused by a wide breach in the dam, when monolith sections are forced apart by escaping water in about 0.1 hour, while the reservoir water surface is at an elevation of 793.3 feet with the corresponding peak outflow of 1,850,000 cfs.

3.6 Dam Failure at Full Flood Control Pool.

An assumed emergency condition, caused by a wide breach in the dam, when monolith sections are forced apart by escaping water in about 0.1 hour, while the reservoir water surface is at the spillway crest elevation of 760.0 feet with the corresponding peak outflow of 1,090,000 cfs.

3.7 Spillway Design Discharge Without Dam Failure.

An extensive downstream flooding condition, caused by the reservoir water surface reaching an elevation of 793.8 feet, with the corresponding peak outflow of 442,000 cfs.

3.8 Emergency Identification Subplan.

The Flood Emergency Plan subplan which describes procedures and means for assuring reliable identification and evaluation of potential, impending, and existing emergency situations affecting the operation and safety of Mt. Morris Dam.

3.9 Emergency Operations and Repair Subplan.

The Flood Emergency Plan subplan which establishes procedures for emergency operations and consideration of needed repairs to deal with potential, impending, and existing emergency situations affecting the operation and safety of Mt. Morris Dam.

3.10 Notification Subplan.

The Flood Emergency Plan subplan which describes the procedures and means for prompt notification of appropriate parties concerning potential, impending, and existing emergency situations at Mt. Morris Dam.

3.11 Evacuation Subplan.

The Flood Emergency Plan subplan, prepared by non-Federal officials, which describes traffic control arrangements, provides for any assistance to evacuees, describes actions to be taken to reduce damages and other losses, and arranges other aspects as required for the case at hand.

4. DESCRIPTION OF WATERSHED AND PROJECT

4.1 Description of Genesee River Basin.

Genesee River rises in the Allegheny Mountains, in Potter County, PA, and flows generally north for about 157 river miles to empty into Lake Ontario at Rochester Harbor, NY. The basin is about 100 miles long and has a maximum width of about 40 miles, as shown on Plate 1. The total basin area is 2,466 square miles, of which 1,075 square miles are above the dam. The largest tributary of the Genesee River is Canaseraga Creek, with a drainage area of 335 square miles. It joins the main stem about 4 miles below the dam site. The topography of the southern portion of the basin, above the dam, is steep

and rugged, while the lower portion of the basin is gently rolling. The river drops from about elevation 1,080 feet to 768 feet over the three Portage Falls in Letchworth Park at the head of the reservoir area, flowing through deep gorges cut in the Portage formations. It then flows through narrow valleys and gorges to enter the broad lower Genesee Valley at Mt. Morris. From this point to Rochester, and along Canaseraga Creek below Groveland Station, the valleys are flat alluvial plains up to 3 miles in width and formerly subject to frequent flooding. At Rochester, the river drops over three falls from elevation 481 to 249 fet and then empties into Lake Ontario. Numerous stream and lake stage gages are located throughout the basin and are shown on Plate 2.

4.2 Description of Mt. Morris Dam.

Authorized in 1944, completed in 1951, and first used for flood regulation on November 24, 1951, Mt. Morris Dam is located approximately 67 river miles above the mouth of the Genesee River in Livingston County, NY, and about 4 miles west of the village of Mt. Morris, and is shown on Plate 1. Mt. Morris Dam is a concrete gravity dam whose primary purpose is reduction of flood damage in the lower Genesee River. The overall length of the dam is 1,028 feet, with a top width of 20 feet, bottom width of 212.8 feet, and maximum height above the streambed of 215 feet. The uncontrolled ogee overflow spillway, 550 feet long, is located in the center of the dam with a crest elevation of 760 feet. Nine rectangular outlet conduits, each with a 5-foot X 7-foot minimum cross section, are located at the base of the spillway section. A concrete stilling basin containing two rows of baffle blocks near the downstream end serves both the spillway discharge and the outlet conduits. The cross sectional shape is roughly trapezoidal with partially stepped sides. Further description of the project may be found in the Reservoir Regulation Manual [7]. The plan, elevation, and typical sections of the dam are presented on Plates 3 and 4.

4.3 Description of Mt. Morris Reservoir.

Mt. Morris Reservoir is contained entirely in the deep and narrow valley of the Genesee River between Mt. Morris and the lower Portage Falls. Below the falls, the river flows through a constricted valley for 1.5 miles, thence through a narrow canyon over 500 feet deep and 3 miles long known as the Portage High Banks. The next 5 miles is through the narrow St. Helena Valley and thence through another gorge section, known as Mt. Morris Canyon, for 7 miles to the dam. At the top of flood control pool, elevation 760 feet, the reservoir has a total length of about 17 miles and a maximum width of about 1/2-mile. The total storage at top of flood control pool is 337,400 acre-feet, of which 610 acre-feet is dead storage. The area at full pool is 3,300 acres. The reservoir area is rugged and undeveloped, and about 50 percent wooded.

5. POTENTIALLY AFFECTED AREAS

5.1 Summary.

Emergencies at Mount Morris Dam could create hazards to life and property

on nonproject lands, including those along the (a) Genesee River below the dam in the village of Mount Morris and towns of Mount Morris and Leicester in Livingston County; (b) Canaseraga Creek in the towns of Mount Morris, Groveland, West Sparta, and Sparta in Livingston County; and (c) Genesee River below Canaseraga Creek in the Livingston County village of Avon and towns of Leicester, Geneseo, York, Avon, and Caledonia, and in the Monroe County towns of Rush, Wheatland, Henrietta, Chili, Brighton, Gates, Greece, and Irondequoit, village of Scottsville, and city of Rochester. The flooded areas and affected streams in these communities are summarized below.

General Area	Affected Communities	Affected Streams
Genesee River Below Dam (Livingston County)	Mt. Morris (Town) Mt. Morris (Village) Leicester (Town)	Genesee River
Canaseraga Creek Area (Livingston County)	Mt. Morris (Town) Mt. Morris (Village) Groveland (Town) West Sparta (Town) Sparta (Town)	Canaseraga Creek Keshequa Creek Bradner Creek Buck Run Creek Canaseraga Canal Two Mile Creek State Ditch
Genesee River Below Canaseraga Creek (Livingston County)	Leicester (Town) Geneseo (Town) York (Town) Avon (Village) Avon (Town) Caledonia (Town)	Genesee River Beards Creek Conesus Creek Christie Creek Jaycox Creek Dugan Creek White Creek Salt Creek
Genesee River Below Canaseraga Creek (Monroe County)	Rush (Town) Wheatland (Town) Scottsville (Village) Henrietta (Town) Chili (Town) Brighton (Town) Gates (Town)* Greece (Town)* Irondequoit (Town)* Rochester (City)*	Genesee River Honeoye Creek Oatka Creek Little Black Creek Black Creek Red Creek Erie (NYS Barge) Canal* Irondequoit Creek*

*Includes overland flooding outside of Genesee River Basin.

5.2 Genesee River Below Dam.

The flood plain immediately below the dam (north of Route 408 and to River Mile 62) is mainly used for farming. The eastern portion of the village of Mount Morris is affected. Affected industrial/commercial facili-

ties include the Rochester Gas and Electric (RG&E) Company hydropower plant at Route 36, Conrail tracks and bridges, and the Curtice-Burns food processing plant.

5.3 Canaseraga Creek Area.

The flood plain (south of Route 408) is mainly farmland. The eastern portion of the village of Mount Morris is affected. Affected industrial/commercial facilities include Conrail track and bridges, and the sewage disposal plant at Sonyea.

5.4 Genesee River Below Canaseraga Creek (Livingston County).

The flood plain (River Mile 62 to about River Mile 25) is mainly farmland. Affected industrial/commercial facilities include Conrail tracks and bridges and the Lucidol plant at Piffard in town of York. The Avon Springs Downs track at the village of Avon is also affected.

5.5 Genesee River Below Canaseraga Creek (Monroe County).

The flood plain (River Mile 32 to Lake Ontario) lies in two distinct areas. The southern area is farmland continued from Livingston County. The northern area is the metropolitan area and suburbs of the city of Rochester. Affected industrial/commercial facilities include Conrail tracks and bridges, RG&E substations in Henrietta and Brighton. Public facilities, such as the Rochester Institute of Technology, Interstate 90, Rochester-Monroe County Airport, and the Erie (State Barge) Canal are also affected. Overland flooding occurs through the Erie Canal into the town of Brighton east of the river, and into the towns of Gates and Greece and city of Rochester west of the river. Overland flooding also occurs through the Genesee River near the Interstate 490 Inner Loop into southern Rochester to the town of Irondequoit.

6. POTENTIAL CAUSES OF AN EMERGENCY

The potential causes of an emergency affecting the operation or safety of Mount Morris Dam are described in the following subparagraphs.

6.1 Severe Storm.

An extreme severe storm, up to the Probable Maximum Precipitation (PMP) determined in Appendix A, could occur in the area of the reservoir or over the watershed upstream from the dam, and result in large inflows to the reservoir. These inflows would cause high reservoir levels with the possibility of large discharges through the outlet conduits (up to 23,770 cfs) and large discharges over the spillway (up to Spillway Design Flood).

6.2 High Reservoir Levels.

High reservoir levels result in high hydrostatic loading on the dam. Conditions leading to a dam failure consist of the high hydrostatic loading, while accompanied by excessive seepage, increased uplift pressure, abnormal monolith movement, and cracking.

6.3 Sabotage.

Threatened or actual sabotage, which disrupts communications, disables the gate system, or breaches the dam, affects the operation of the dam. Explosive breaching would cause sudden release of a large volume of water.

7. HYDROLOGY AND HYDRAULICS

7.1 Appendix A.

Appendix A presents the hydrologic and hydraulic investigations of spillway adequacy and potential hazards of spillway discharge. Outflow hydrographs were computed for three hypothetical conditions, which were studied in accordance with "Flood Emergency Plans"[6]: probable maximum flood (PMF) without dam failure, PMF with dam failure, and dam failure at full pool. The term "PMF" used in Appendix A is equivalent to the term "spillway design flood" (SDF) mentioned in "Flood Emergency Plans"[6] and elsewhere in this report. The three conditions encompass the types of situations potentially resulting from the causes of failure mentioned in Paragraph 6 above.

7.1.1 PMF Without Dam Failure.

The PMF without dam failure has been presented in Section A3 of Appendix A. To evaluate the PMF without dam failure, and to assure that the downstream risk with the dam did not exceed the risk without the dam, both the "PMF with dam" and "PMF without dam" were modelled. Results showed that both are essentially the same, and that the presence of the dam did not increase flood conditions downstream.

7.1.2 Dam Failure Analysis

Both the PMF with dam failure and dam failure at full pool have been presented in Section A4 of Appendix A. The dam failure analysis was accomplished utilizing the National Weather Service (NWS) Dam Break Program, DAMBRK [9]. The model consisted of three parts-description of the breach, computation of the outflow hydragraph, and routing of the outflow hydrograph downstream.

7.2 Computation of Outflow Hydrographs

7.2.1 Principal Parameters

The following listing summarizes the principal parameters for the three conditions.

Parameter	PMF Without Dam Failure	PMF With Dam Failure	Dam Failure at Full Pool
Initial Pool Elevation, feet	760		
Inflow Hydrograph	PMF		Approximately 5 Percent PMF
Breach Type	N.A.	Monolith Movement	
Maximum Pool Elevation, feet	793.8	793.3	760
Maximum Release Rate, cfs	442,000	1,850,000	1,090,000
Ultimate Breach Bottom Width, feet	N.A.	(3 Monoliths @ 50 Feet) 150	
Ultimate Breach Bottom Elevation, feet	N.A.	580	
Breach Side Slope, xH:1V	N.A.	(Rectangular) 0	
Time to Develop Breach, hour	N.A.	0.1	

N.A. = not applicable

7.2.2 Outflow Hydrographs

The outflow hydrographs for Mt. Morris Dam, which were computed for the three conditions, are shown on Plates 5, 6, and 7.

7.2.3 Maximum Pool Elevations

The maximum pool elevations, also shown on the Paragraph 7.2.1 listing, include elevation 793.8 for the PMF without dam failure, 793.3 for the PMF with dam failure, and 760 for dam failure at full pool.

7.3 Routing of Outflow Hydrographs

Each outflow hydrograph was routed downstream from the dam to Rochester.

7.3.1 Flood Elevations and Times of Occurrence

Table A4.2 of Appendix A presents the maximum elevations, times of occurrence, as well as the maximum velocities and maximum discharges at spe-

cific locations, downstream from the dam, for the three conditions. The following listing summarizes only the maximum elevations and times of occurrence at the same specific locations downstream from the dam for the three conditions.

Distance Below Dam, Mile (River Mile)*	PMF Without Dam Failure		PMF With Dam Failure		Dam Failure at Full Pool	
	Maximum El., ft.	Time, hour	Maximum El., ft.	Time, hour	Maximum El., ft.	Time, hour
0.0 (66.9)	793.8	0.0	793.3	0.0	760.0	0.0
1.4 (65.5)	602.7	0.5	623.4	0.5	615.2	0.5
2.6 (64.3)	582.0	6.5	593.0	5.5	578.0	3.0
5.7 (61.2)	581.5	6.5	592.6	5.5	576.3	5.5
16.7 (50.2)	580.0	7.0	591.2	6.0	574.6	6.3
31.7 (35.2)	558.5	12.0	565.8	11.0	550.1	11.5
43.3 (23.6)	554.8	14.0	561.2	13.5	546.6	14.4
45.8 (21.1)	553.5	14.5	559.6	14.0	545.3	15.0
52.6 (14.3)	547.8	18.0	552.2	17.5	537.1	22.0
55.1 (11.8)	544.3	19.0	549.1	18.0	535.3	23.0
55.6 (11.3)	543.1	19.0	547.6	18.0	534.5	23.0
57.0 (9.9)	534.8	19.5	538.3	18.0	527.9	23.4
58.8 (8.1)	523.6	20.0	527.1	18.5	519.0	24.0
59.5 (7.4)	503.2	20.0	507.0	18.5	494.4	24.0
60.8 (6.1)	280.6	20.0	286.4	18.5	271.5	24.0

* (River Mile) - Distance along stream channel from mouth in Miles. Mt. Morris Dam is located at River Mile 66.9.

7.3.2 Discharge and Stage Hydrographs

For selected downstream locations (River Mile 61.2, 35.2, 14.3 and 6.1), Plates 8 to 10 present the discharge hydrogarphs for the three conditions. For the above locations and additional downstream locations (River Mile 65.5, 50.2, 23.6, 21.1, 11.8, 11.3, 9.9, 8.1, and 7.4), Plates 11 to 23 present the stage hydrographs for the three conditions.

7.3.3 Profiles

Plates 24 to 26 present the profiles for the conditions of "PMF with Dam Failure" and "PMF without Dam Failure." The profile for "Dam Failure at Full Pool" is not shown because the flood elevation is basically lower than the other two.

7.3.4 Occurrence of Hazardous Conditions

Hazardous conditions are defined as those in which:

a. Flood depths are greater than two feet,
b. Velocities exceed four feet per second, and
c. Flood depths are sufficient to damage property.

The following listing provides the computation of the lowest hazardous elevations at selected locations, the Index Points for Reaches 2, 3, and 4 shown on Plates 24 and 25.

Location Index Point	Distance Below Dam, Miles (River Mile)	Max. Vel. (FPS) *	25% Max. Vel. (FPS) *	Low Bank El (Ft)	Low Bank + 2' (Ft)	Damage Elev. (Ft.)	Low Hazard El (Ft.) **
PMF Without Dam Failure:							
4	26.3 (40.6)	2.6	0.6	552	554	560	554
3	40.3 (26.6)	3.4	0.8	526	528	529	528
2	52.9 (14.0)	3.1	0.8	515	517	516	516
PMF With Dam Failure:							
4	26.3 (40.6)	3.1	0.8	552	554	560	554
3	40.3 (26.6)	4.0	1.0	526	528	529	528
2	52.9 (14.0)	3.2	0.8	515	517	516	516
Dam Failure @ Full Pool							
4	26.3 (40.6)	4.8	1.2	552	554	560	554
3	40.3 (26.6)	3.8	0.9	526	528	529	528
2	52.9 (14.0)	2.8	0.7	515	517	516	516

* Maximum velocities approximated from velocities in MPH given in Table A4.2 of Appendix A and converted to FPS. Overbank velocity assumed at 25% of maximum velocity.

** Lowest hazardous elevation is low bank elevation plus 2 feet, or elevation at which damage occurs, whichever is lowest, since overbank velocity is less than 4 FPS.

7.4 Flooded Area Maps

Plate 27 presents the flooded area map index for Plates 28 to 33 which show the boundaries of the flooded areas affected by the hypothesized conditions of "PMF with Dam Failure" and "PMF without Dam Failure." The boundary of the flood from "Dam Failure at Full Pool" is not shown because the affected area is basically within the limits of the "Probable Maximum Flood", which is more extensive. The term "flooded area maps" used here is synonymous with the term "inundation maps" used in the "Flood Emergency Plans" 6/.

8. EVACUATION PLANNING

8.1 Evacuation Subplan.

The formulation of the non-Federal Evacuation Subplan will be based on the affected areas within the boundaries provided on Plates 28 through 33.

Safety and effective evacuation of endangered areas are particularly important within the subplan. A variety of other topics, such as warning, traffic control, and rescue will also be covered.

8.2 Jurisdictions Affected.

The jurisdictions affected are located in both Livingston and Monroe Counties, as shown on the aforementioned plates and provided in Paragraph 5 of this report. All evacuation effort will be coordinated through the respective county Office of Disaster Preparedness.

9. REFERENCES

1/ DAEN-CWE letter, dated 20 March 1978, Subject: Evacuation Plans for Areas Downstream of Corps Dams and Corps/State Cooperation on Safety Review of Corps Dams.

2/ ER 1130-2-419, dated 18 May 1978, Dam Operations Management Policy.

3/ Federal Guidelines for Dam Safety, dated 25 June 1979, prepared by the Ad Hoc Interagency Committee on Dam Safety of the Federal Coordinating Council for Science, Engineering, and Technology, Washington, DC.

4/ Memorandum for the Secretary of the Interior, et al., dated 23 April 1977.

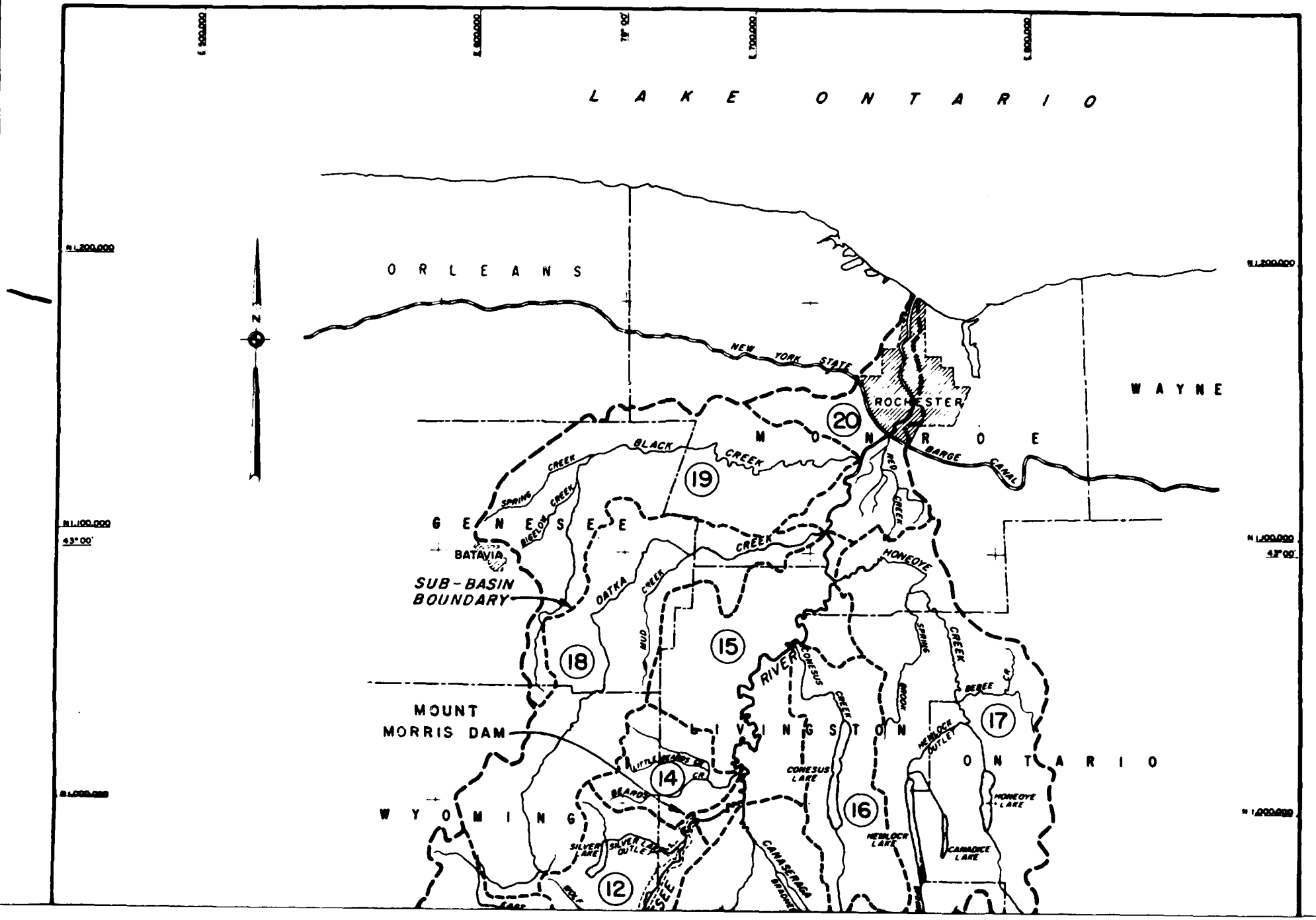
5/ DAEN-CWR-P letter, dated 30 November 1979, Subject: Policy Issue No. 79-13, Corps Role in Emergency Planning for Areas Downstream of Corps of Engineers Dams.

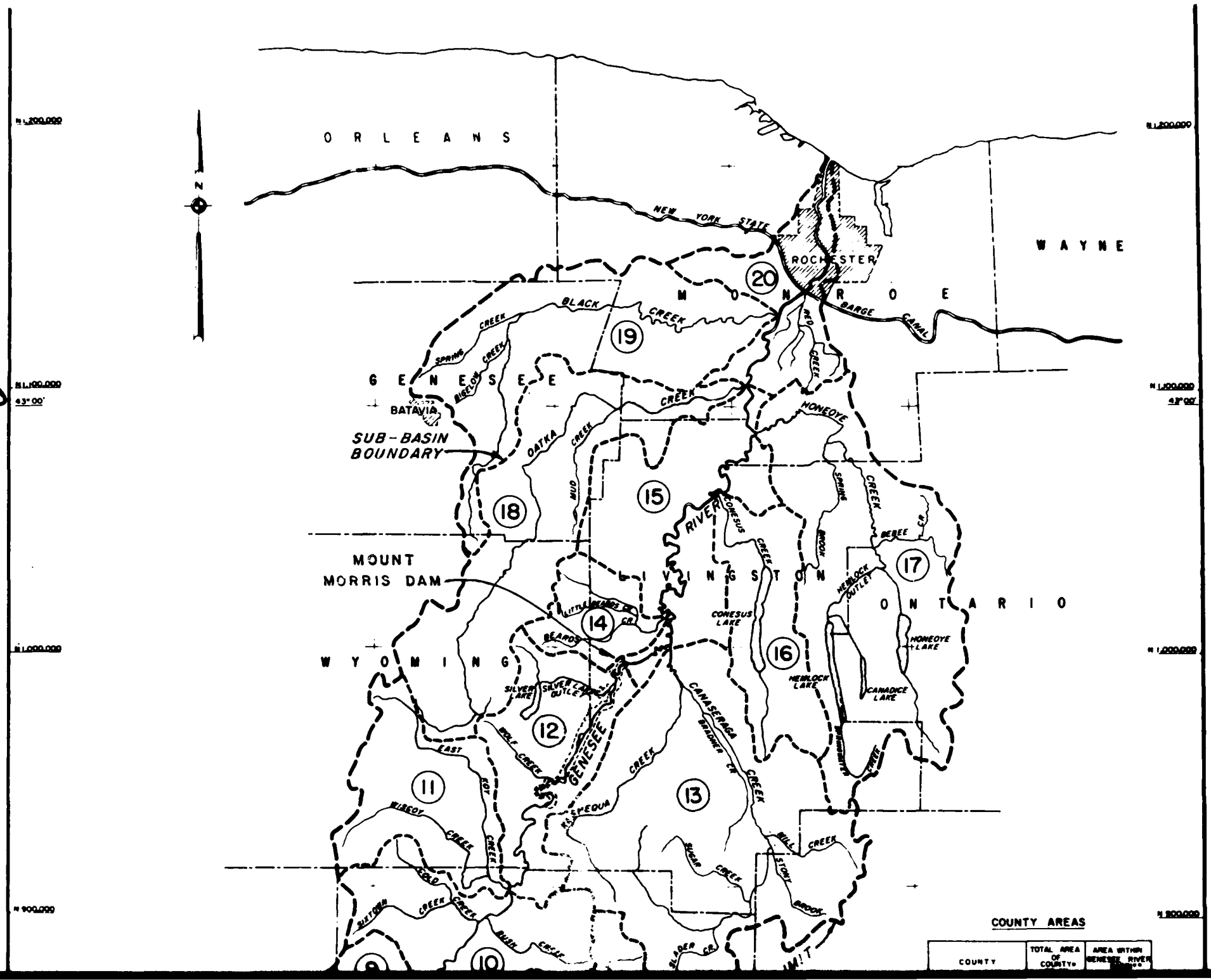
6/ Flood Emergency Plans, Guidelines for Corps Dams, dated June 1980, Hydrologic Engineering Center, Davis, CA.

7/ Reservoir Regulation Manual, Mount Morris Dam and Reservoir, U.S. Army Engineer District, Buffalo, September 1978.

8/ Mt. Morris Lake, Operations and Maintenance Manual, Corps of Engineers, Buffalo District, October 1978.

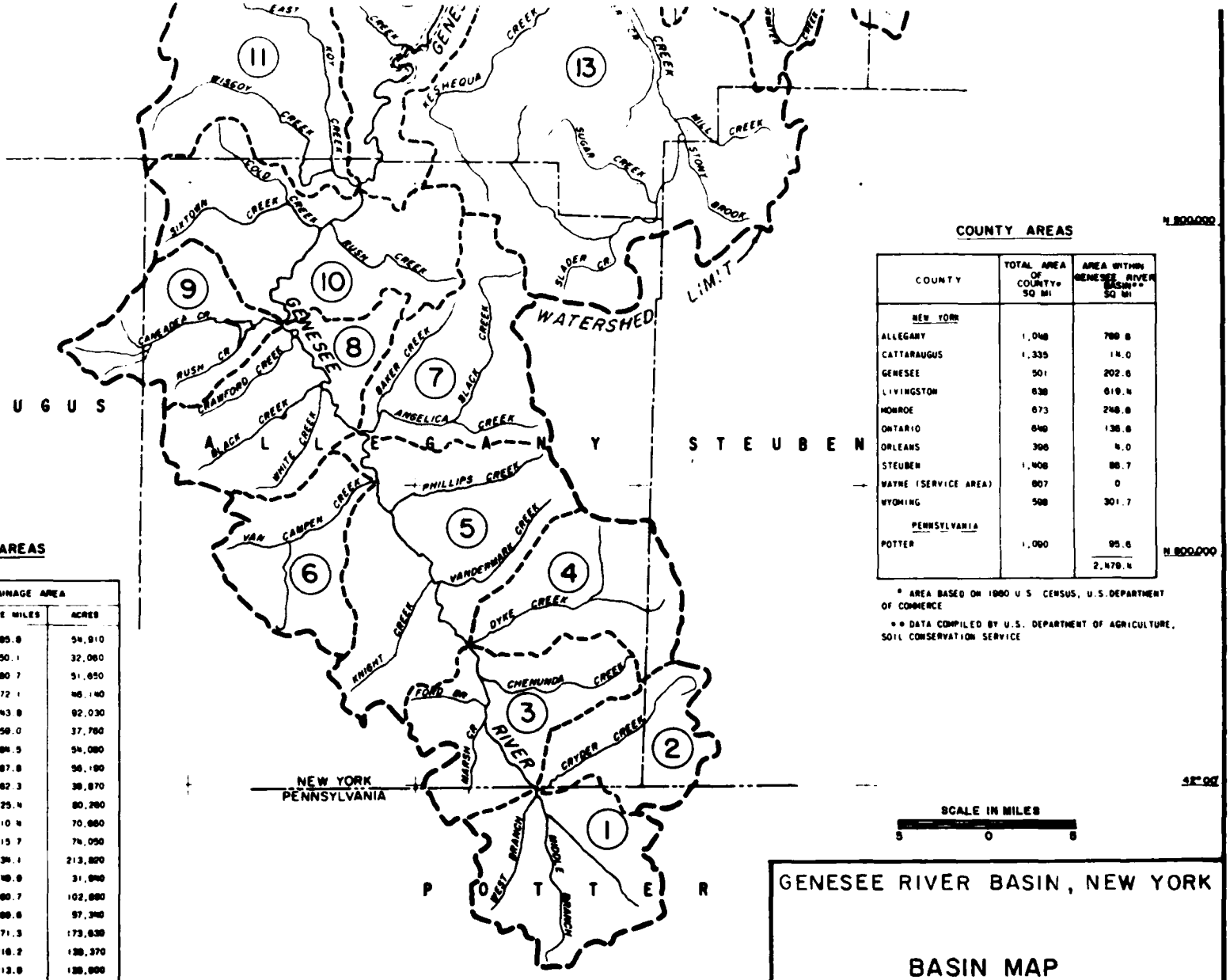
9/ DAMBRK: the NWS Dam-Break Flood Forecasting Model, Office of Hydrology, National Weather Service (NWS), Silver Spring, Maryland, 1979.


LAKE ONTARIO
ORLEANS
NEW YORK STATE
ROCHESTER
WAYNE
MONROE
BARGE CANAL
BLACK CREEK
SPRING CREEK
ALLEN CREEK
GENESEE
BATAVIA
SUB-BASIN BOUNDARY
OATKA CREEK
MUD CREEK
HONEOYE CREEK
RED CREEK
SPRING CREEK
BEBEE CR.
GENESEE RIVER
CONESUS CREEK
BROOK
LIVINGSTON
ONTARIO
MOUNT MORRIS DAM
WYOMING
LITTLE BEARD'S CR.
BEARDS CR.
CONESUS LAKE
HEMLOCK OUTLET
HONEOYE LAKE
HEMLOCK LAKE
CANADICE LAKE
SILVER LAKE
SILVER LAKE OUTLET
CANASERAGA CREEK
19
20
18
15
17
14
16
12
N 1,200,000
N 1,100,000
43° 00'



COUNTY AREAS

COUNTY	TOTAL AREA OF COUNTY	AREA WITHIN GENESEE RIVER



SUBWATERSHED AREAS

SUBWATERSHED NUMBER	SUBWATERSHED NAME	DRAINAGE AREA SQUARE MILES	DRAINAGE AREA ACRES
1	GENESEE SOUTH	85.8	54,910
2	CRYDER CREEK	50.1	32,060
3	GENESEE CHEMUNG	80.7	51,650
4	DYKE CREEK	72.1	46,140
5	GENESEE VANDERMARK	143.8	92,030
6	VAN CAMPEN CREEK	58.0	37,760
7	ANGELICA CREEK	84.5	54,080
8	GENESEE SOUTH BLACK	87.8	56,190
9	CANEADEA CREEK	62.3	38,870
10	GENESEE COLD CREEK	125.4	80,280
11	WISCOY CREEK	110.4	70,660
12	SILVER LAKE OUTLET	115.7	74,050
13	CANASERAGA CREEK	334.1	213,820
14	BEARDS CREEK	48.8	31,040
15	GENESEE - GENESEO	160.7	102,880
16	CONESUS LAKE	88.8	57,340
17	HONEOYE CREEK	271.3	173,630
18	OATKA CREEK	218.2	139,370
19	BLACK CREEK	213.8	136,800
20	GENESEE - ROCHESTER	88.1	142,300
TOTAL		2,970.4	1,888,810

DATA COMPILED BY U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE. ADDITIONAL BREAKDOWN OF DRAINAGE AREA DATA WITHIN A SUBWATERSHED AVAILABLE FROM MR. J. MITCHELL, RIVER BASIN REPRESENTATIVE, SOIL CONSERVATION SERVICE, 21 SOUTH GROVE STREET, EAST AURORA, NEW YORK.

COUNTY AREAS

COUNTY	TOTAL AREA OF COUNTY* SQ MI	AREA WITHIN GENESEE RIVER BASIN** SQ MI
NEW YORK		
ALLEGANY	1,048	788.8
CATTARAUGUS	1,335	14.0
GENESEE	501	202.6
LIVINGSTON	638	619.4
MONROE	673	248.8
ONTARIO	648	138.8
ORLEANS	396	4.0
STEUBEN	1,408	88.7
WAYNE (SERVICE AREA)	807	0
WYOMING	598	301.7
PENNSYLVANIA		
POTTER	1,090	95.6
		2,470.4

* AREA BASED ON 1960 U.S. CENSUS, U.S. DEPARTMENT OF COMMERCE

** DATA COMPILED BY U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

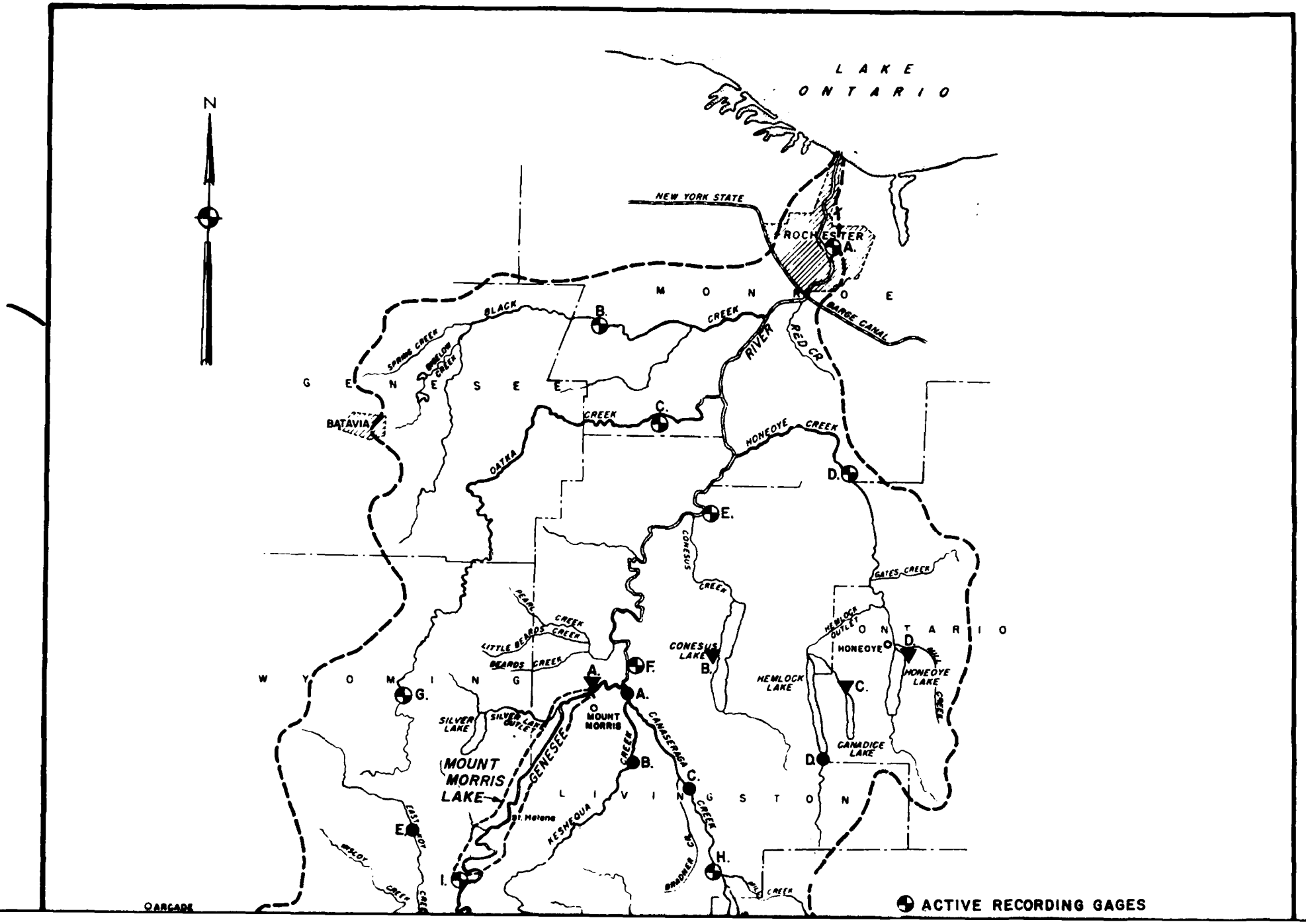
SCALE IN MILES
5 0 5

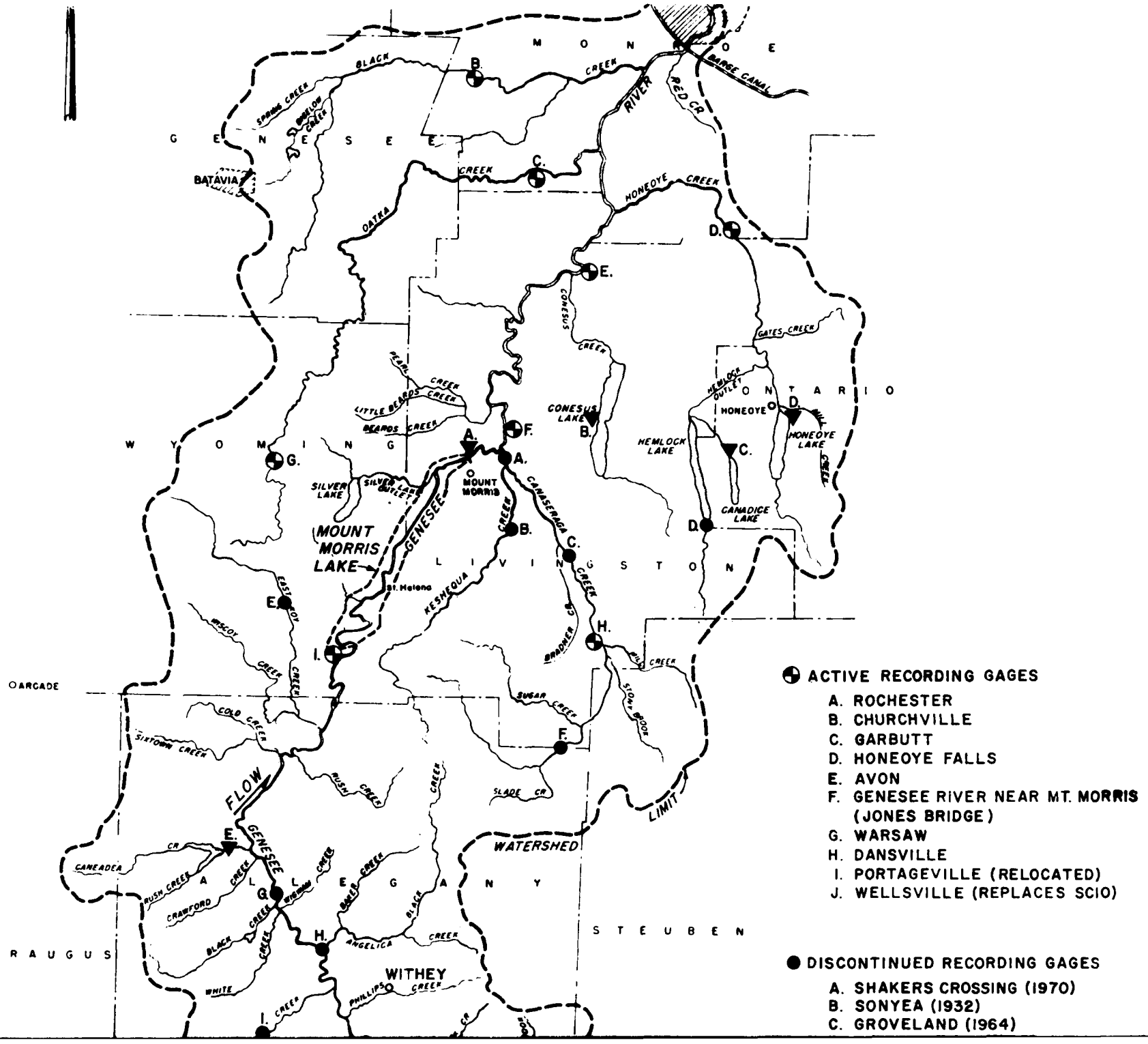
GENESEE RIVER BASIN, NEW YORK

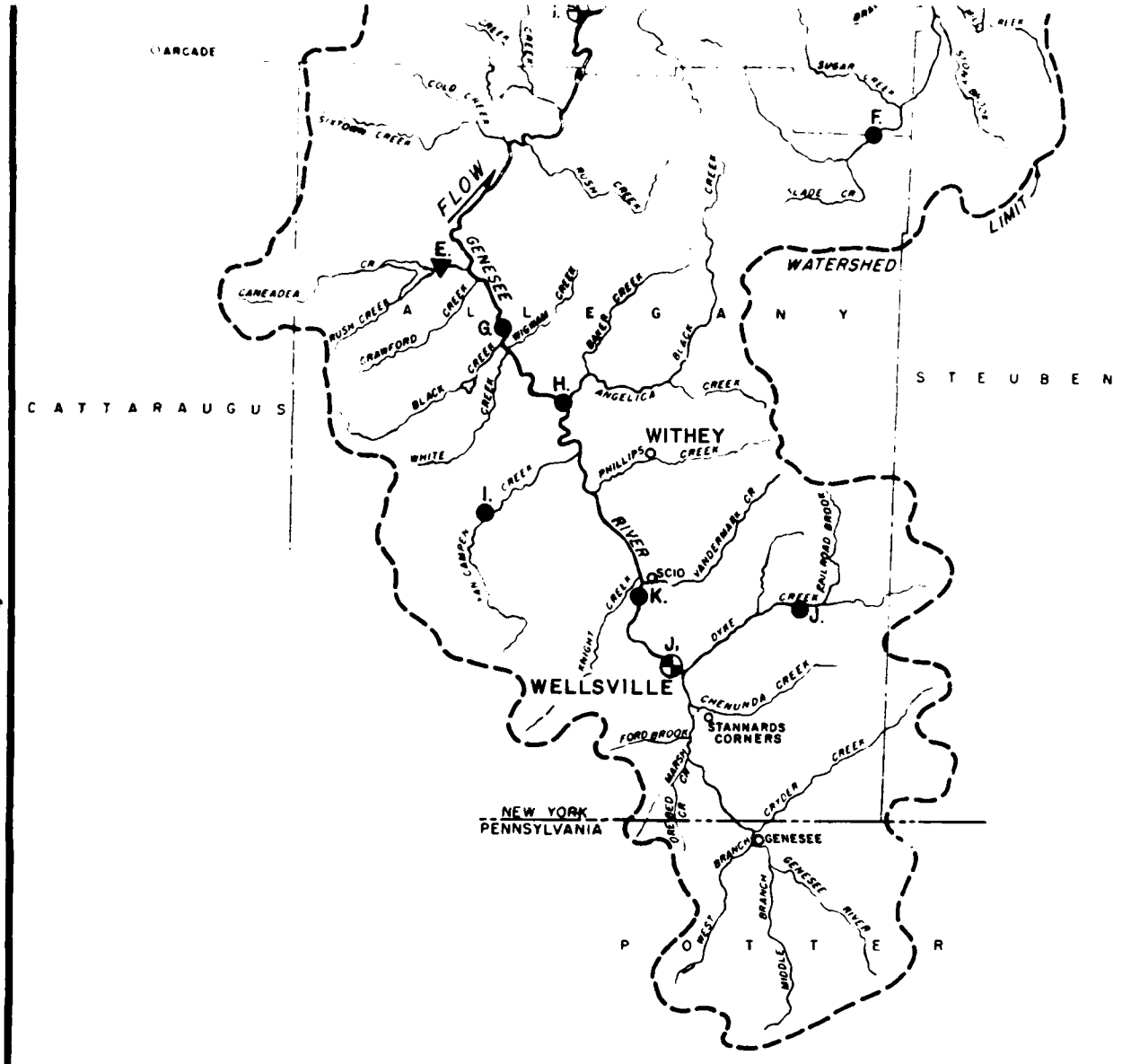
BASIN MAP

U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE 1


LAKE ONTARIO
N
NEW YORK STATE
ROCHESTER
A.
MONROE
BARGE CANAL
RED CR
RIVER
BLACK CREEK
SPRING CREEK
ALLEN CREEK
GENESEE
BATAVIA
OATKA CREEK
HONEOYE CREEK
CONESUS CREEK
GATES CREEK
HEMLOCK OUTLET
ONTARIO
HONEOYE
HONEOYE LAKE
HEMLOCK LAKE
CONESUS LAKE
CANADICE LAKE
CANASERAGA CREEK
PEARL CREEK
LITTLE BEARDS CREEK
BEARDS CREEK
WYOMING
SILVER LAKE
SILVER LAKE OUTLET
MOUNT MORRIS
MOUNT MORRIS LAKE
GENESEE
St. Helena
KESHEQUA CREEK
LIVINGSTON
BRADNER CREEK
ACTIVE RECORDING GAGES


MONROE
GENESEE
WYOMING
LIVINGSTON
ONTARIO
CATTARAUGUS
ALLEGANY
STEUBEN
ARCADE
BATAVIA
MOUNT MORRIS LAKE
MOUNT MORRIS
SILVER LAKE
CONESUS LAKE
HEMLOCK LAKE
HONEOYE
HONEOYE LAKE
CANADICE LAKE
WITHEY
St. Helena
BLACK CREEK
SPRING CREEK
OATKA CREEK
HONEOYE CREEK
RED CR.
BARGE CANAL
GENESEE RIVER
CONESUS CREEK
GATES CREEK
HEMLOCK OUTLET
PEARL CREEK
LITTLE BEARDS CREEK
BEARDS CREEK
SILVER LAKE OUTLET
CANASERAGA CREEK
KESHEQUA CREEK
EASTON BROOK
BISCOY CREEK
BRADNER CR.
SUGAR CREEK
SLOAN BROOK
MILL CREEK
COLD CREEK
SIXTOWN CREEK
RUSH CREEK
SLADE CR.
FLOW LIMIT
WATERSHED
CANEADEA CR.
CRAWFORD CREEK
WARNER CREEK
BAKER CREEK
ANGELICA CREEK
WHITE CREEK
PHILLIPS CREEK
ACTIVE RECORDING GAGES
A. ROCHESTER
B. CHURCHVILLE
C. GARBUTT
D. HONEOYE FALLS
E. AVON
F. GENESEE RIVER NEAR MT. MORRIS (JONES BRIDGE)
G. WARSAW
H. DANSVILLE
I. PORTAGEVILLE (RELOCATED)
J. WELLSVILLE (REPLACES SCIO)
DISCONTINUED RECORDING GAGES
A. SHAKERS CROSSING (1970)
B. SONYEA (1932)
C. GROVELAND (1964)



● ACTIVE RECORDING GAGES

- A. ROCHESTER
- B. CHURCHVILLE
- C. GARBUTT
- D. HONEOYE FALLS
- E. AVON
- F. GENESEE RIVER NEAR MT. MORRIS (JONES BRIDGE)
- G. WARSAW
- H. DANSVILLE
- I. PORTAGEVILLE (RELOCATED)
- J. WELLSVILLE (REPLACES SCIO)

● DISCONTINUED RECORDING GAGES

- A. SHAKERS CROSSING (1970)
- B. SONYEA (1932)
- C. GROVELAND (1964)
- D. SPRINGWATER (1968)
- E. EAST KOY (1968)
- F. CANASERAGA (1968)
- G. BELFAST (1967)
- H. ANGELICA-TRANSIT BRIDGE (1968)
- I. FRIENDSHIP (1968)
- J. ANDOVER (1968)
- K. SCIO (DESTROYED JUNE 1972)

▼ LAKE STAGE GAGES

- A MT. MORRIS LAKE
- B. CONESUS LAKE (NEAR LAKEVILLE)
- C. CANADICE LAKE
- D. HONEOYE LAKE
- E. CANEADEA DAM(REPLACES CANEADEA)

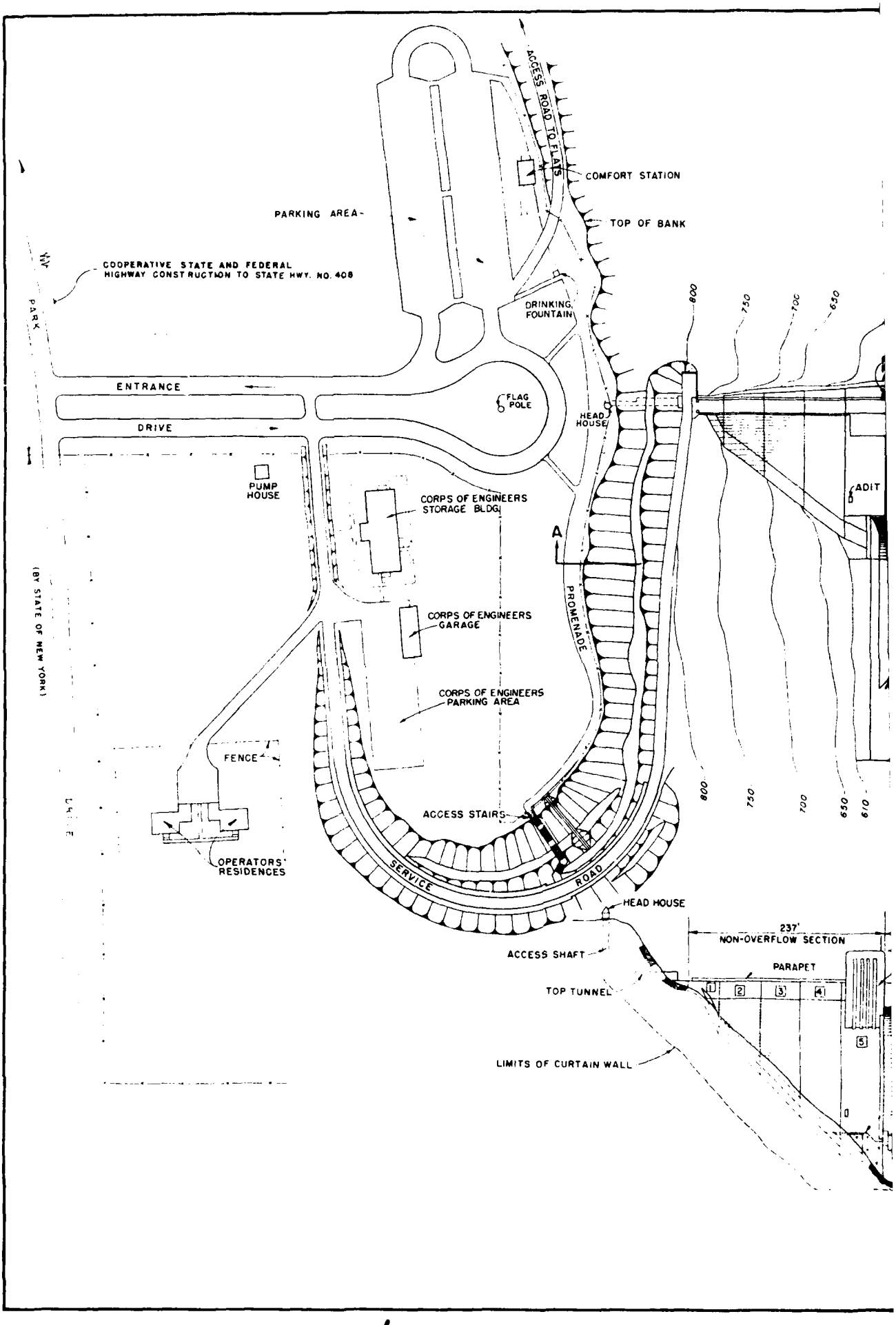
GENESEE RIVER BASIN
N. Y.

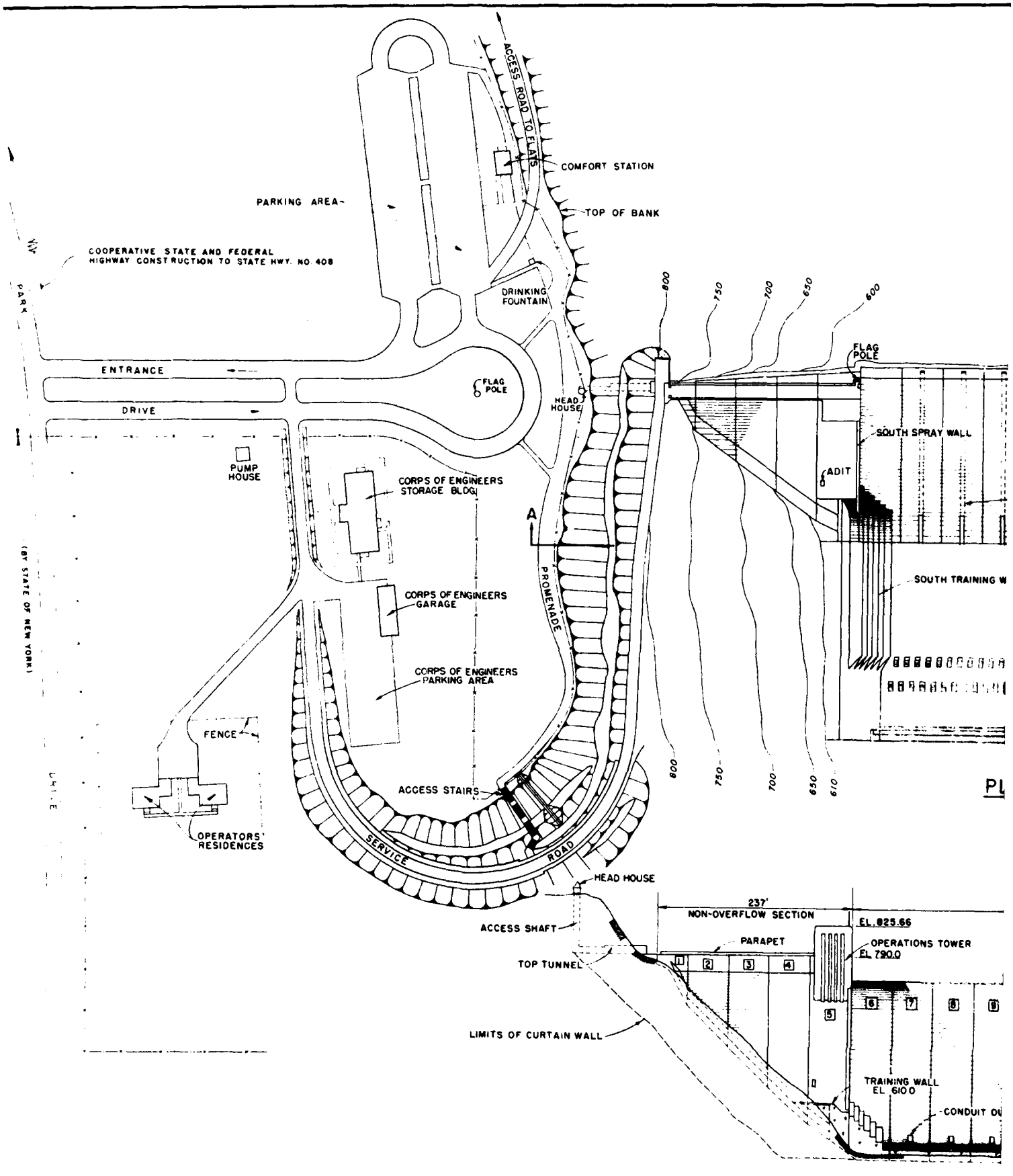
GAGE LOCATIONS

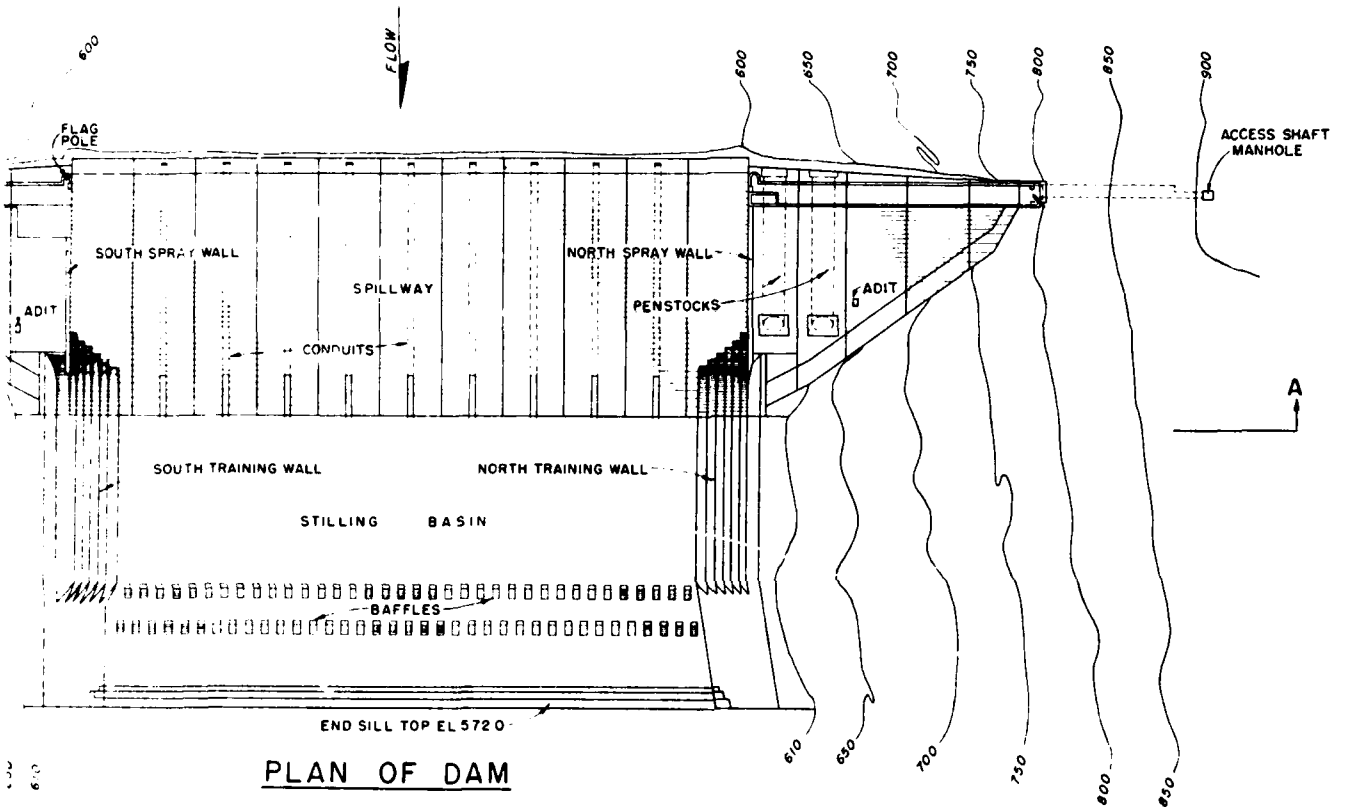
U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 2

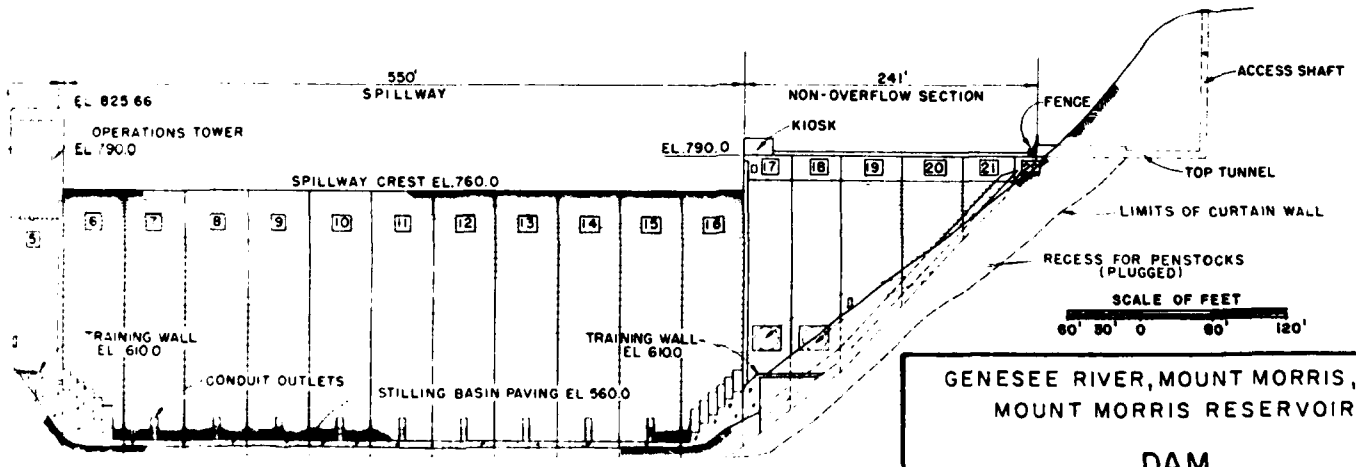
3


ACCESS ROAD TO FLATS
COMFORT STATION
PARKING AREA
TOP OF BANK
COOPERATIVE STATE AND FEDERAL HIGHWAY CONSTRUCTION TO STATE HWY. NO. 408
PARK
DRINKING FOUNTAIN
800
750
700
650
ENTRANCE
FLAG POLE
HEAD HOUSE
DRIVE
PUMP HOUSE
CORPS OF ENGINEERS STORAGE BLDG.
ADIT
A
(BY STATE OF NEW YORK)
CORPS OF ENGINEERS GARAGE
PROMENADE
CORPS OF ENGINEERS PARKING AREA
FENCE
ACCESS STAIRS
800
750
700
650
610
SERVICE ROAD
OPERATORS' RESIDENCES
HEAD HOUSE
237'
NON-OVERFLOW SECTION
ACCESS SHAFT
PARAPET
TOP TUNNEL
1
2
3
4
5
LIMITS OF CURTAIN WALL


ACCESS ROAD TO FLATS
COMFORT STATION
PARKING AREA
TOP OF BANK
COOPERATIVE STATE AND FEDERAL HIGHWAY CONSTRUCTION TO STATE HWY. NO. 408
DRINKING FOUNTAIN
ENTRANCE
DRIVE
FLAG POLE
HEAD HOUSE
PUMP HOUSE
CORPS OF ENGINEERS STORAGE BLDG.
CORPS OF ENGINEERS GARAGE
CORPS OF ENGINEERS PARKING AREA
PROMENADE
FENCE
ACCESS STAIRS
OPERATORS' RESIDENCES
SERVICE ROAD
HEAD HOUSE
ACCESS SHAFT
TOP TUNNEL
LIMITS OF CURTAIN WALL
800
750
700
650
600
610
FLAG POLE
SOUTH SPRAY WALL
ADIT
SOUTH TRAINING W
237'
NON-OVERFLOW SECTION
EL. 825.66
PARAPET
OPERATIONS TOWER
EL. 790.0
TRAINING WALL
EL. 610.0
CONDUIT OU
PL
SECTIONA



PLAN OF DAM

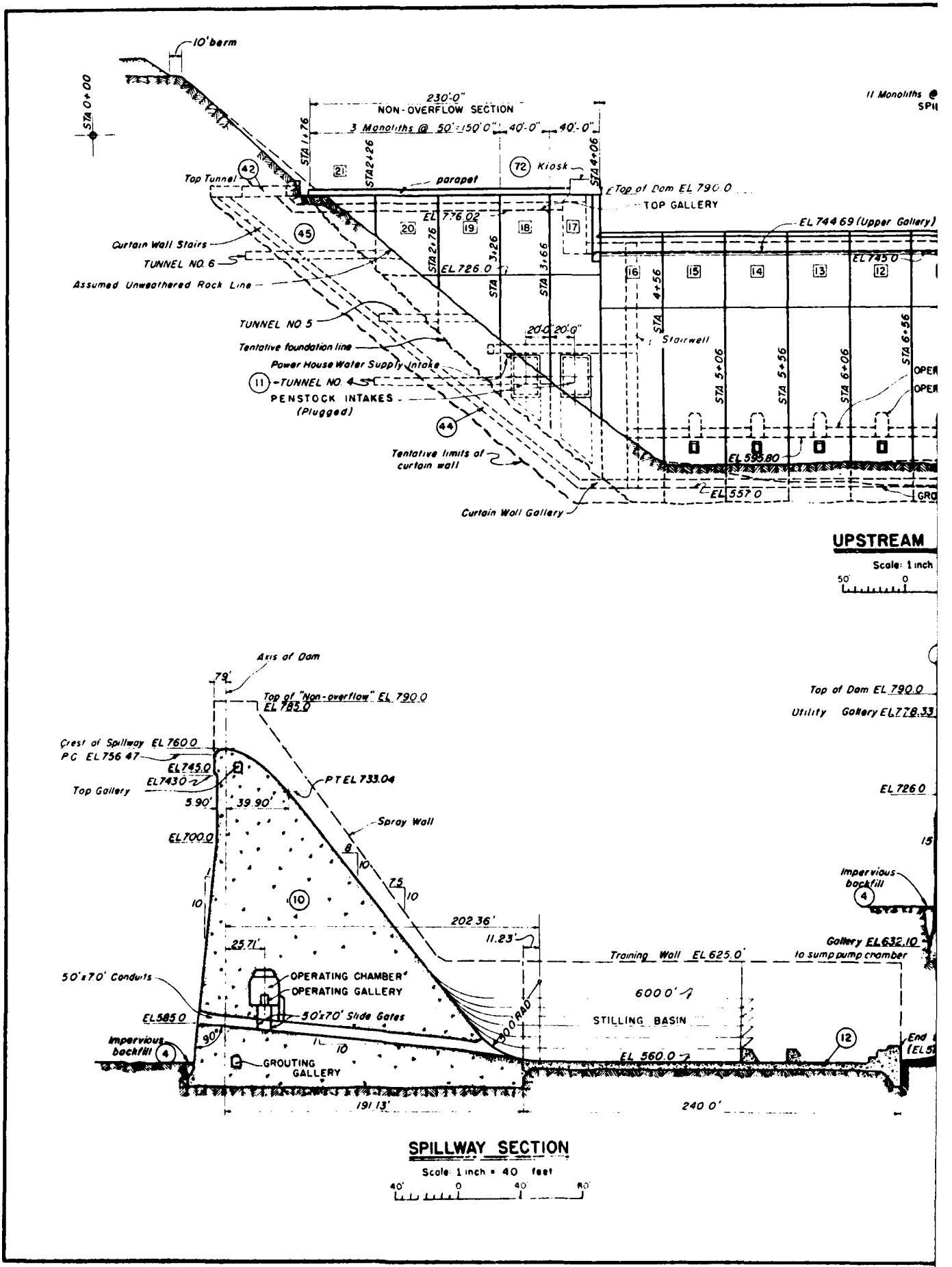


SECTIONAL ELEVATION AT A-A

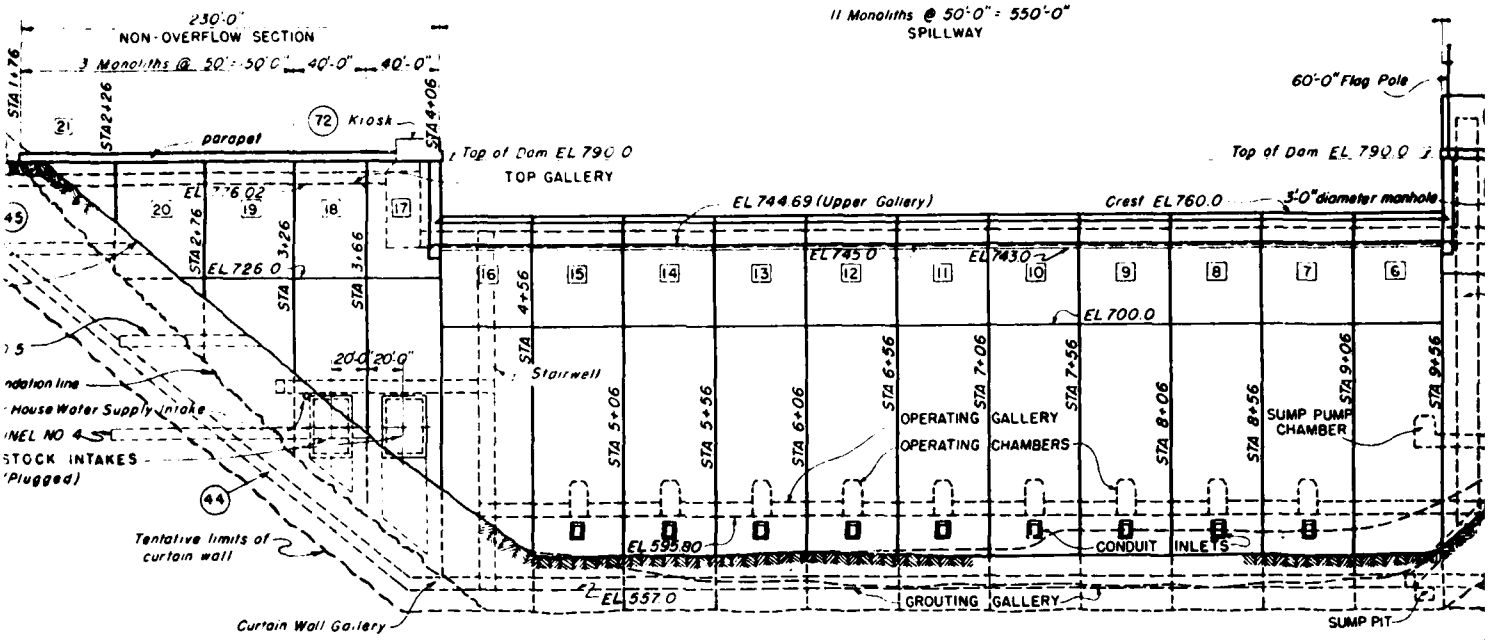
GENESEE RIVER, MOUNT MORRIS, N.Y.
MOUNT MORRIS RESERVOIR

DAM
PLAN AND ELEVATION

U.S. ARMY ENGINEER DISTRICT BUFFALO


10' berm
STA 0+00
230'-0"
NON-OVERFLOW SECTION
3 Monoliths @ 50'=150'0"
40'-0"
40'-0"
11 Monoliths @
SPI
STA 1+76
STA 2+26
STA 4+06
Top Tunnel
parapet
Kiosk
℄ Top of Dam EL 790.0
TOP GALLERY
EL 776.02
EL 744.69 (Upper Gallery)
Curtain Wall Stairs
TUNNEL NO. 6
STA 2+76
EL 726.0
STA 3+26
STA 3+66
EL 745.0
Assumed Unweathered Rock Line
STA 4+56
TUNNEL NO. 5
20'-0"
20'-0"
Stairwell
Tentative foundation line
Power House Water Supply Intake
TUNNEL NO. 4
PENSTOCK INTAKES
(Plugged)
STA 5+06
STA 5+56
STA 6+06
STA 6+56
OPER
OPER
Tentative limits of curtain wall
EL 595.80
EL 557.0
GRO
Curtain Wall Gallery
UPSTREAM
Scale: 1 inch
50' 0
Axis of Dam
79'
Top of "Non-overflow" EL 790.0
EL 785.0
Top of Dam EL 790.0
Utility Gallery EL 778.33
Crest of Spillway EL 760.0
PC EL 756.47
EL 745.0
EL 743.0
Top Gallery
5.90'
39.90'
PT EL 733.04
EL 726.0
Spray Wall
EL 700.0
Impervious backfill
202.36'
11.23'
25.71'
Gallery EL 632.10
to sump pump cromber
Training Wall EL 625.0
50'x70' Conduits
OPERATING CHAMBER
OPERATING GALLERY
600' ↗
STILLING BASIN
EL 585.0
50'x70' Slide Gates
100' RAD
Impervious backfill
GROUTING GALLERY
EL 560.0
End
(EL 5
191.13'
240.0'
SPILLWAY SECTION
Scale: 1 inch = 40 feet
40' 0 40' 80'

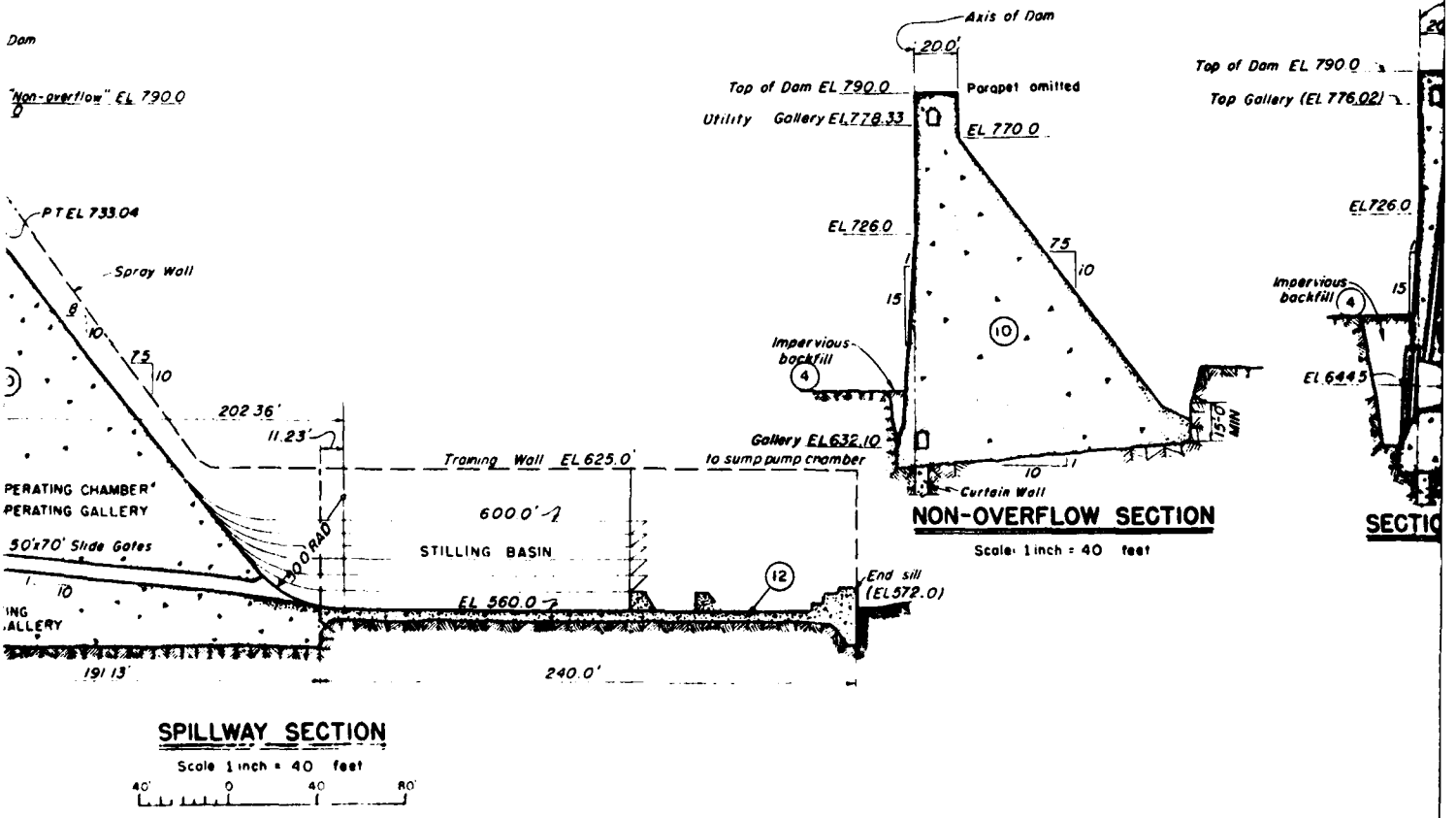
1



UPSTREAM ELEVATION

Scale: 1 inch = 50 feet

50' 0 50' 100'



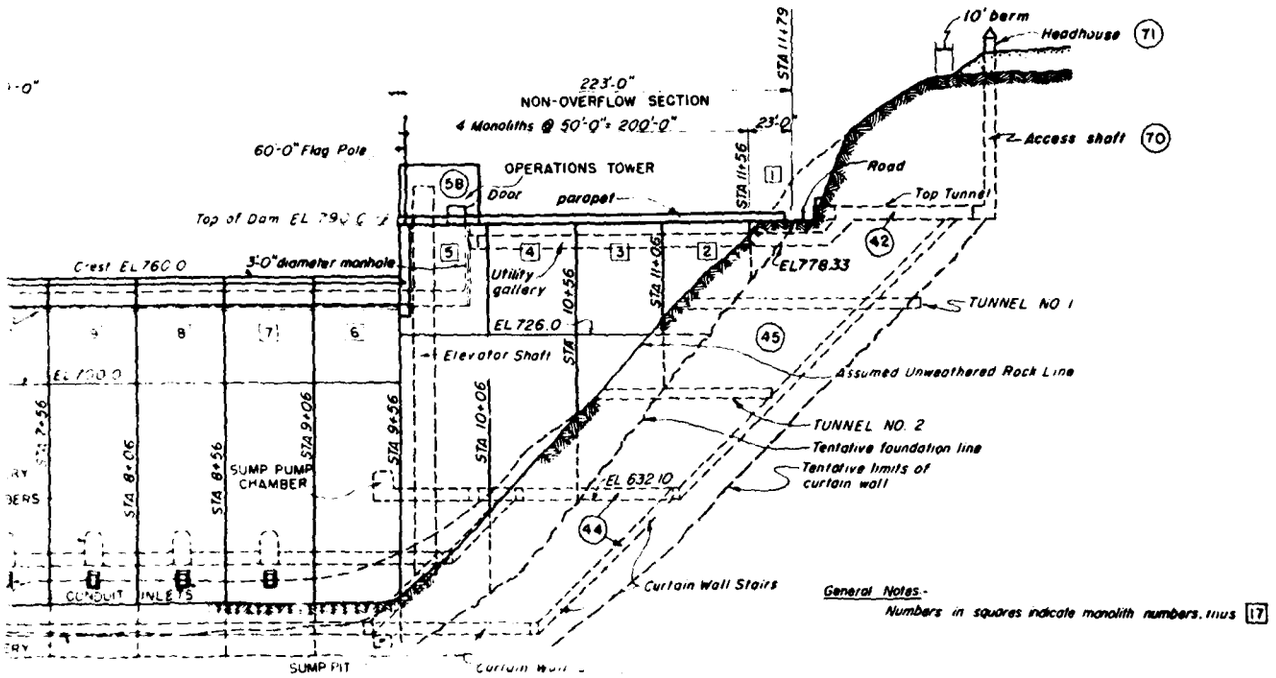
SPILLWAY SECTION

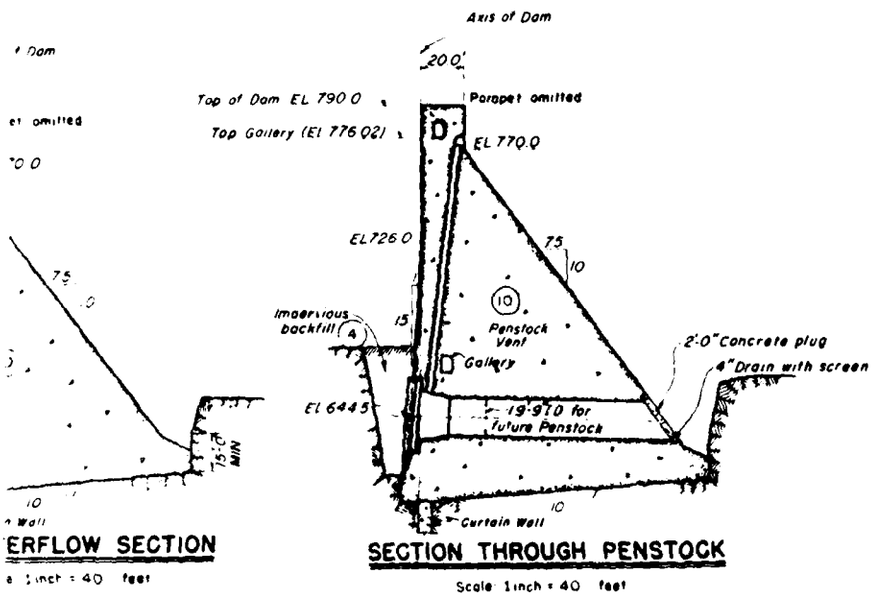
Scale 1 inch = 40 feet

40' 0 40' 80'

NON-OVERFLOW SECTION

Scale: 1 inch = 40 feet





ERFLOW SECTION

Scale: 1 inch = 40 feet

SECTION THROUGH PENSTOCK

Scale: 1 inch = 40 feet

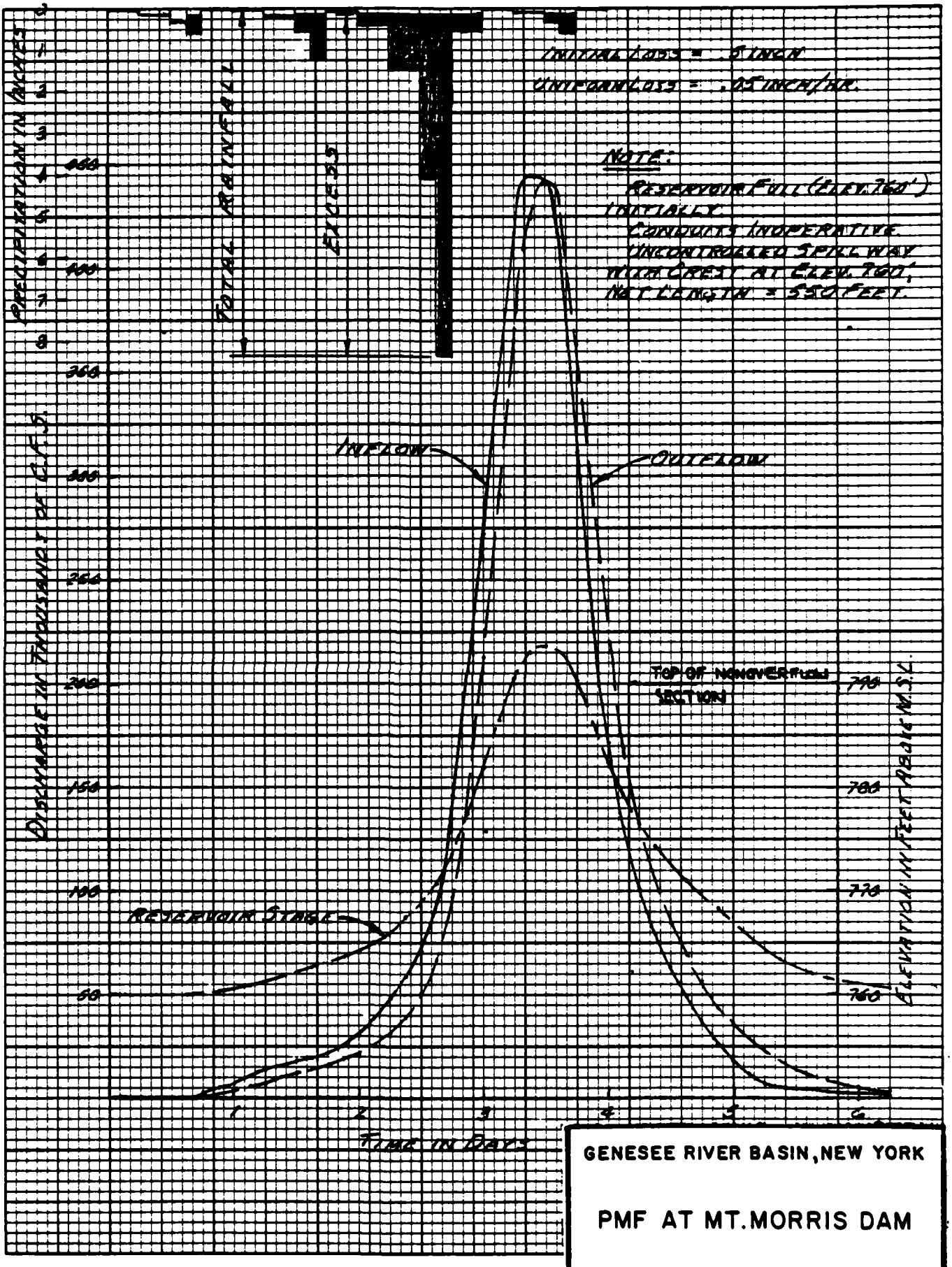
GENESEE RIVER, MOUNT MORRIS, N.Y.
MOUNT MORRIS RESERVOIR

DAM
UPSTREAM ELEVATION
AND TYPICAL SECTIONS

U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE 4

3

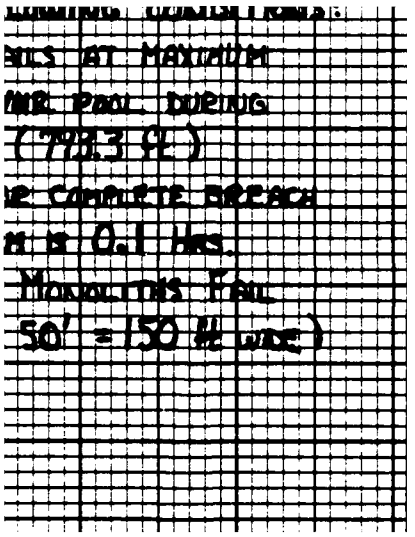


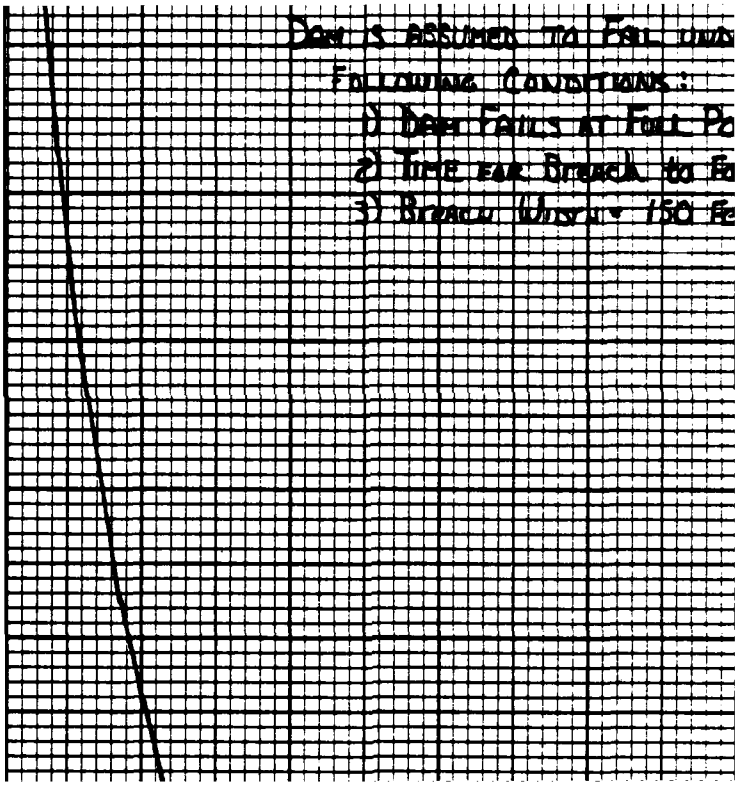
GENESEE RIVER BASIN, NEW YORK

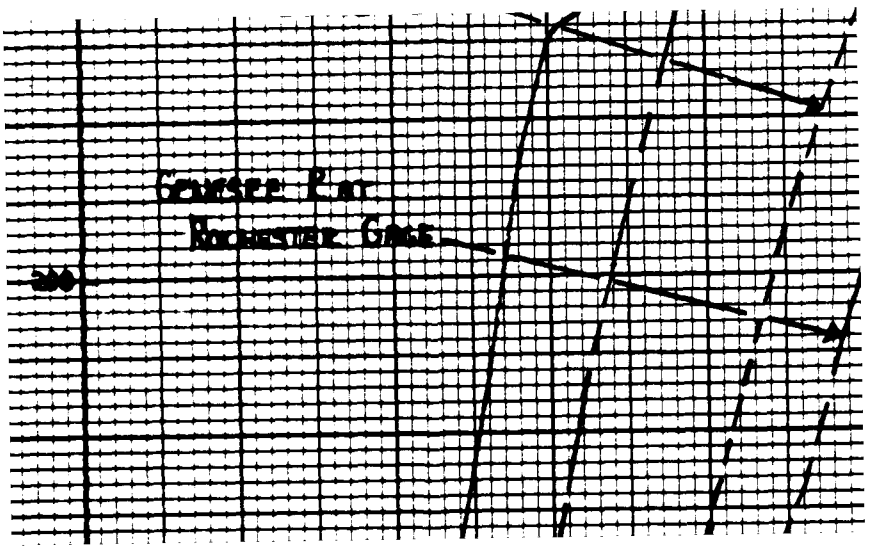
PMF AT MT. MORRIS DAM

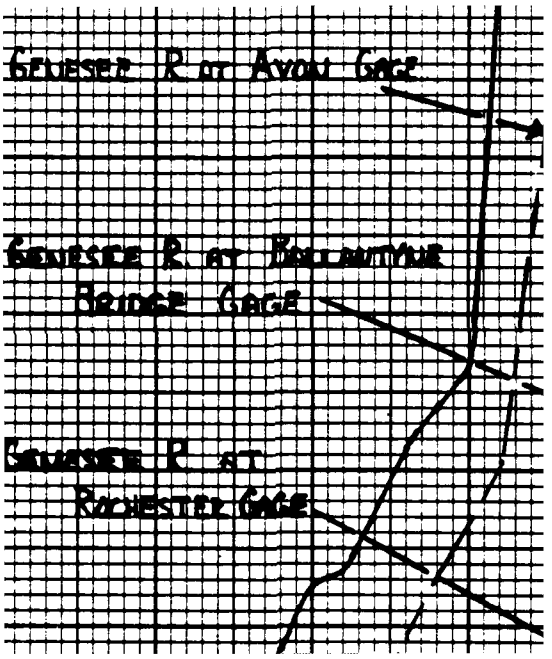
U.S. ARMY ENGINEER DISTRICT, BUFFALO

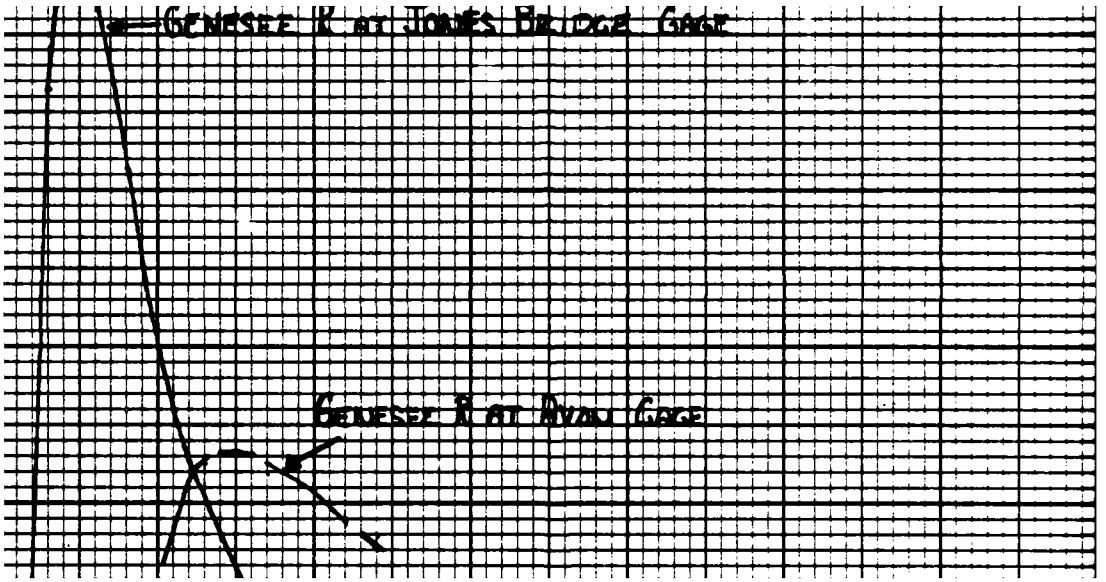
PLATE 5




DAM IS ASSUMED TO FAIL UND
FOLLOWING CONDITIONS:
1) DAM FAILS AT FULL PO
2) TIME FOR BREACH TO FA
3) BREACH WIDTH = 150 FE


Geyser Pat
Rochester Gage
300


GENESEE R. AT AVON GAGE
GENESEE R. AT ROCHESTER
BRIDGE GAGE
GENESEE R. AT
ROCHESTER GAGE


Genesee R at James Bridge Gage
Genesee R at Avon Gage

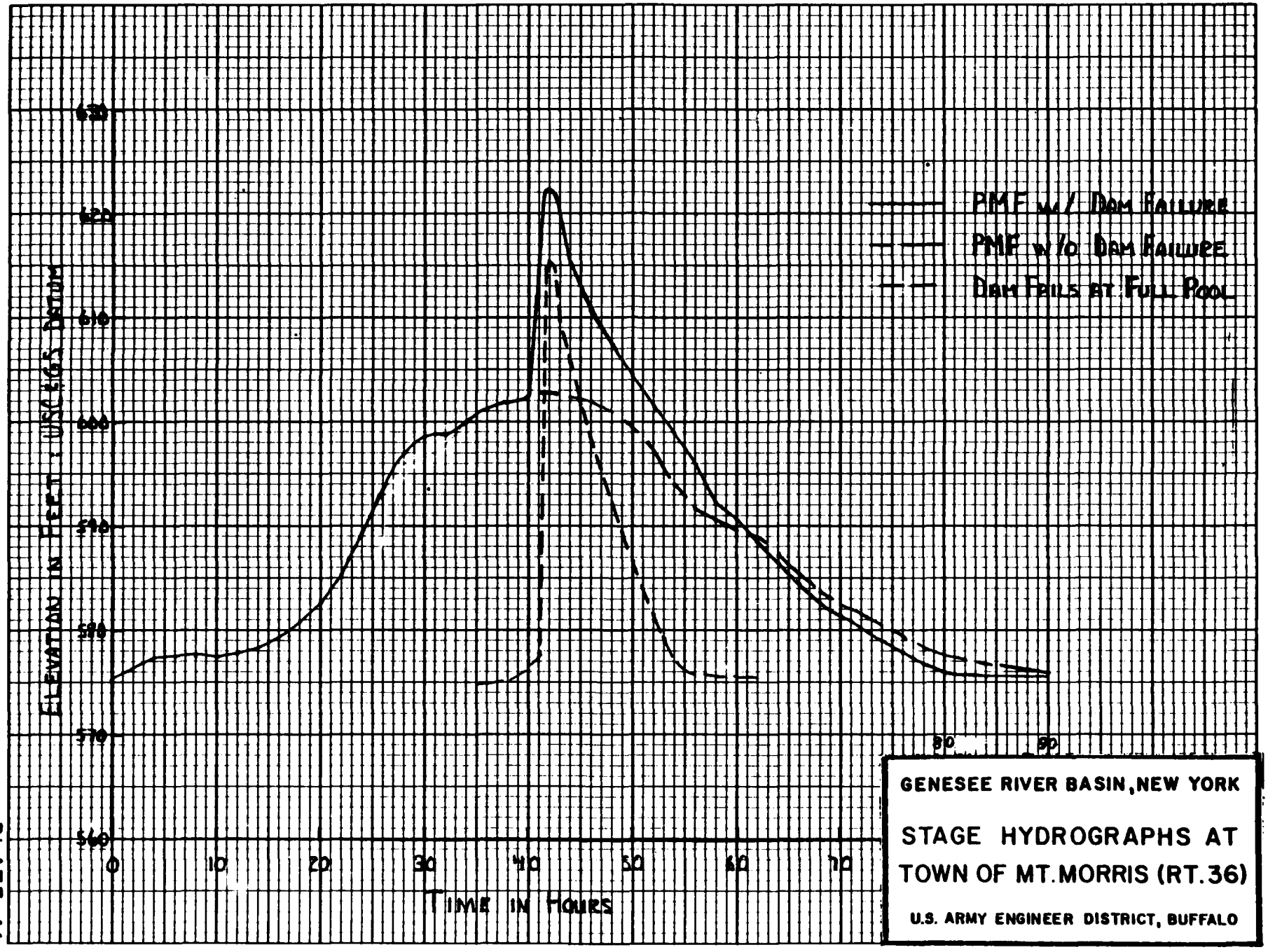
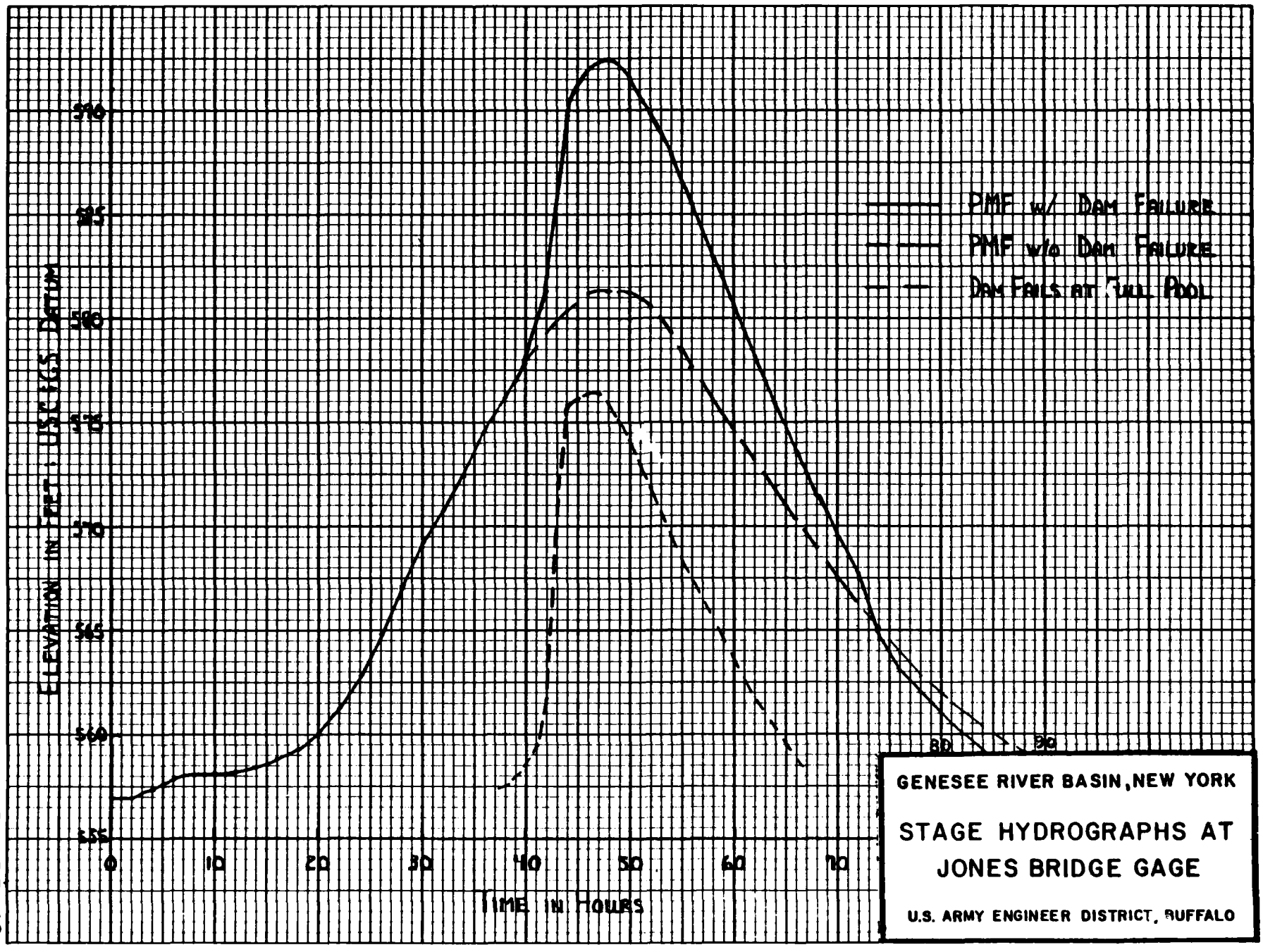


PLATE 11

GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT TOWN OF MT. MORRIS (RT. 36)

U.S. ARMY ENGINEER DISTRICT, BUFFALO



GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT JONES BRIDGE GAGE

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 12

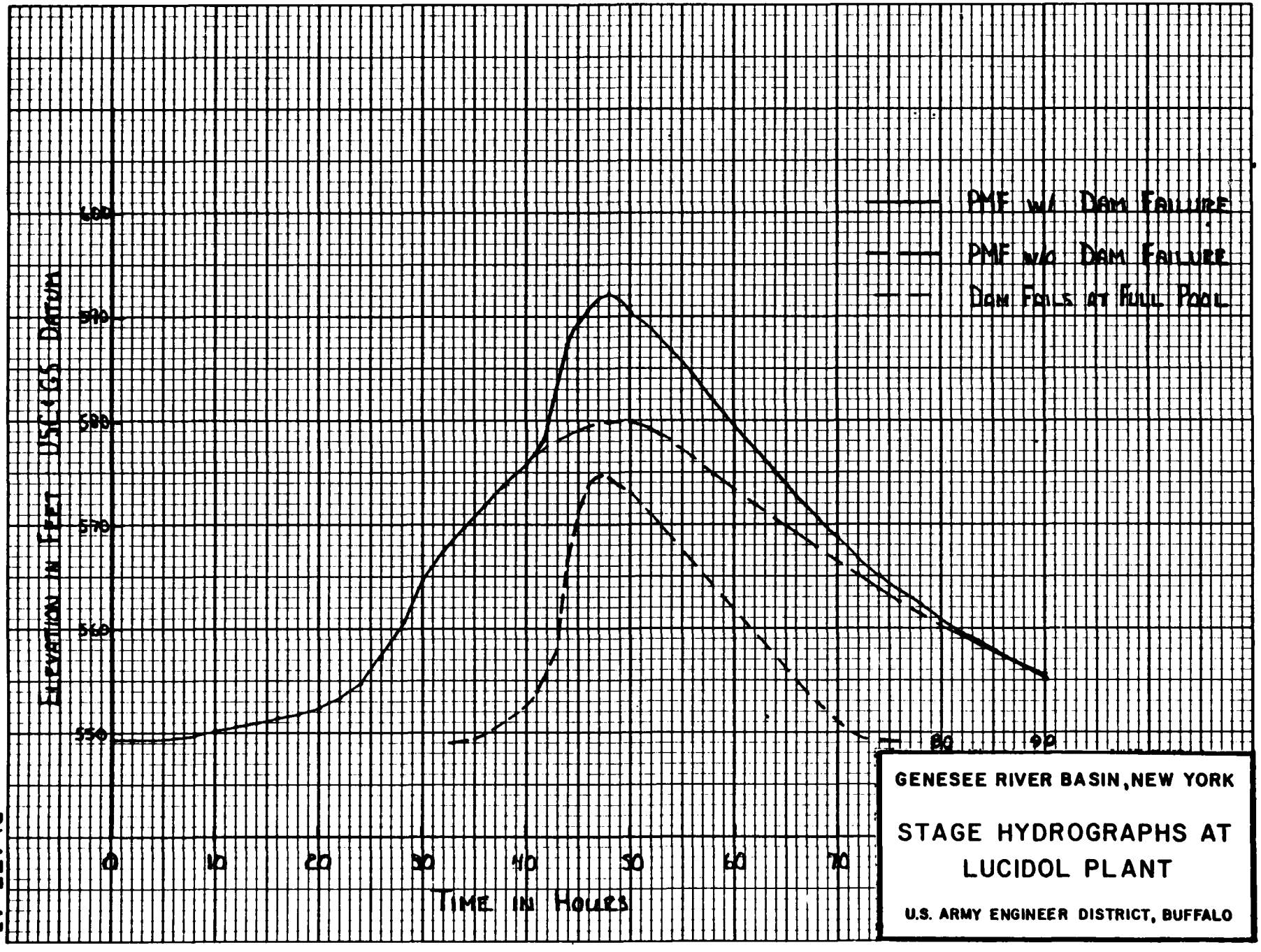
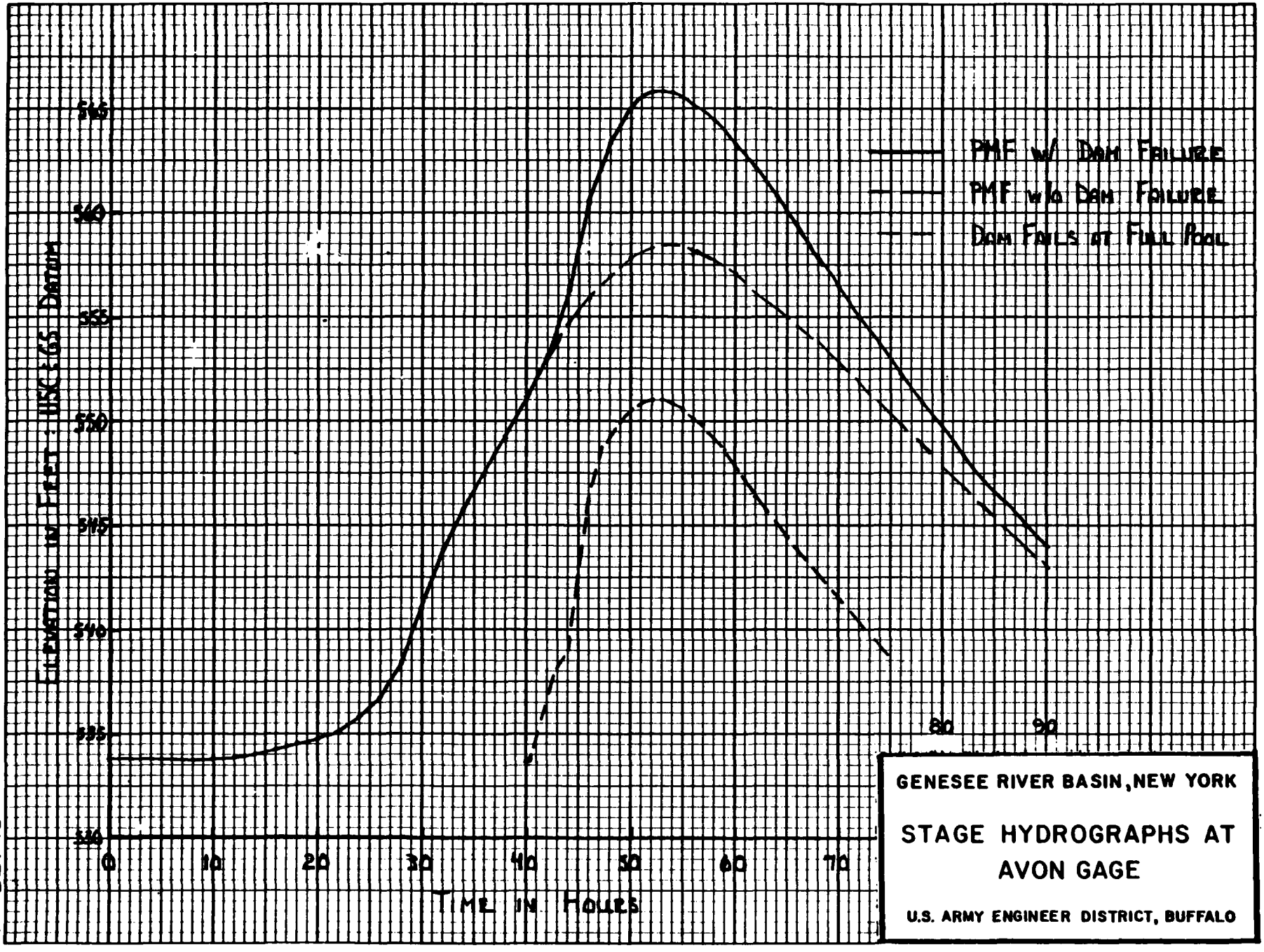


PLATE 13

GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT LUCIDOL PLANT

U.S. ARMY ENGINEER DISTRICT, BUFFALO



GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT AVON GAGE

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 14

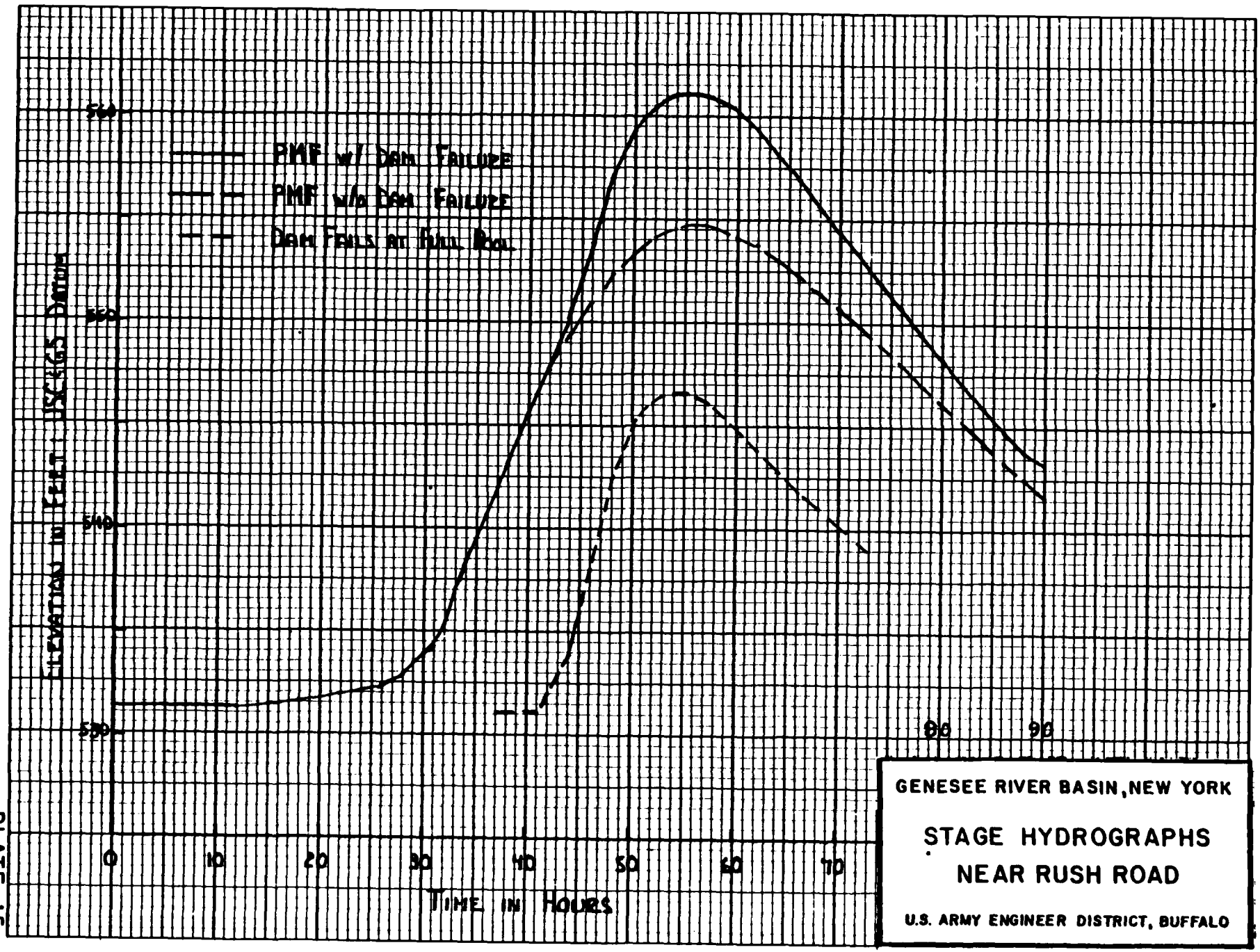
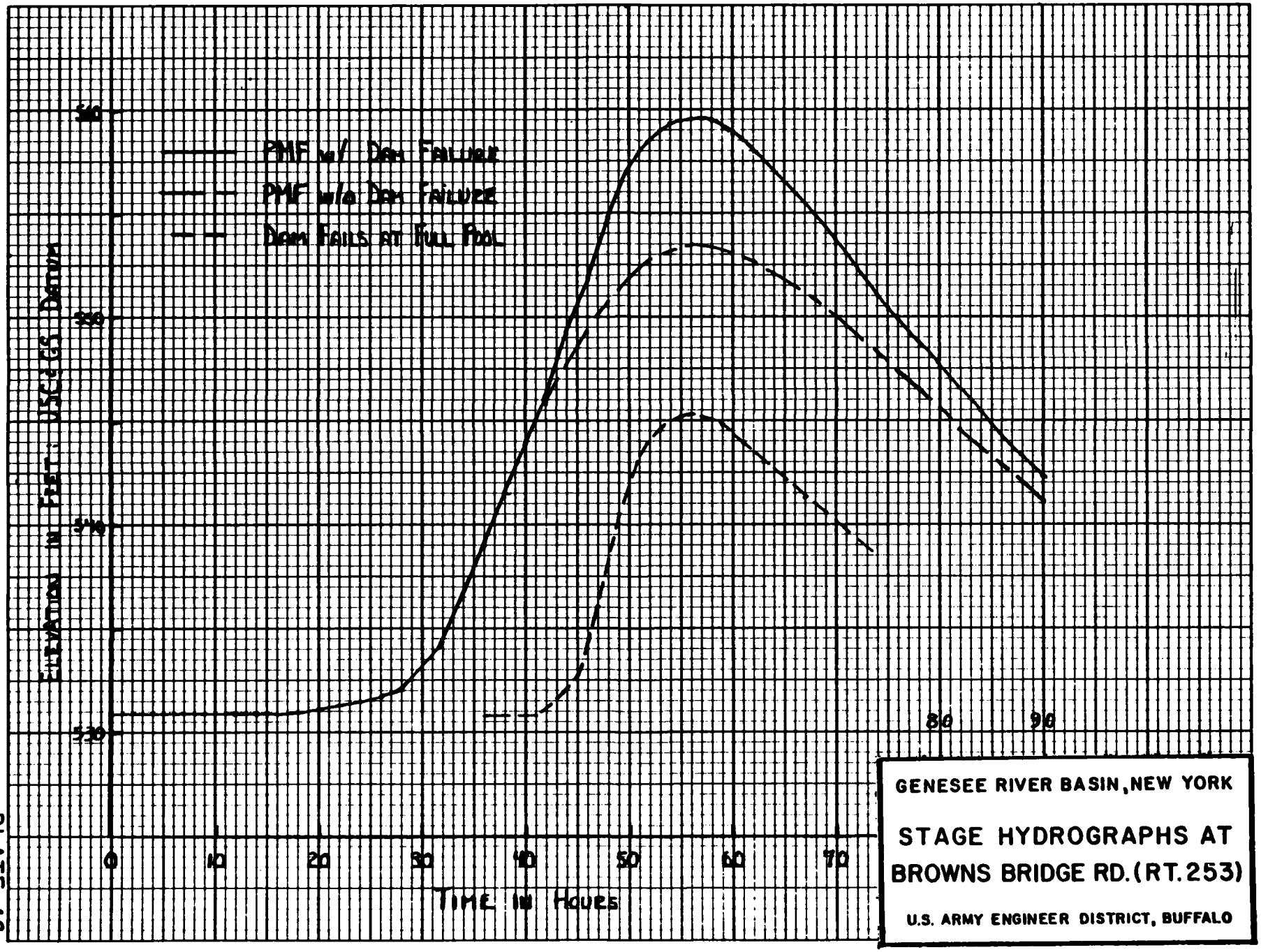


PLATE 15

GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS
NEAR RUSH ROAD

U.S. ARMY ENGINEER DISTRICT, BUFFALO



GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT BROWNS BRIDGE RD. (RT. 253)

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 16

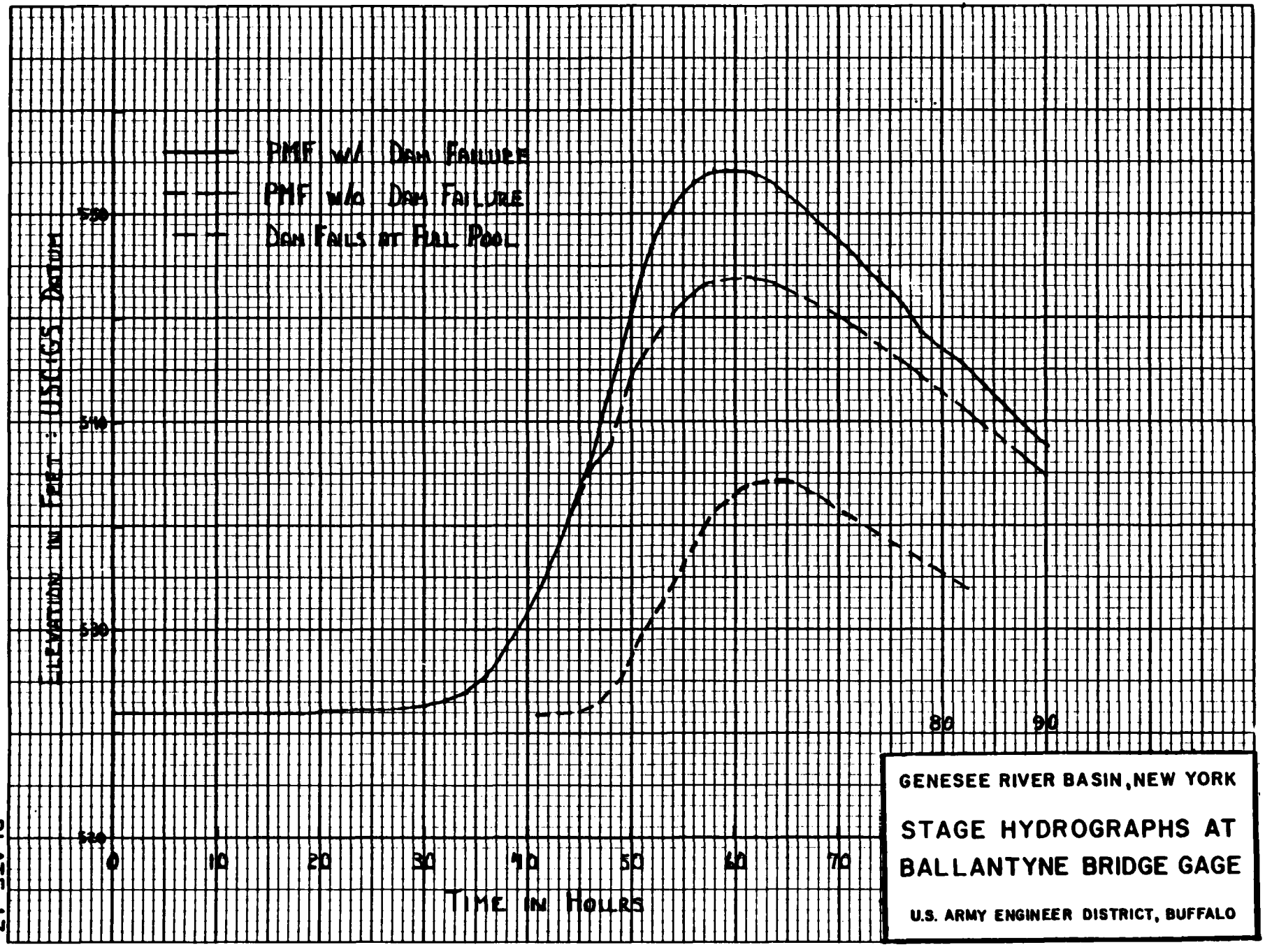
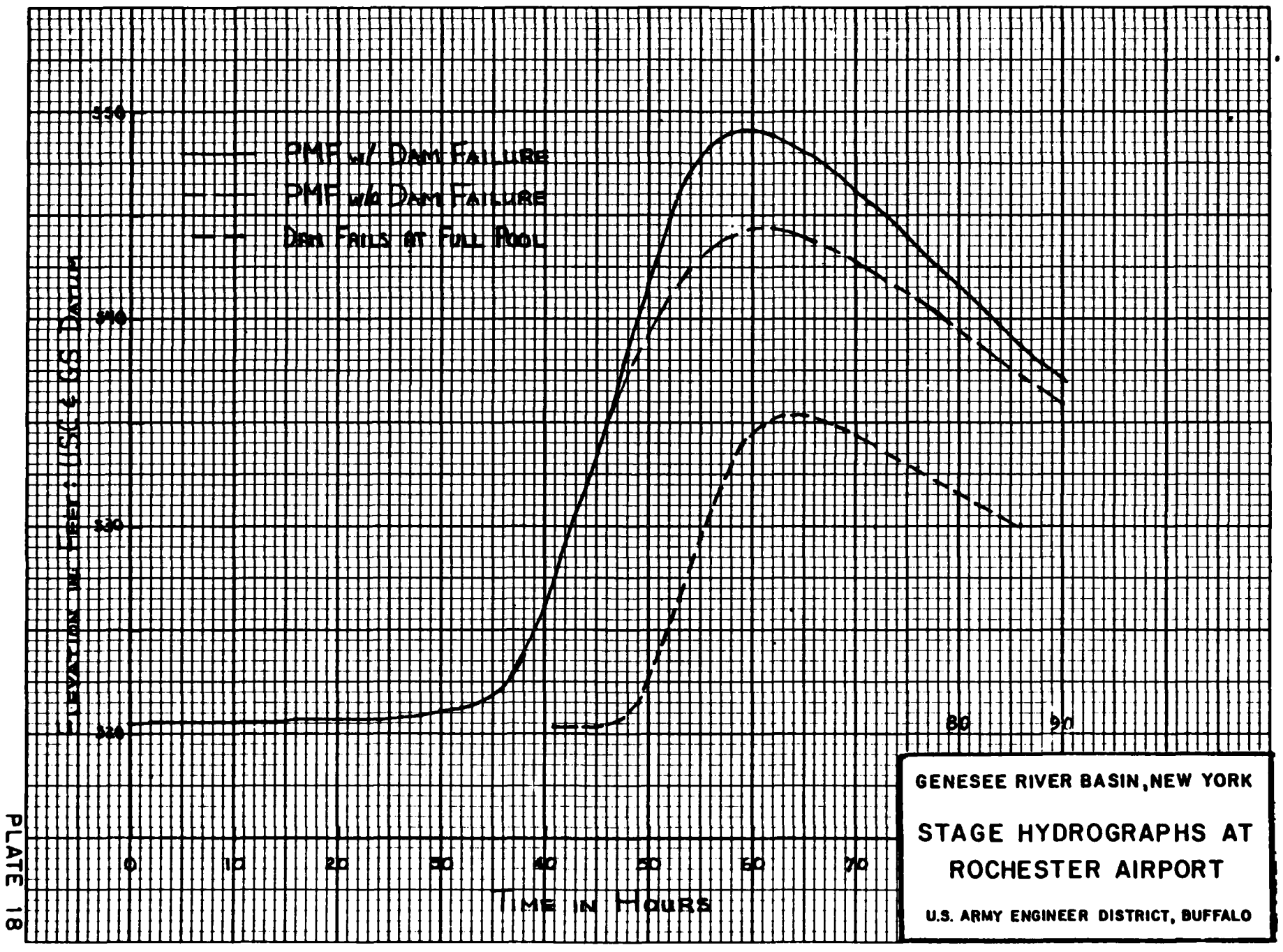


PLATE 17

GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT BALLANTYNE BRIDGE GAGE

U.S. ARMY ENGINEER DISTRICT, BUFFALO

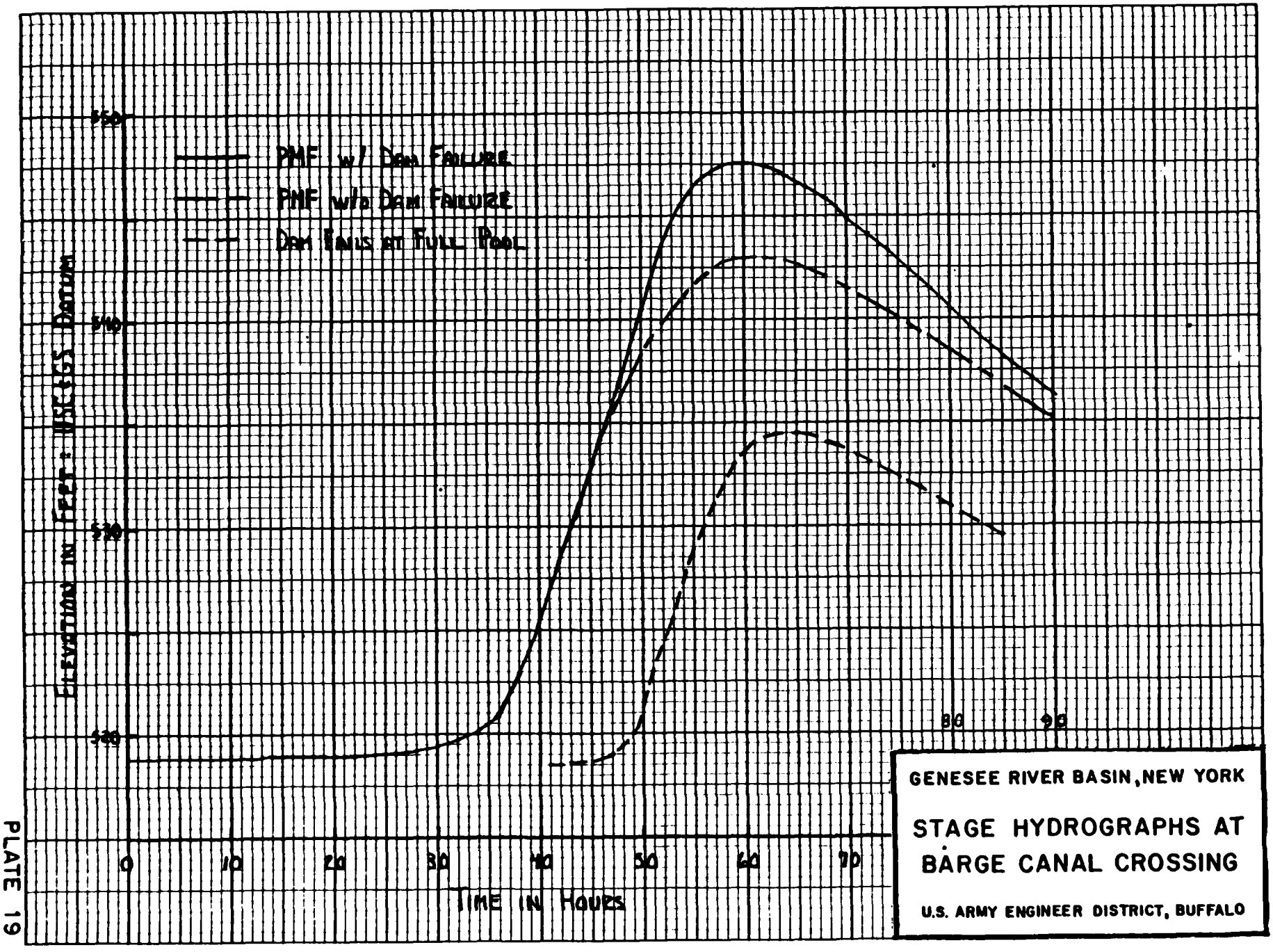


GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT ROCHESTER AIRPORT

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 18



GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT BARGE CANAL CROSSING

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 19

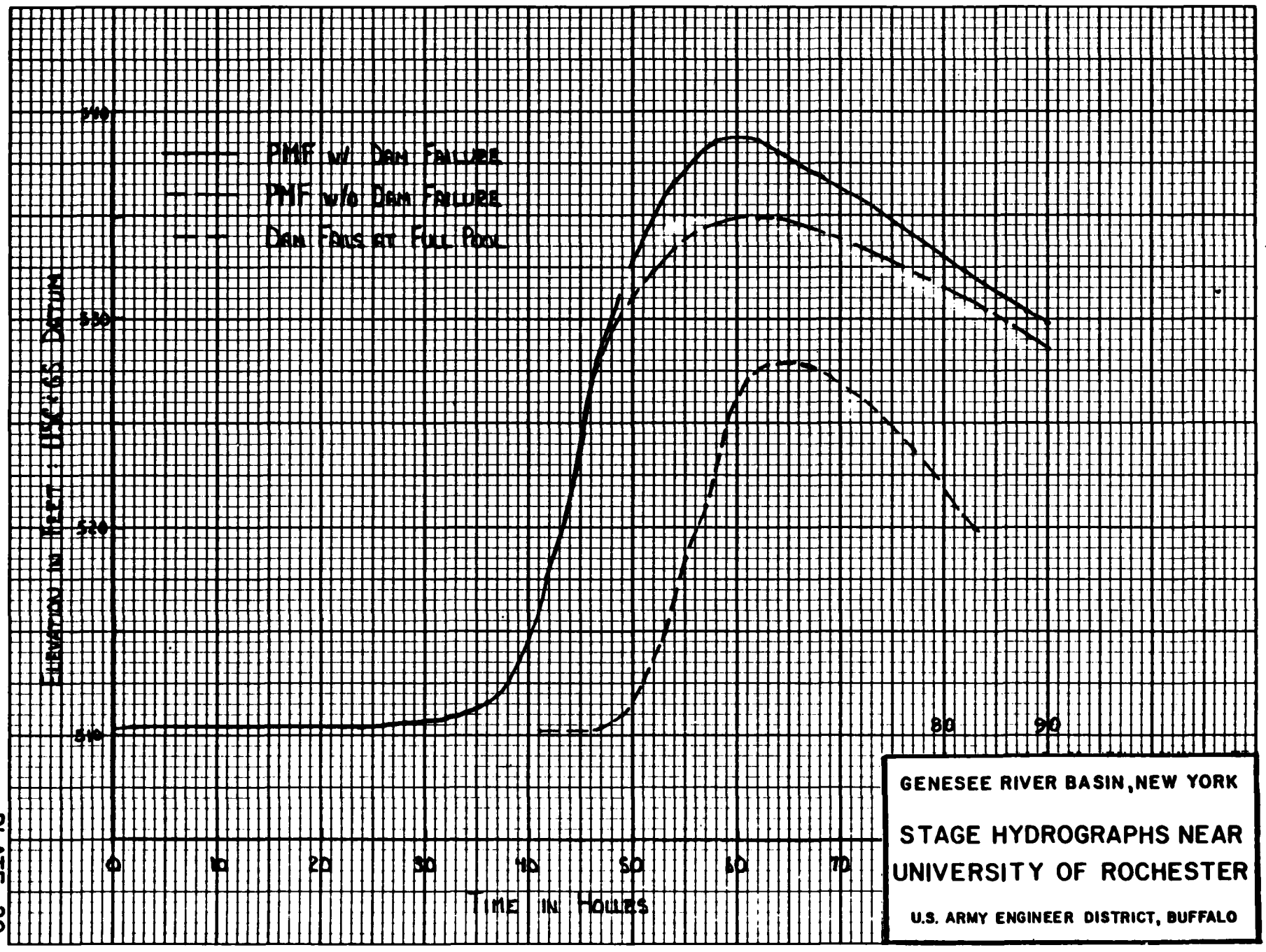


PLATE 20

GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS NEAR
UNIVERSITY OF ROCHESTER

U.S. ARMY ENGINEER DISTRICT, BUFFALO

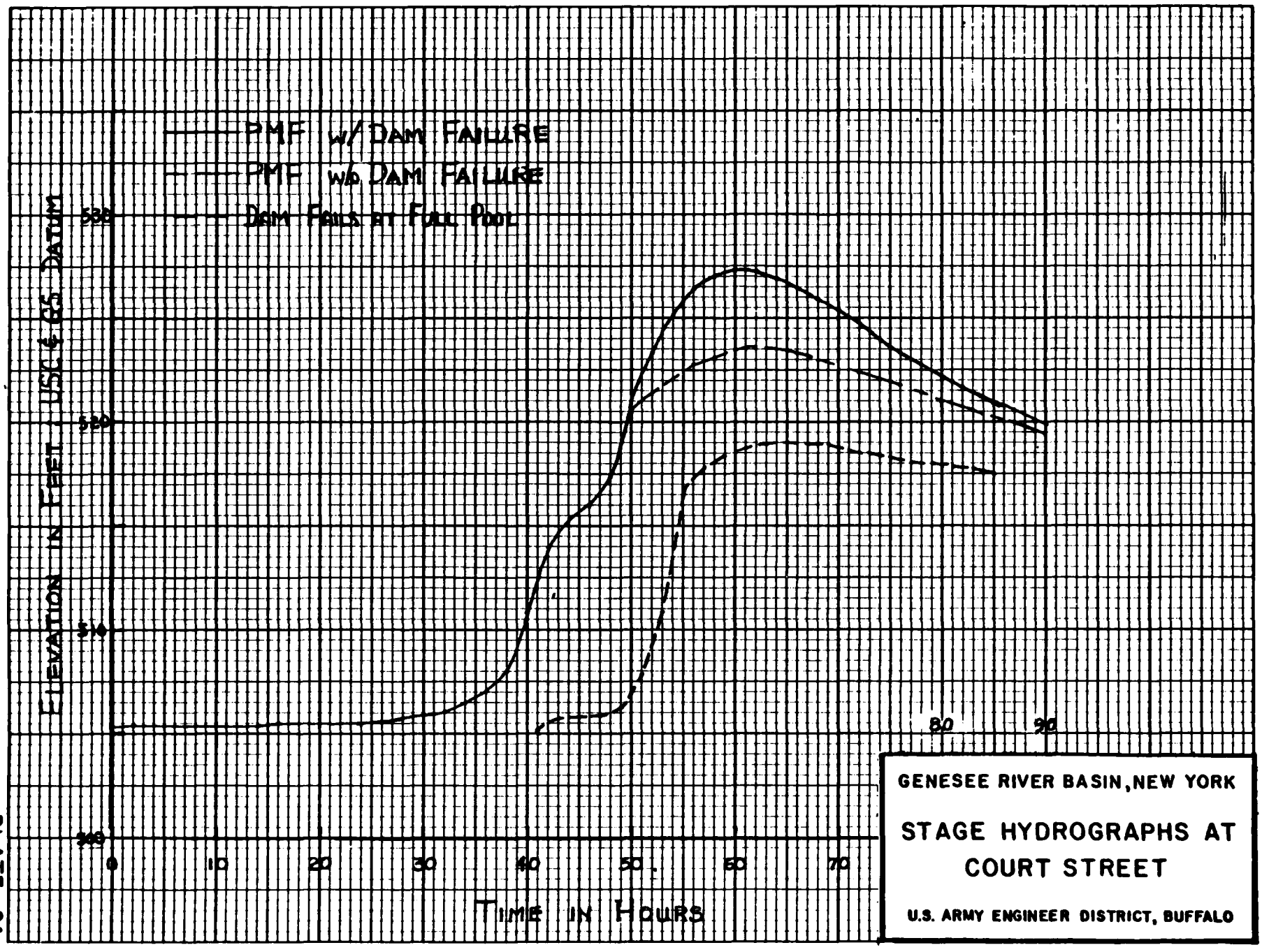
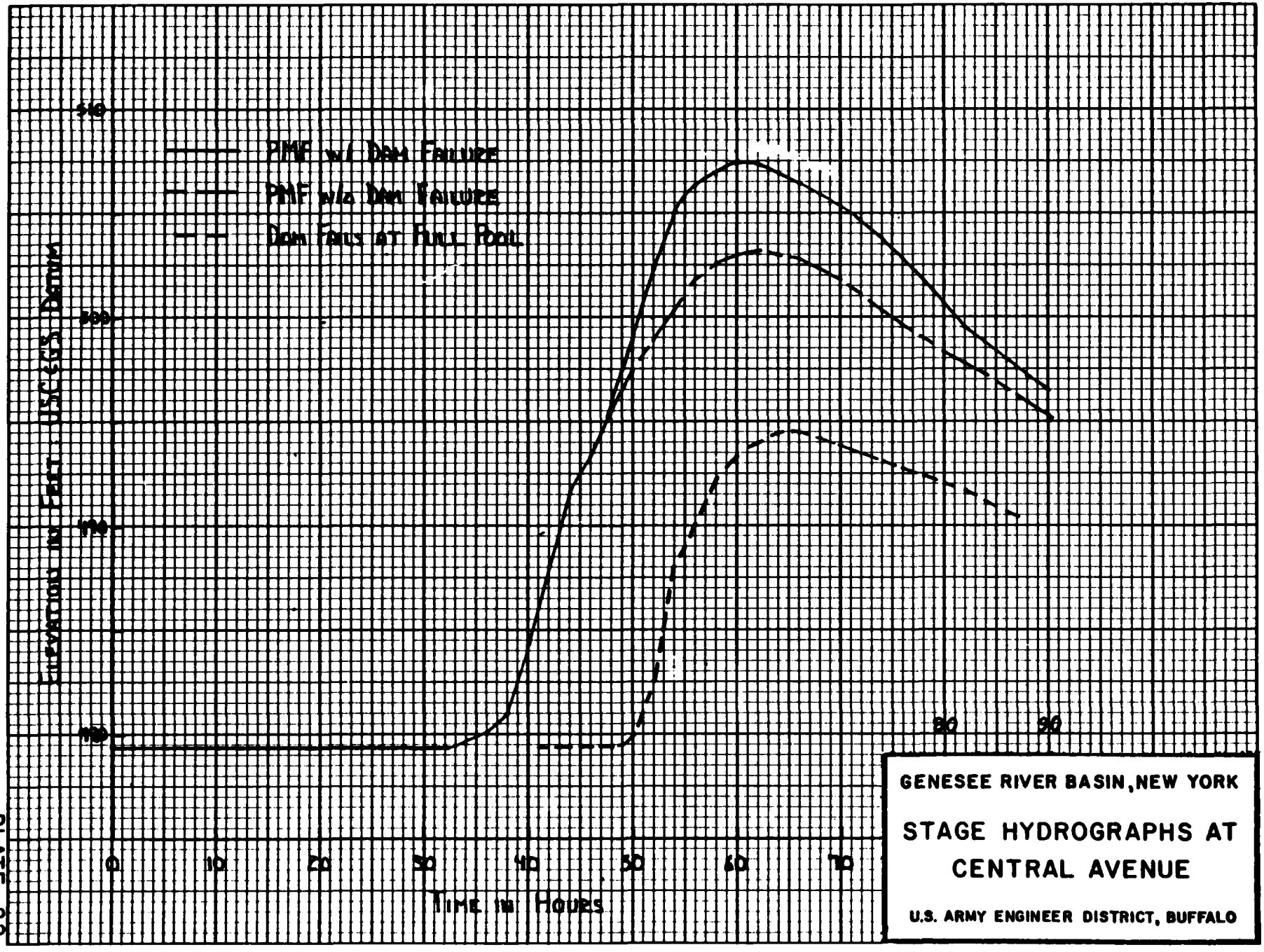


PLATE 21

GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT COURT STREET

U.S. ARMY ENGINEER DISTRICT, BUFFALO

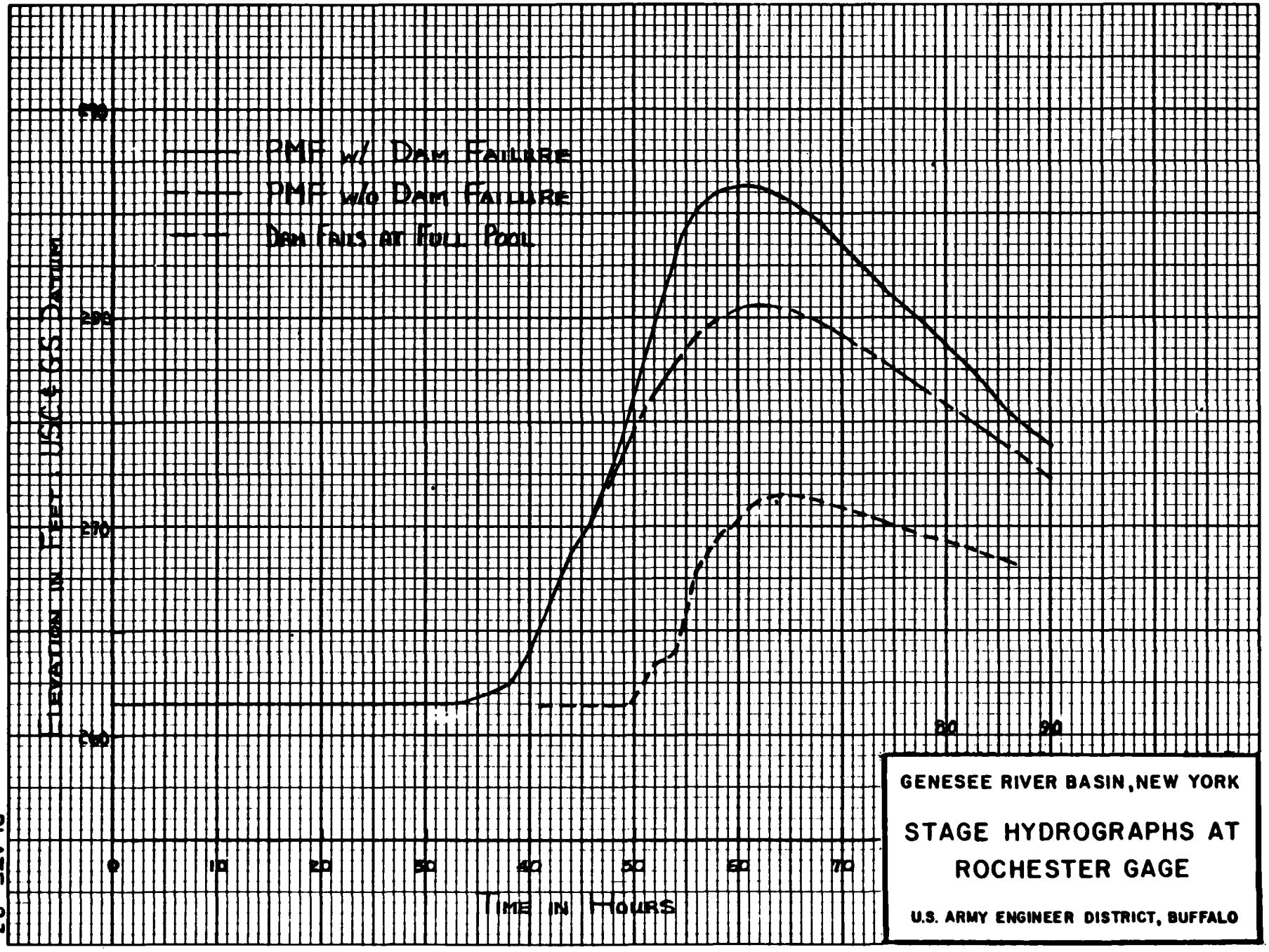


GENESEE RIVER BASIN, NEW YORK

STAGE HYDROGRAPHS AT CENTRAL AVENUE

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 22

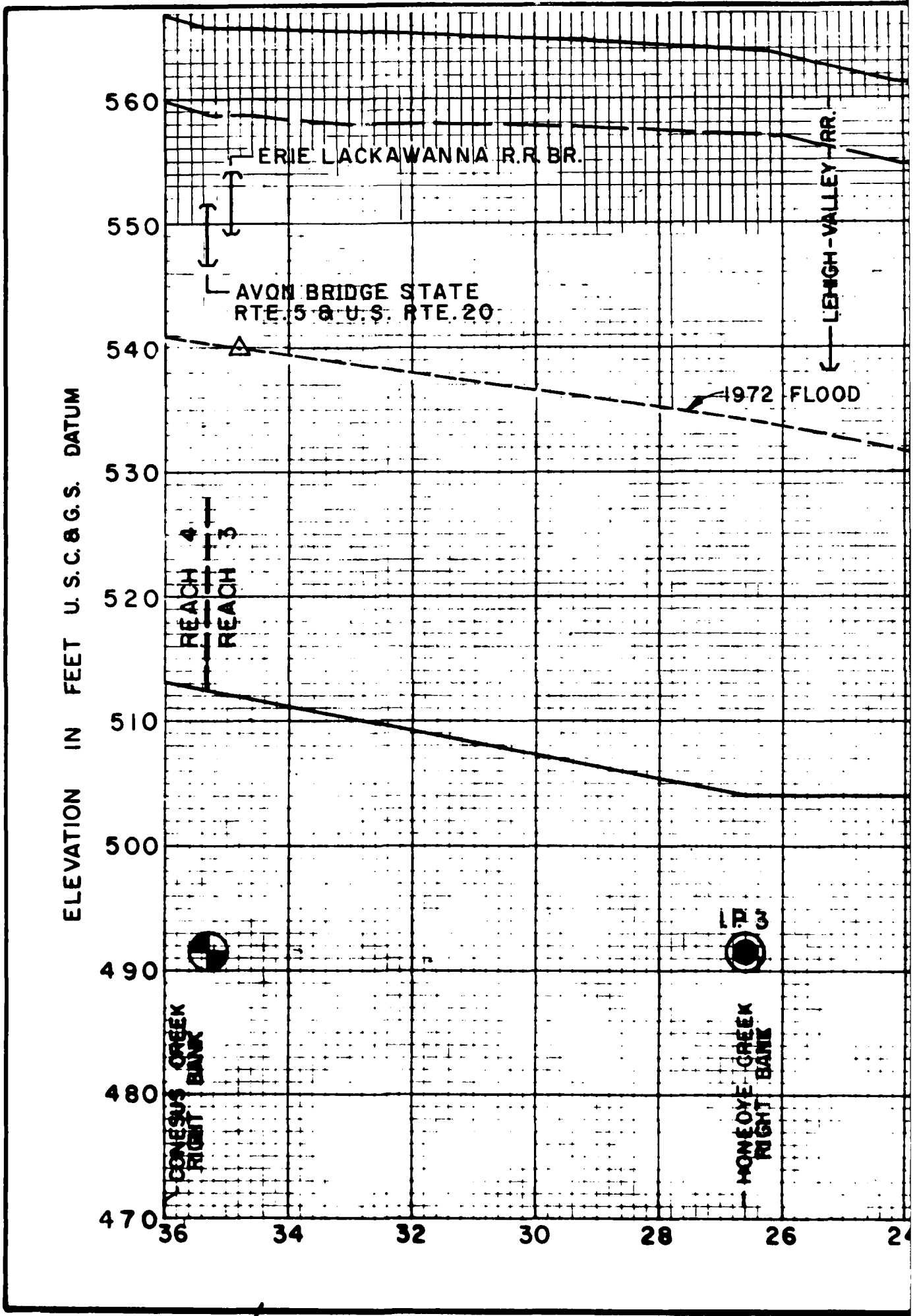


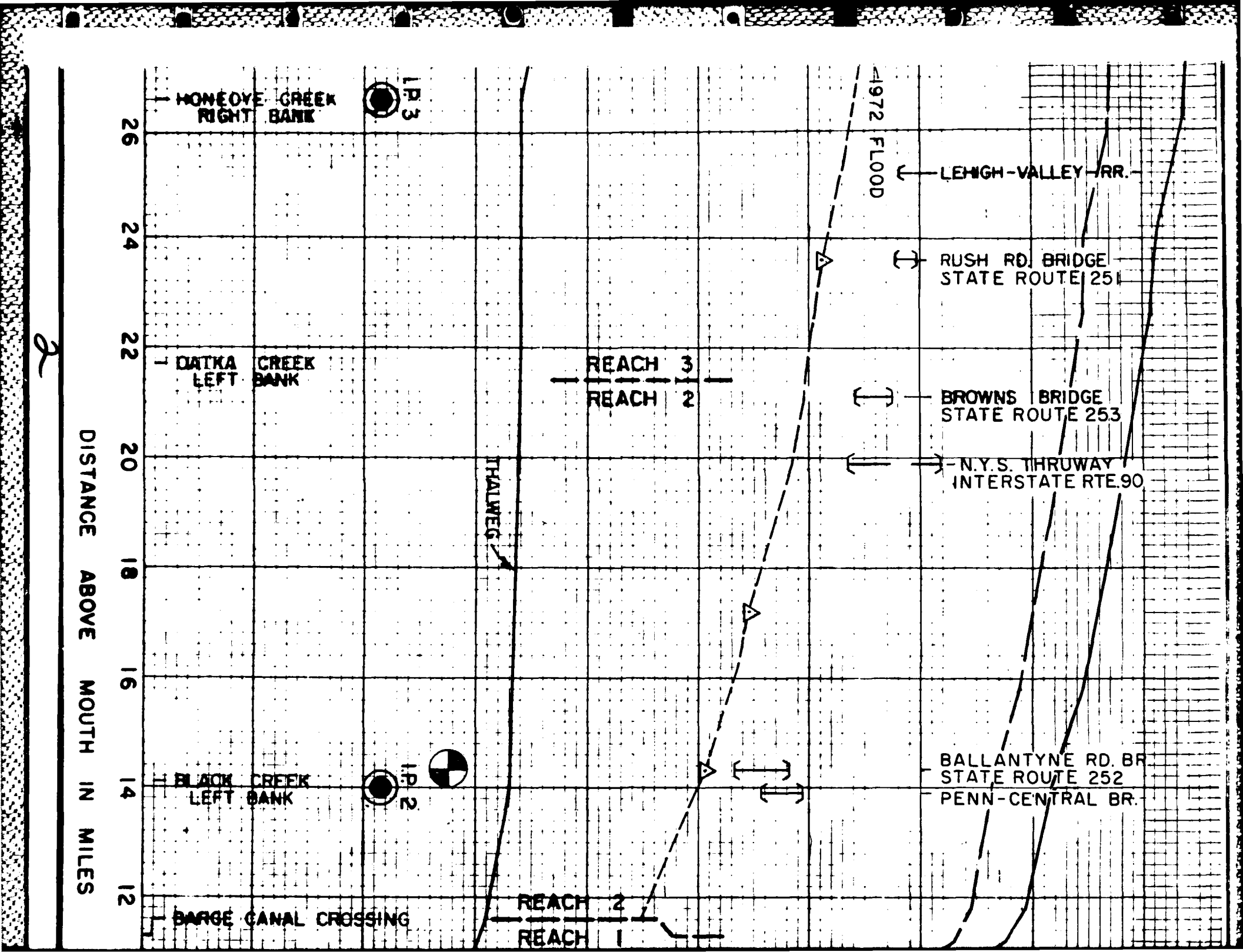
GENESEE RIVER BASIN, NEW YORK

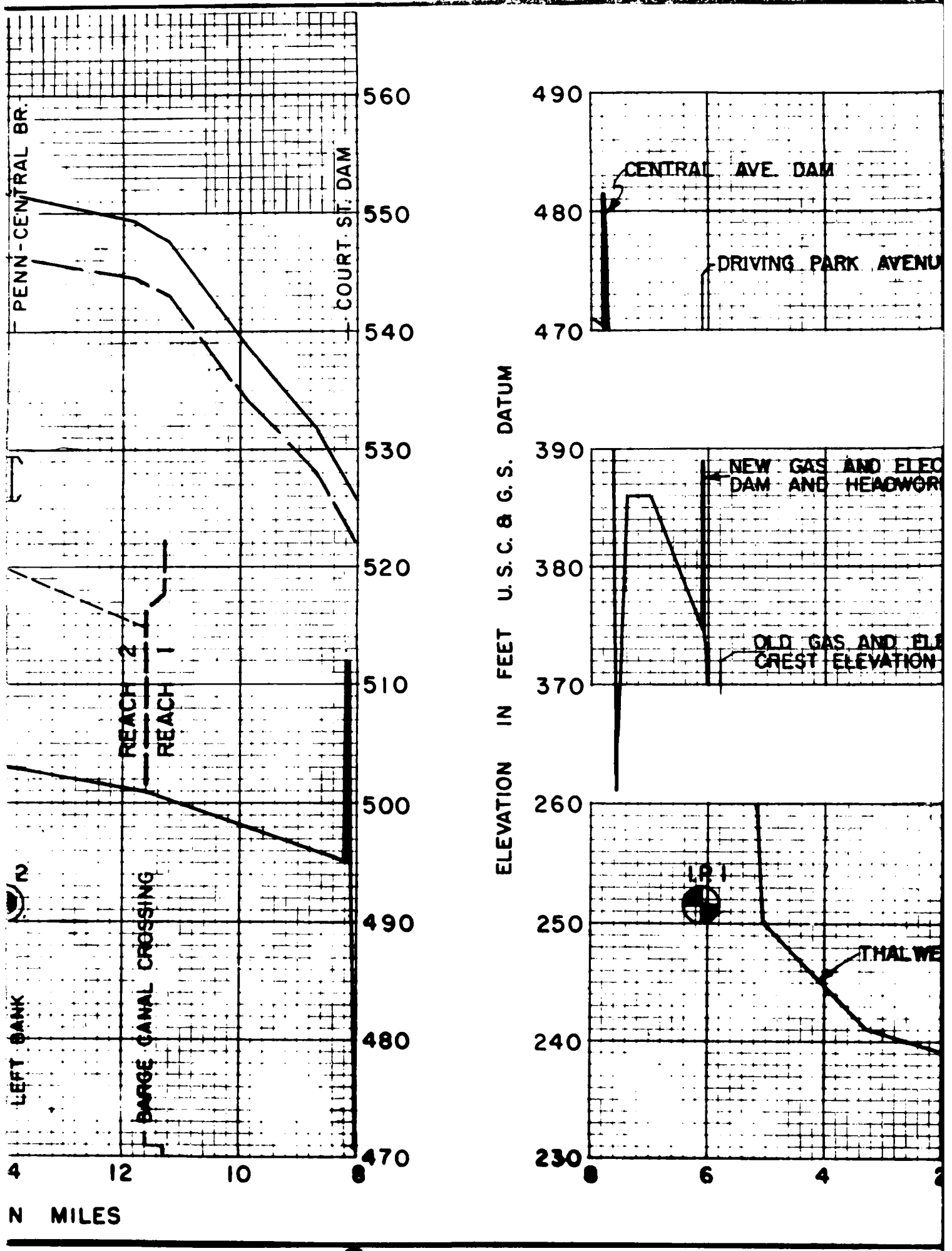
STAGE HYDROGRAPHS AT ROCHESTER GAGE

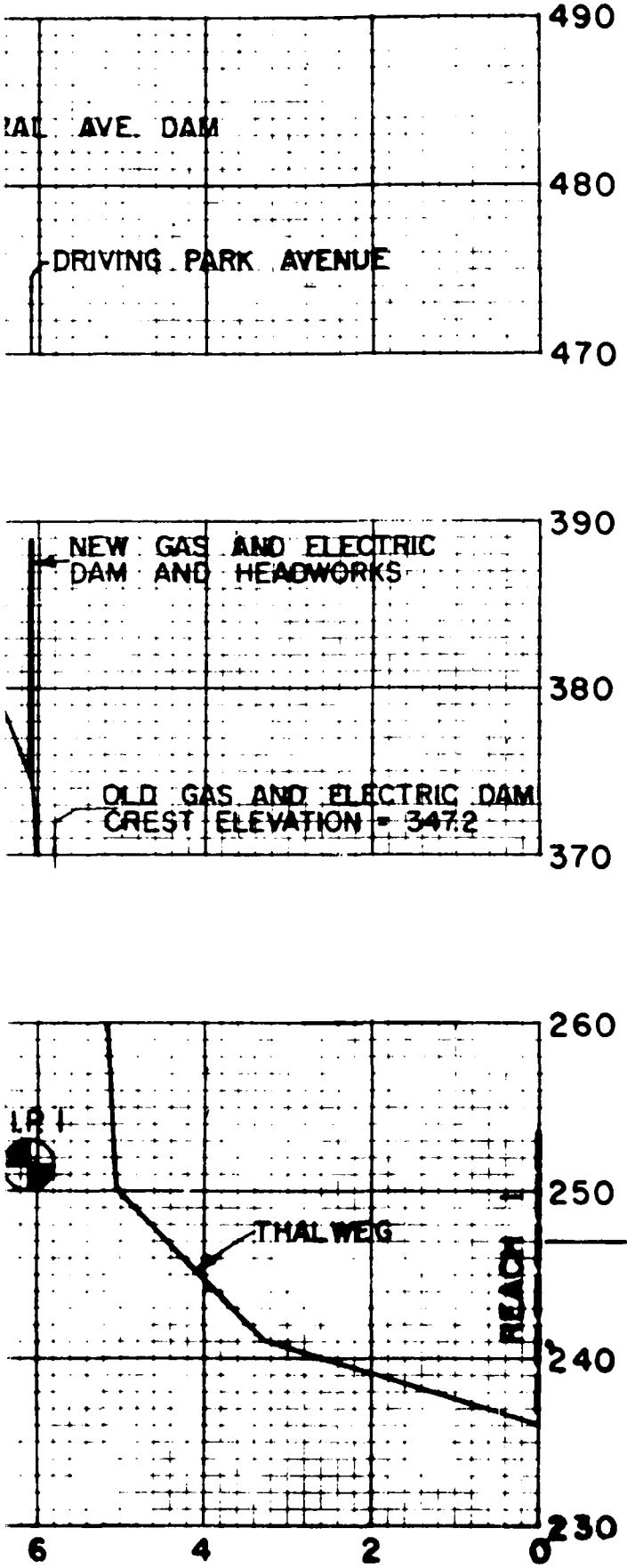
U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 23


560
550
540
530
520
510
500
490
480
470
ELEVATION IN FEET U.S.C.&G.S. DATUM
ERIE LACKAWANNA R.R. BR.
AVON BRIDGE STATE RTE. 5 & U.S. RTE. 20
LEHIGH-VALLEY RR.
1972 FLOOD
REACH 4
REACH 3
I.P. 3
CONESUS CREEK RIGHT BANK
HONEOYE CREEK RIGHT BANK
36
34
32
30
28
26


DISTANCE ABOVE MOUTH IN MILES
26
24
22
20
18
16
14
12
HONEOYE CREEK
RIGHT BANK
I.P. 3
DATKA CREEK
LEFT BANK
BLACK CREEK
LEFT BANK
I.P. 2
BARGE CANAL CROSSING
THALWEG
REACH 3
REACH 2
REACH 2
REACH 1
1972 FLOOD
LEHIGH-VALLEY RR.
RUSH RD. BRIDGE
STATE ROUTE 251
BROWNS BRIDGE
STATE ROUTE 253
N.Y.S. THRUWAY
INTERSTATE RTE. 90
BALLANTYNE RD. BR.
STATE ROUTE 252
PENN-CENTRAL BR.


PENN-CENTRAL BR.
COURT ST. DAM
REACH 2
REACH 1
BARGE CANAL CROSSING
LEFT BANK
560
550
540
530
520
510
500
490
480
470
4
12
10
8
N MILES
CENTRAL AVE. DAM
DRIVING PARK AVENU
NEW GAS AND ELEC
DAM AND HEADWOR
OLD GAS AND EL
CREST ELEVATION
LP 1
THALWE
490
480
470
390
380
370
260
250
240
230
8
6
4
ELEVATION IN FEET U.S.C. & G.S. DATUM



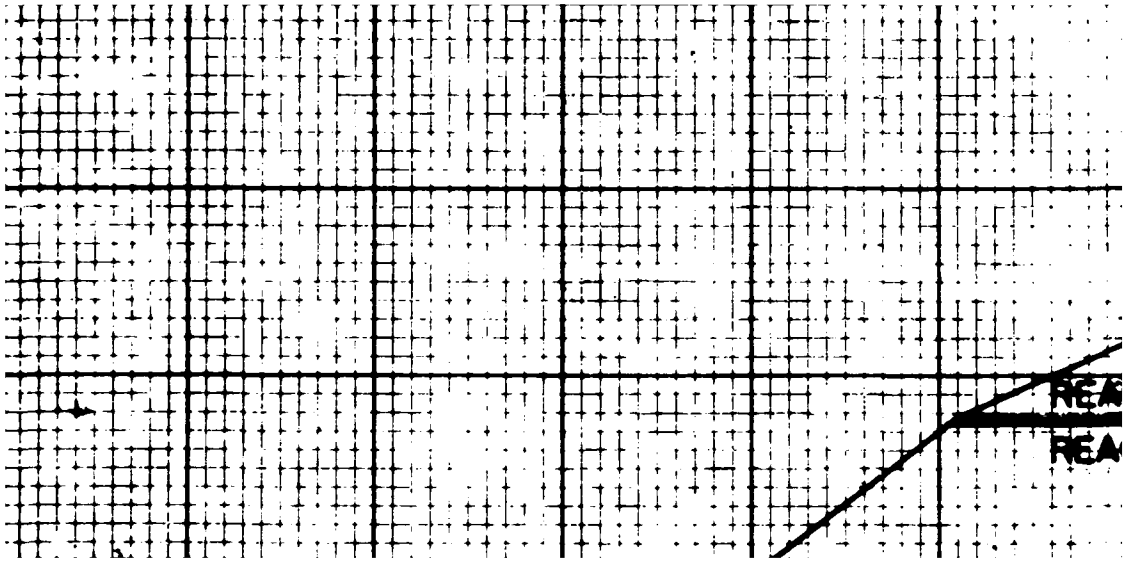
LEGEND:

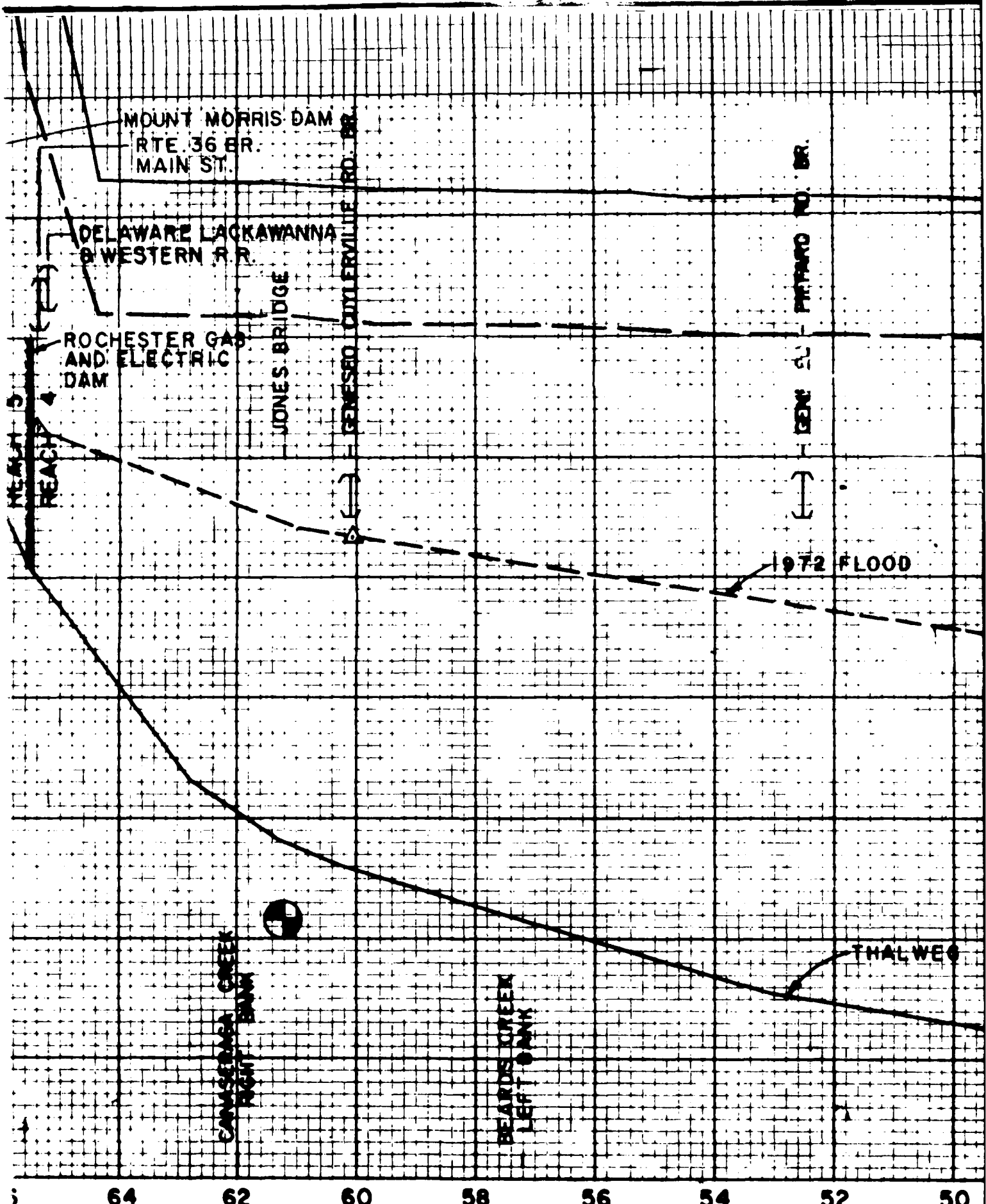
- U.S.G.S. RECORDING GAGE
- I.P.2 INDEX POINT REACH 2
- HIGH WATER MARK
- APPROXIMATE FLOOR EL.
- APPROXIMATE LOW CHORD EL.
- PROBABLE MAXIMUM FLOOD WITH DAM FAILURE.
- PROBABLE MAXIMUM FLOOD WITHOUT DAM FAILURE.

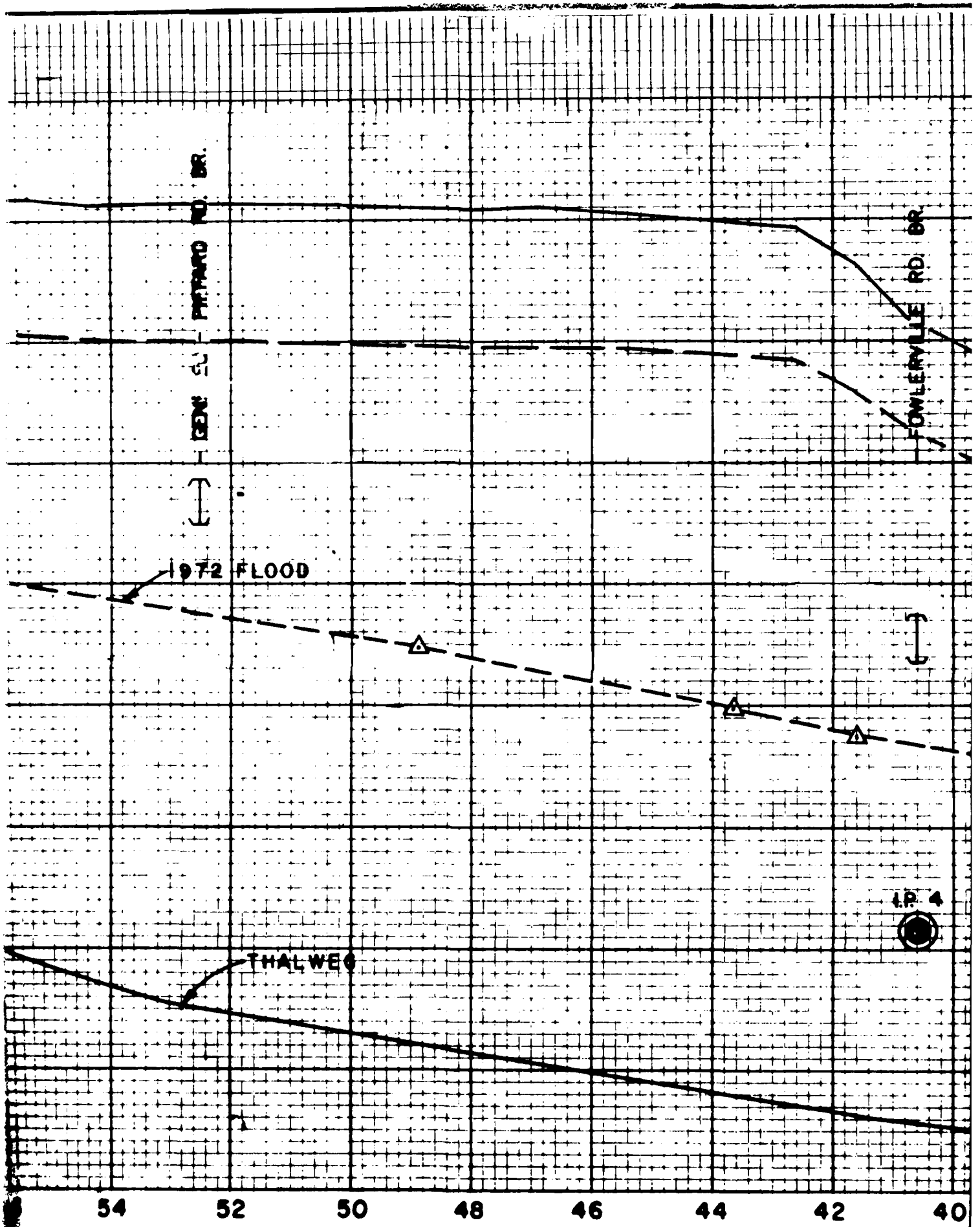
GENESEE RIVER BASIN, NEW YORK

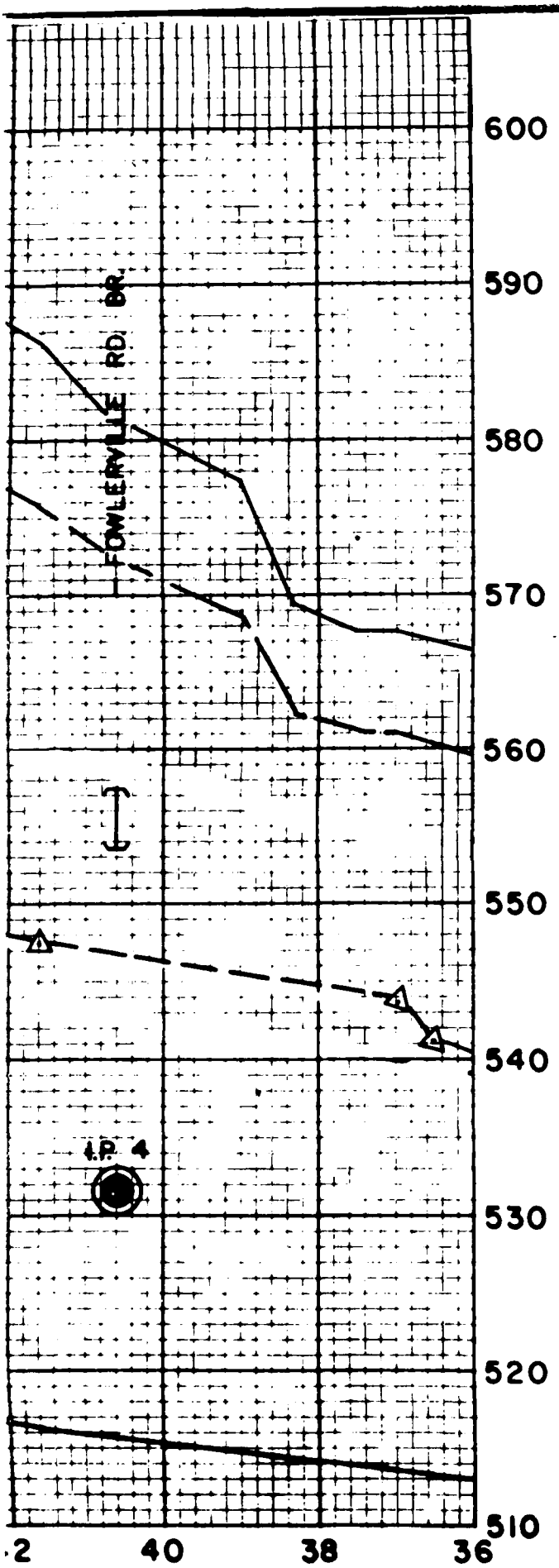
PROFILES
GENESEE RIVER
MILE 0 TO 36

U.S. ARMY ENGINEER DISTRICT, BUFFALO




MOUNT MORRIS DAM
RTE. 36 BR.
MAIN ST.
DELAWARE LACKAWANNA & WESTERN R.R.
ROCHESTER GAS AND ELECTRIC DAM
REACH 4
REACH 3
JONES BRIDGE
GENESEO CUTOFF R.R. BR.
PENNSYLVANIA R.R. BR.
1972 FLOOD
THALWEG
CANASERAGA CREEK RIGHT BANK
BEARDS CREEK LEFT BANK
64
62
60
58
56
54
52
50
DISTANCE ABOVE MOUTH IN MI


PITTSBORO RD. BR.
GEORGE
FOWLERVILLE RD. BR.
1972 FLOOD
I.P. 4
THALWEG
54
52
50
48
46
44
42
40
CE ABOVE MOUTH IN MILES



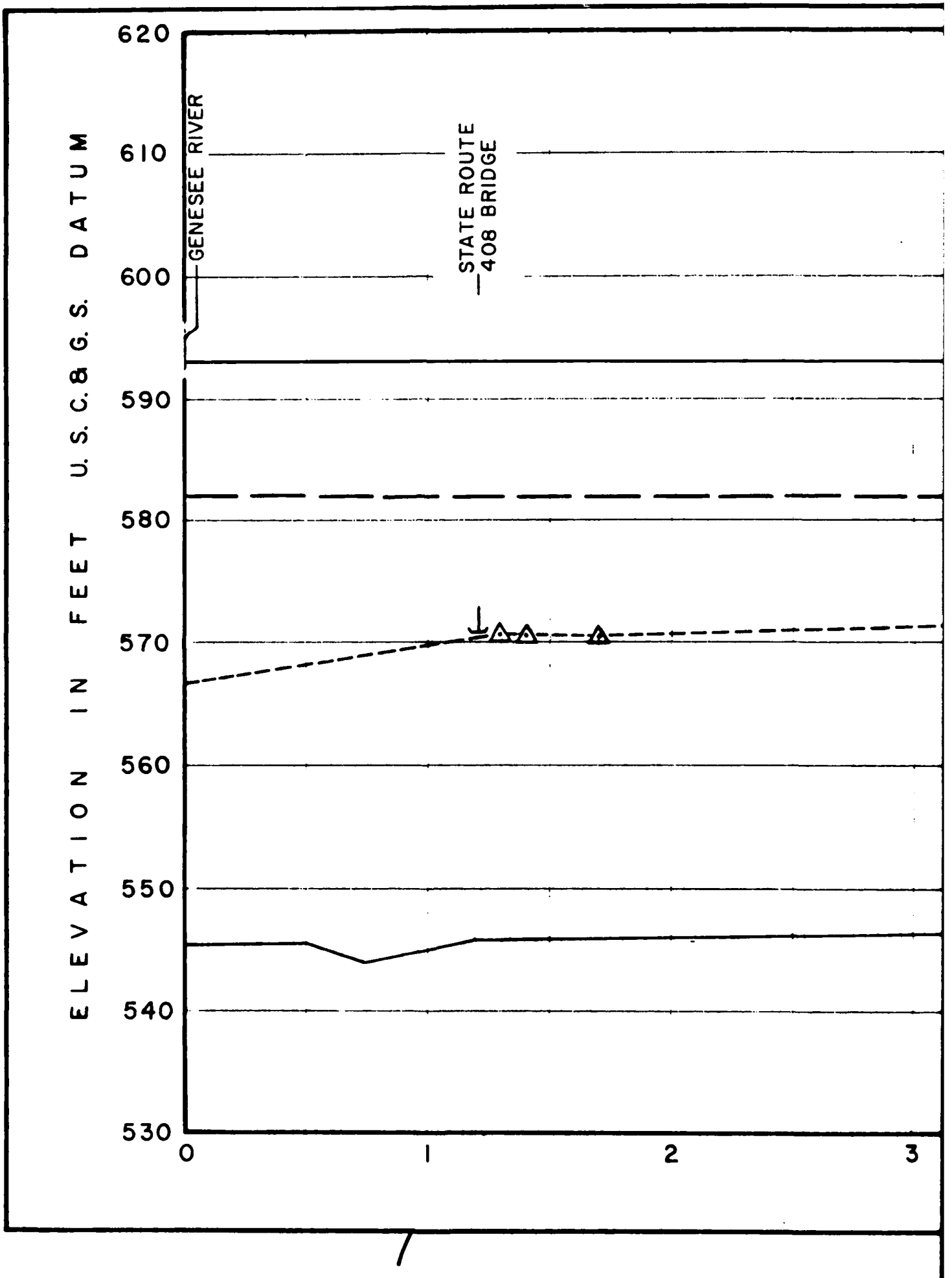
NOTE:
FOR LEGEND SEE PLATE 24

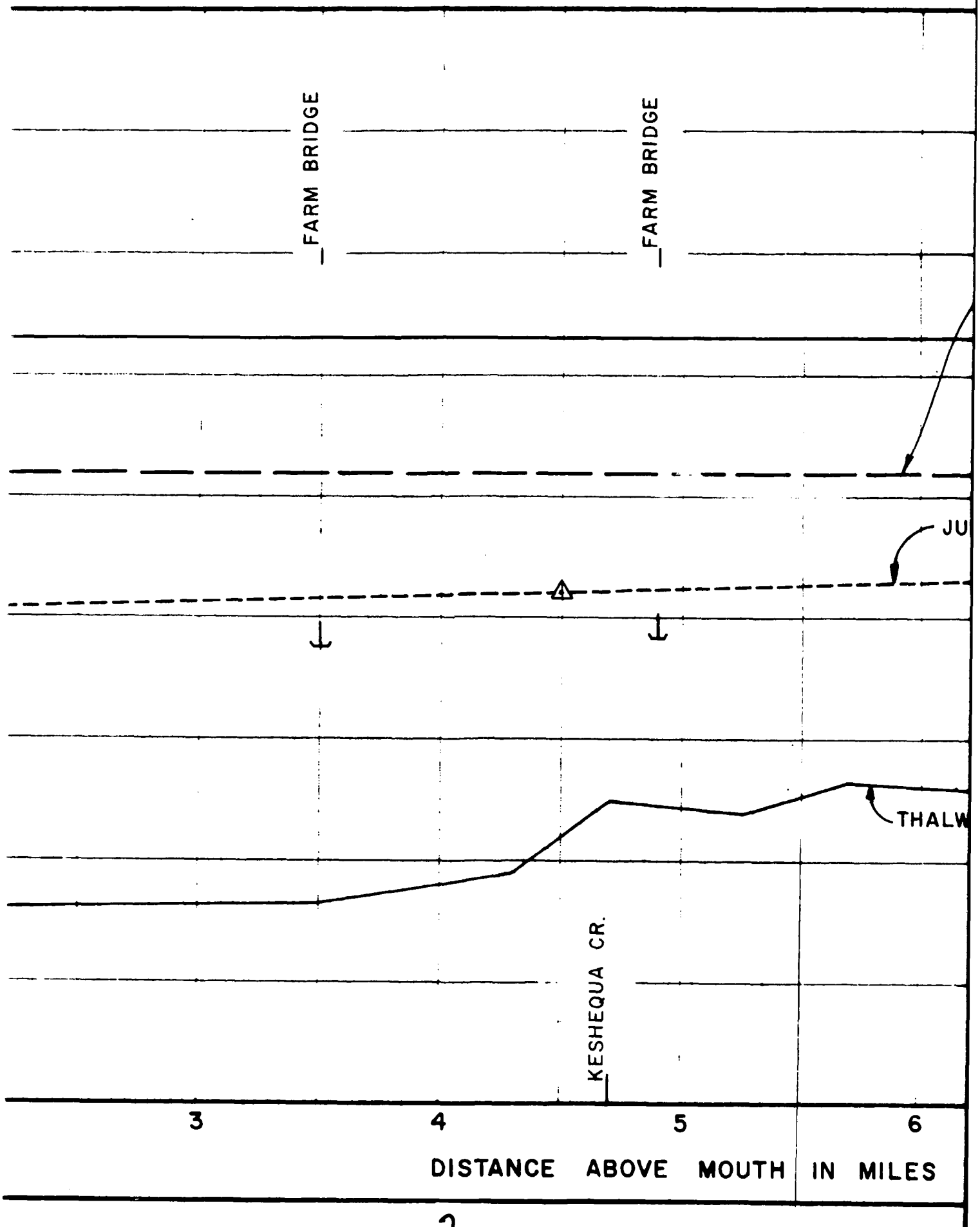
GENESEE RIVER BASIN, NEW YORK

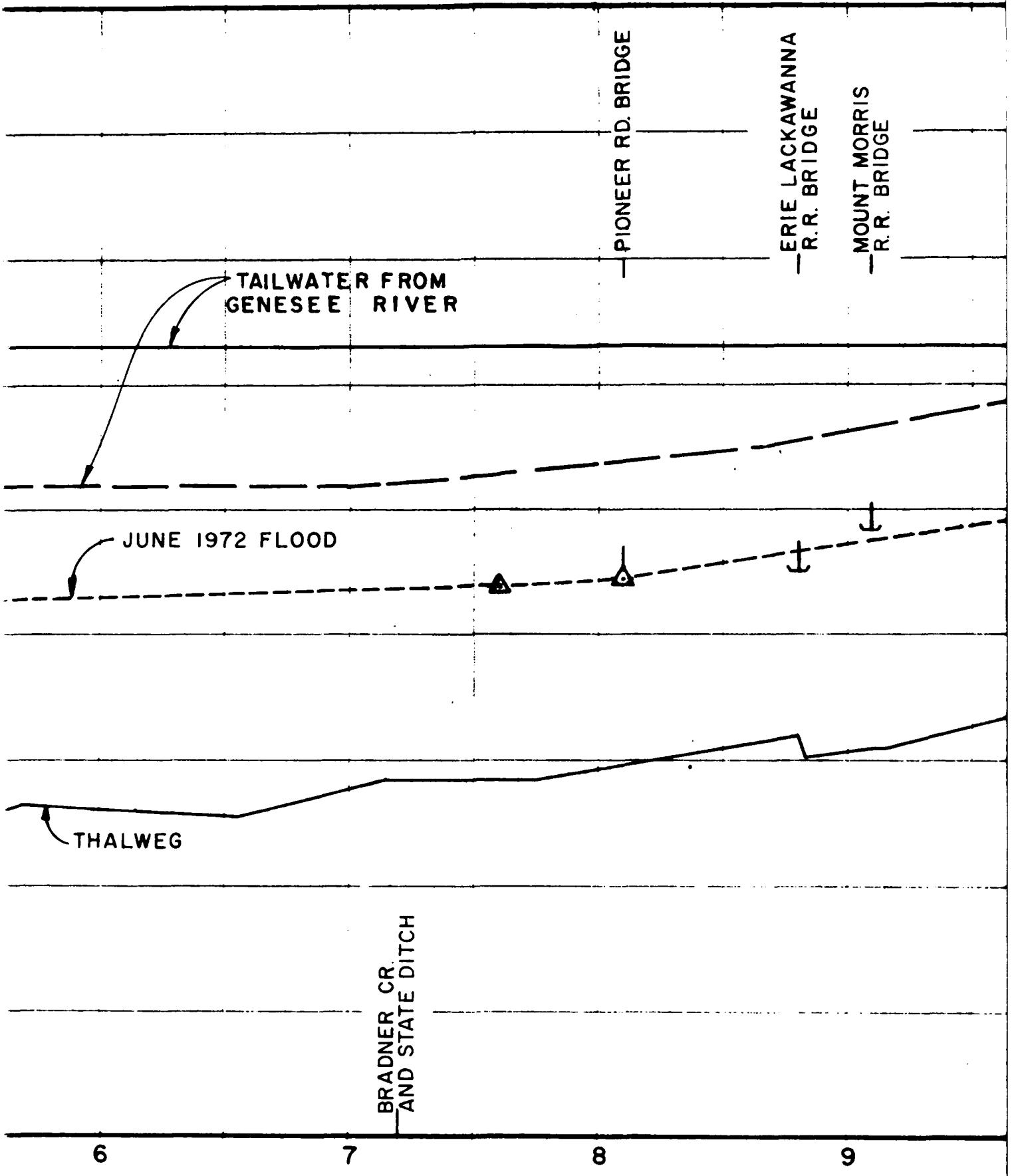
PROFILES
GENESEE RIVER
MILE 36 TO 70

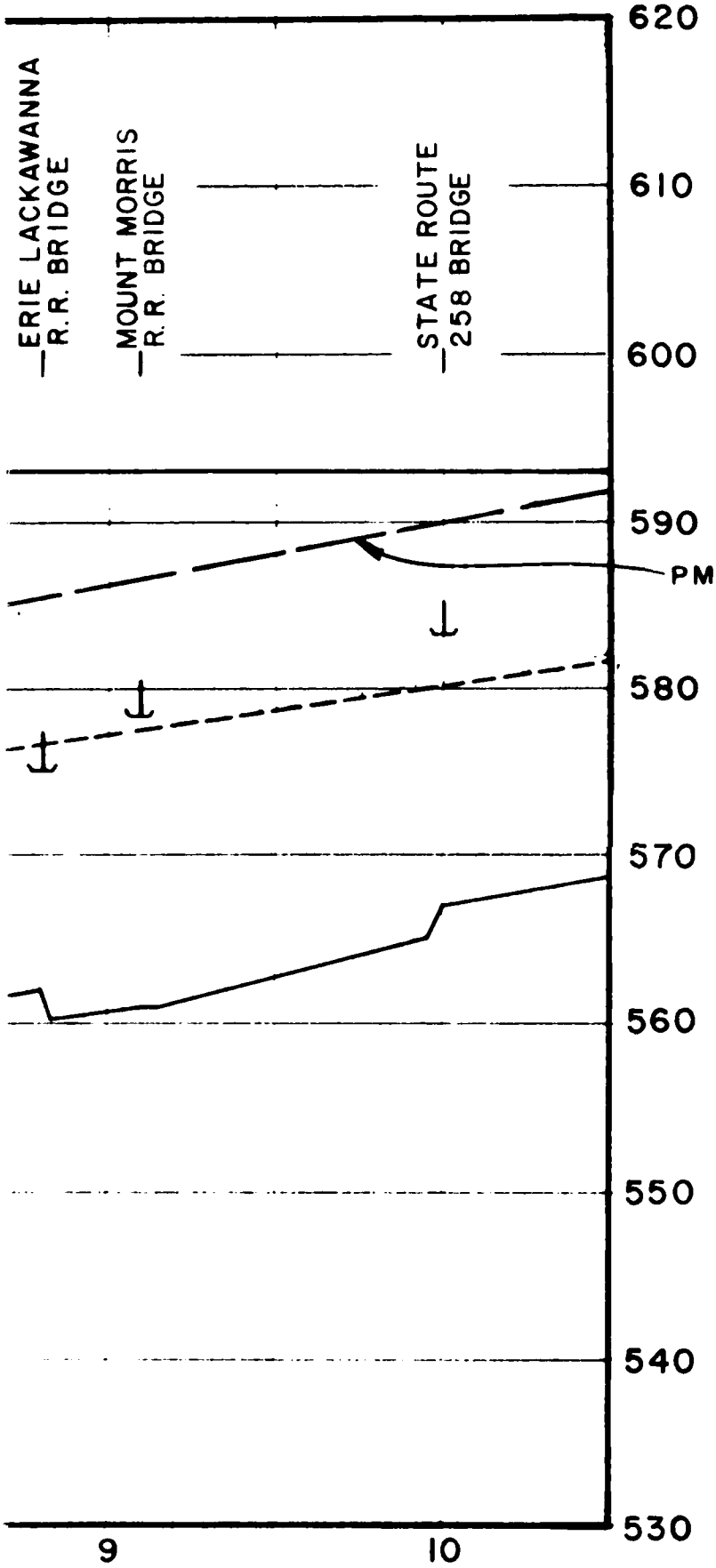
U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 25


620
610
600
590
580
570
560
550
540
530
0
1
2
3
GENESEE RIVER
STATE ROUTE
408 BRIDGE
ELEVATION IN FEET U.S.C.&G.S. DATUM


FARM BRIDGE
FARM BRIDGE
JU
THALW
KESHEQUA CR.
3
4
5
6
DISTANCE ABOVE MOUTH IN MILES


PIONEER RD. BRIDGE
ERIE LACKAWANNA R.R. BRIDGE
MOUNT MORRIS R.R. BRIDGE
TAILWATER FROM GENESEE RIVER
JUNE 1972 FLOOD
THALWEG
BRADNER CR. AND STATE DITCH
6
7
8
9
MILES



NOTE:

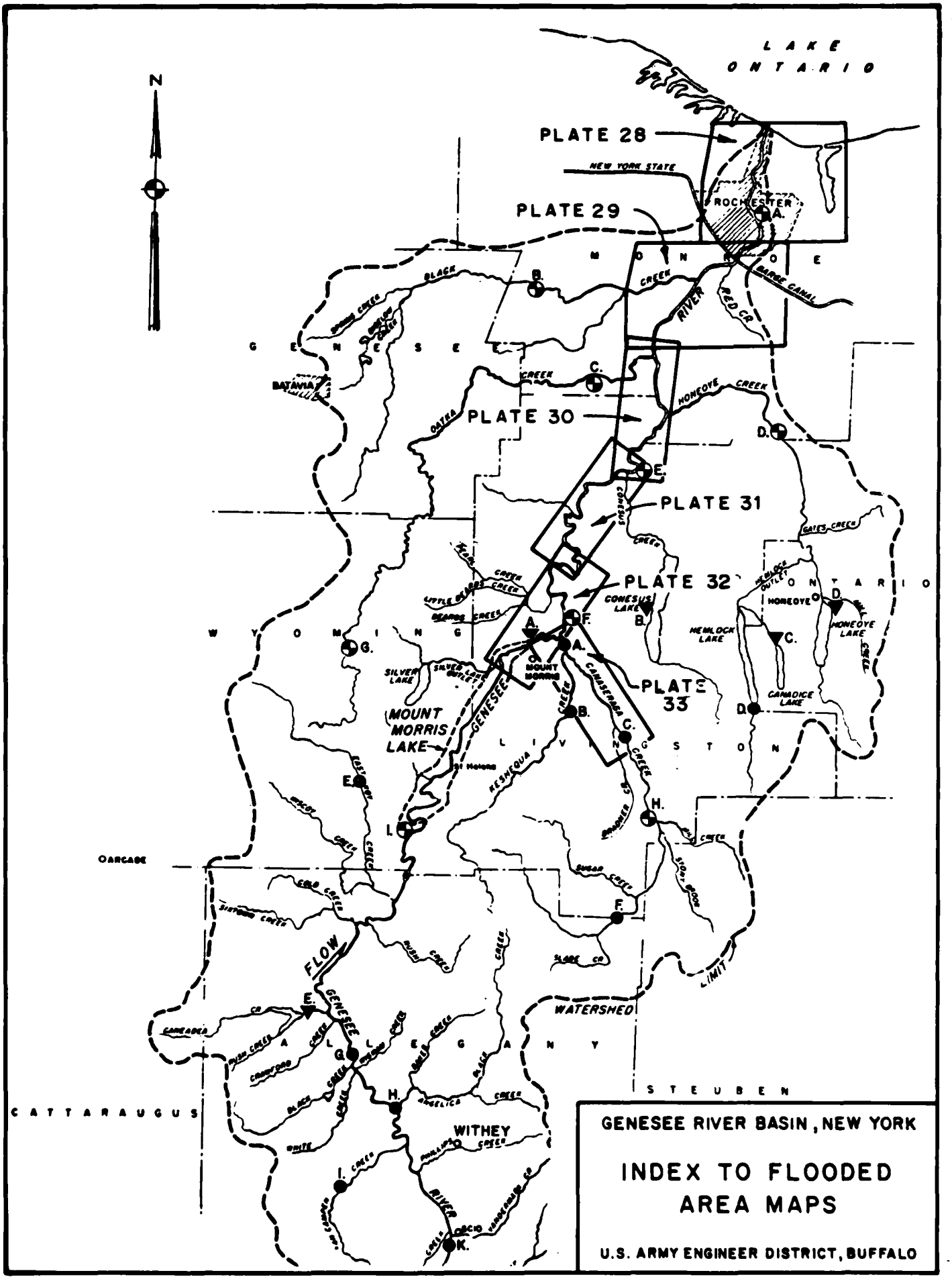
FOR LEGEND SEE PLATE 24

GENESEE RIVER BASIN, NEW YORK

PROFILES
CANASERAGA CREEK
MILE 0.0 TO 10.5

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 26

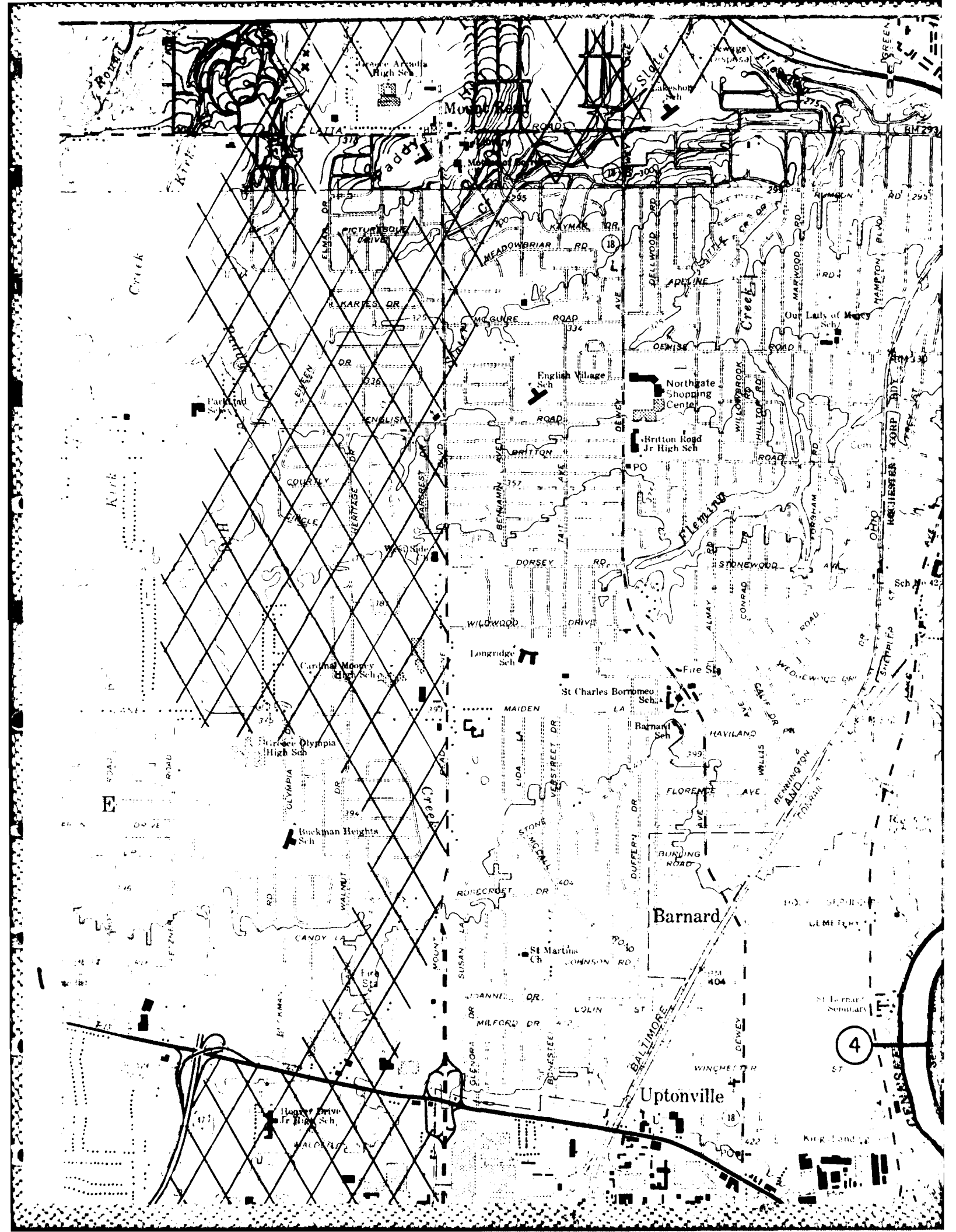


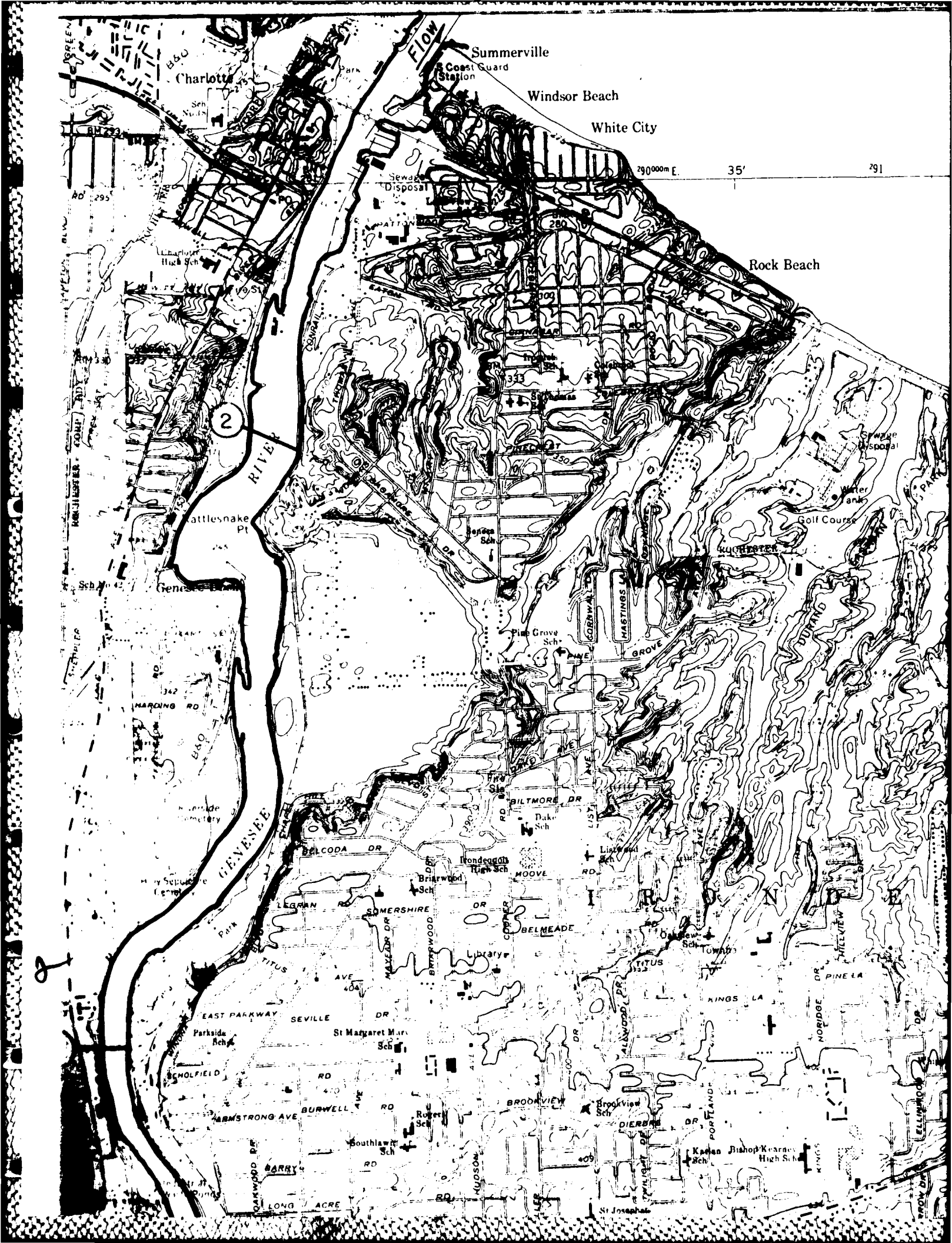
GENESEE RIVER BASIN, NEW YORK

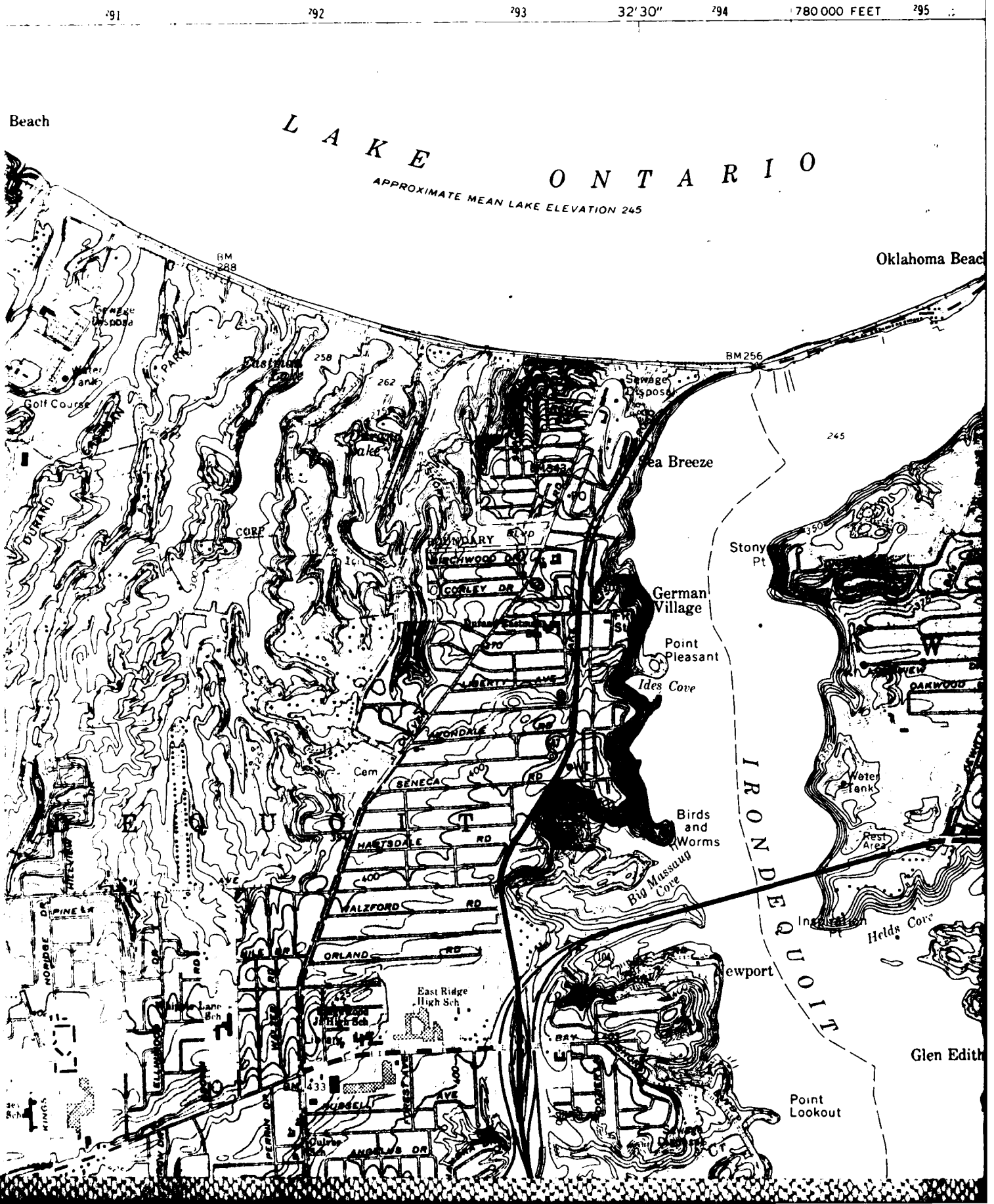
INDEX TO FLOODED AREA MAPS

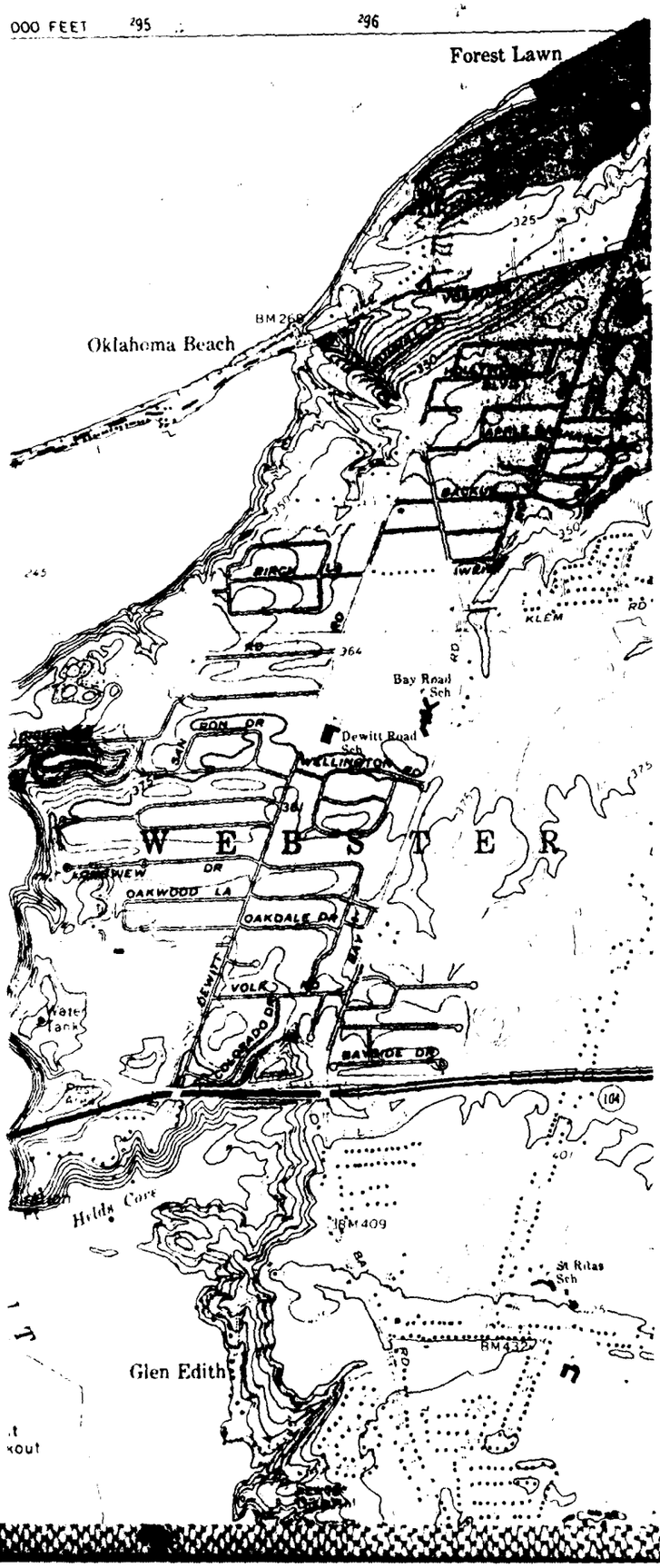
U.S. ARMY ENGINEER DISTRICT, BUFFALO

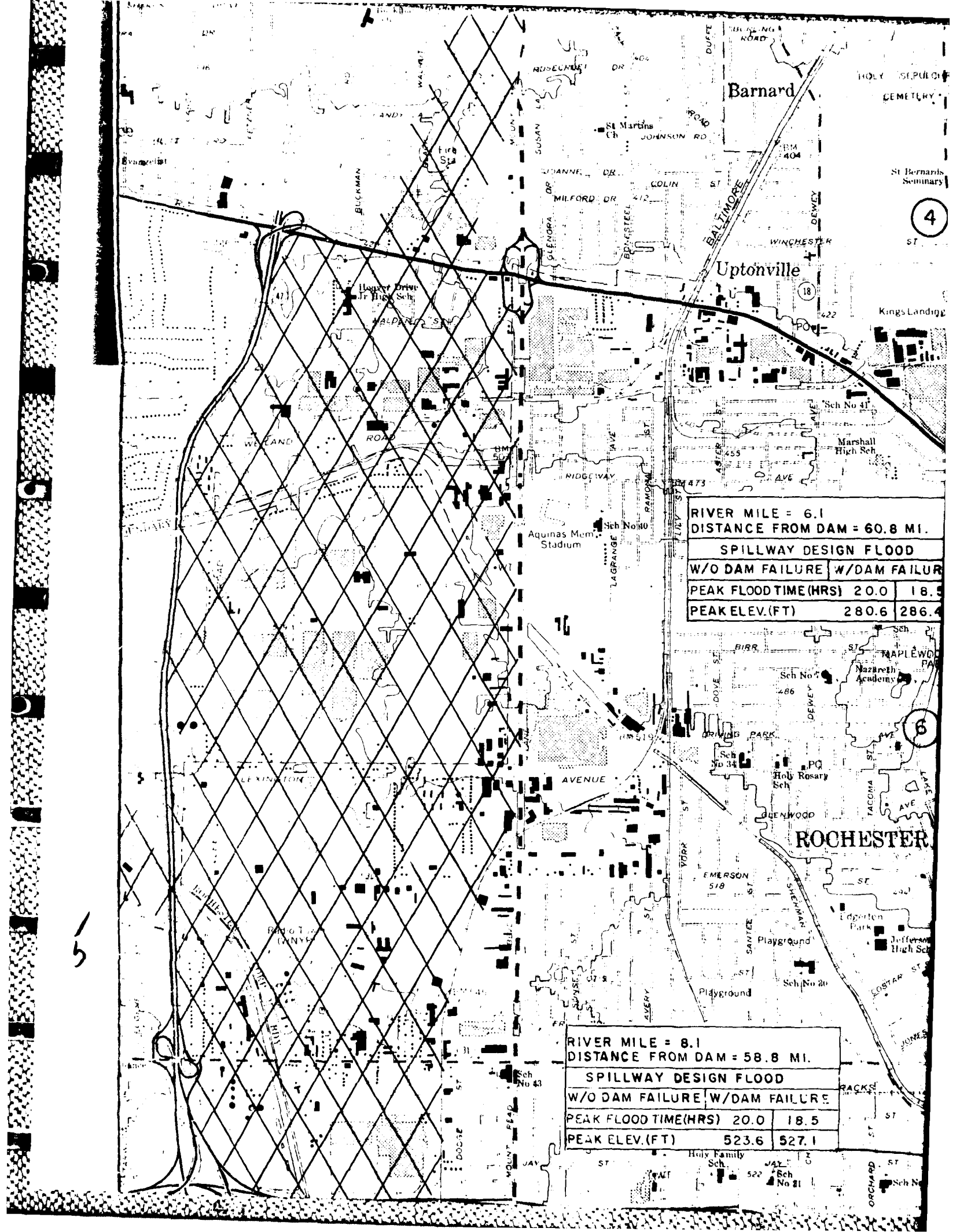
PLATE 27

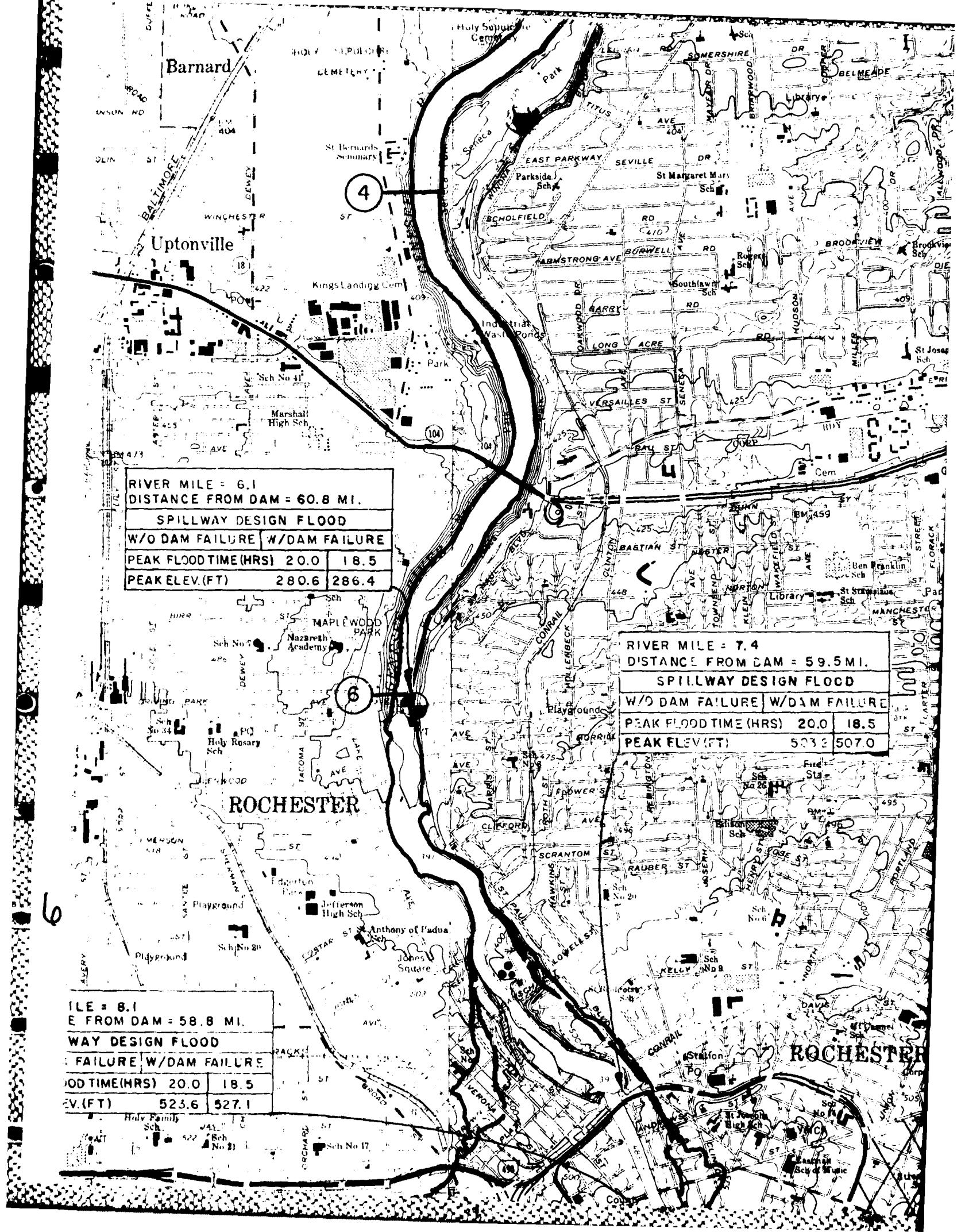

Mount Ararat
Mount Ararat High Sch
Lakeshore Sch
Sluiter
Kirk
Creek
Rose
LATTA
ROAD
BM 293
MEADOWBRIAR RD
KAYMAR DR
ELMAR DR
PICTURESQUE DRIVE
KARTES DR
McGUIRE ROAD
DENISE
APELINE
Our Lady of Mercy Sch
English Village Sch
Northgate Shopping Centre
Britton Road Jr High Sch
BRITTON ROAD
DEWEY
WILLOWBROOK RD
HILLTOP RD
MARWOOD RD
HAMPTON BLVD
Parkland Sch
ENGLISH
EILEEN
COURTLY
CIRCLE
HERITAGE DR
BARGREST BLVD
BENJAMIN AVE
TAIT AVE
DORSEY RD
STONEWOOD AVE
FORSHAM
CONRAD
ALMAY
WILDWOOD DRIVE
Longridge Sch
Cardinal Mooney High Sch
Fire Sta
St Charles Borromeo Sch
MAIDEN LA
Barnard Sch
HAVILAND
FLORENCE AVE
WILLIS
BENNINGTON
Greece Olympia High Sch
OLYMPIA
Buckman Heights Sch
CREEK
WALNUT
STONEWOOD
VERASTREET DR
LIDA
DUFFERN DR
BURDING ROAD
ROSECROFT DR
CANDY LA
MOUNT
SUSAN LA
St Martins Ch
JOHNSON RD
JOANNE DR
COLIN ST
MILFORD DR
GLENORA
BONESTEEL
BALTIMORE
DEWEY
WINCHESTER
Barnard
Uptonville
Hooper Drive Jr High Sch
MALDEN
CEMETERY
St Bernard's Seminary
Kirk Landing
PO
Fire Sta
4
18

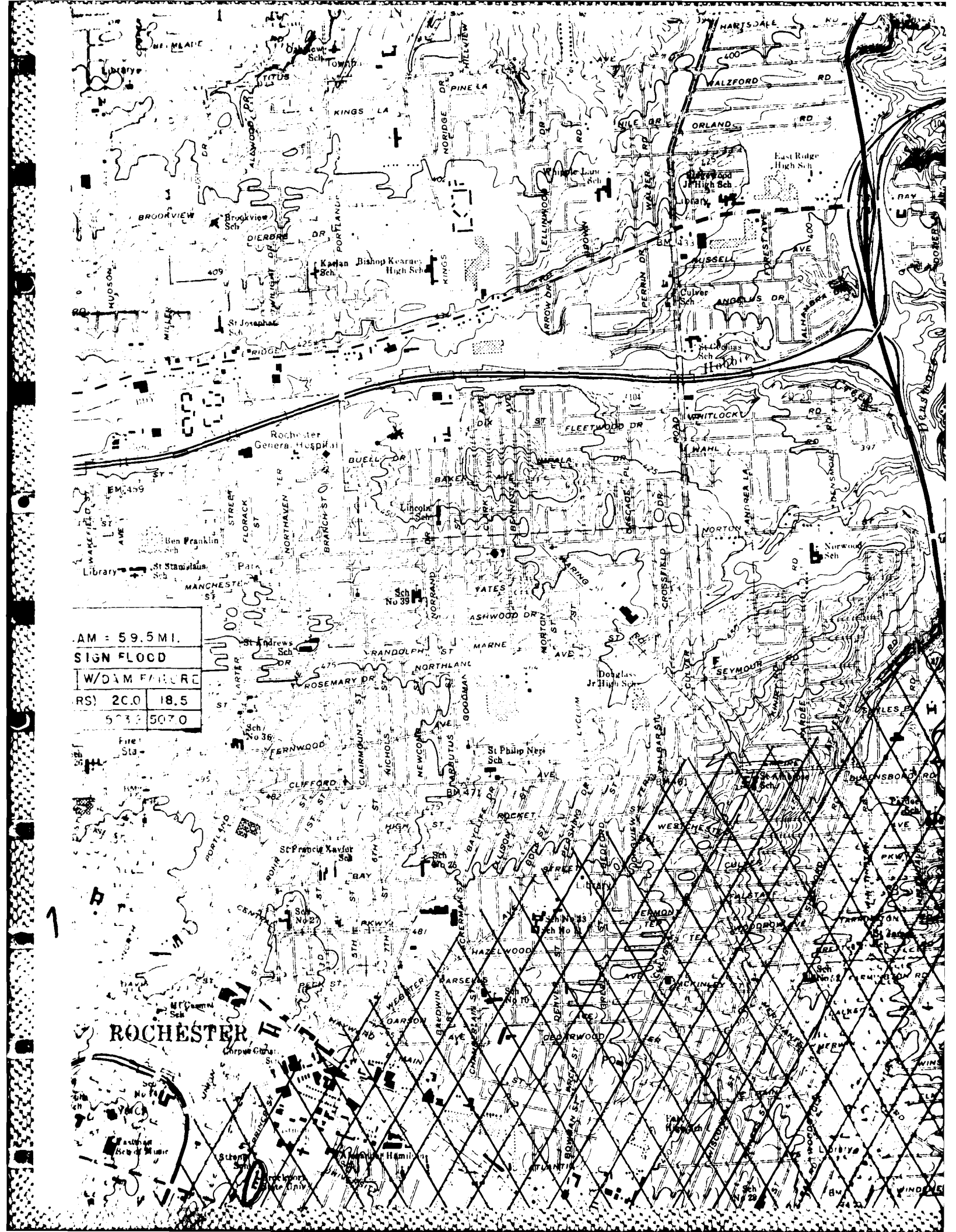

Summerville
Coast Guard Station
Windsor Beach
White City
Rock Beach
Charlotte
Sewage Disposal
Genesee
Rattlesnake Pt
GENESEE RIVER
Golf Course
Pine Grove Sch
Briarwood Sch
Irondequoit High Sch
Dake Sch
Library
Parkside Sch
St Margaret Mary Sch
Rogers Sch
Southlawn Sch
Brookview Sch
Bishop Kearney High Sch
St Josaphat
IRONDEQUOIT
BELMEADE
SOMERSHIRE
SEVILLE
BURWELL RD
BROOKVIEW
DIERBERG
BILTMORE
TITUS
HARDING RD
LEGRAN
MAYFAIR DR
KINGS LA
PINE LA
HILLVIEW
NORIDGE
ELLINWOOD
PORTLAND
HASTINGS
CORNWALL
DURAND
GROVE
BELCODA DR
SCHOLFIELD RD
ARMSTRONG AVE
LONG ACRE
BARRY
OAKWOOD DR
HUDSON
ALLWOOD PR
CONRAIL
B&O
290000m E.
35'
291

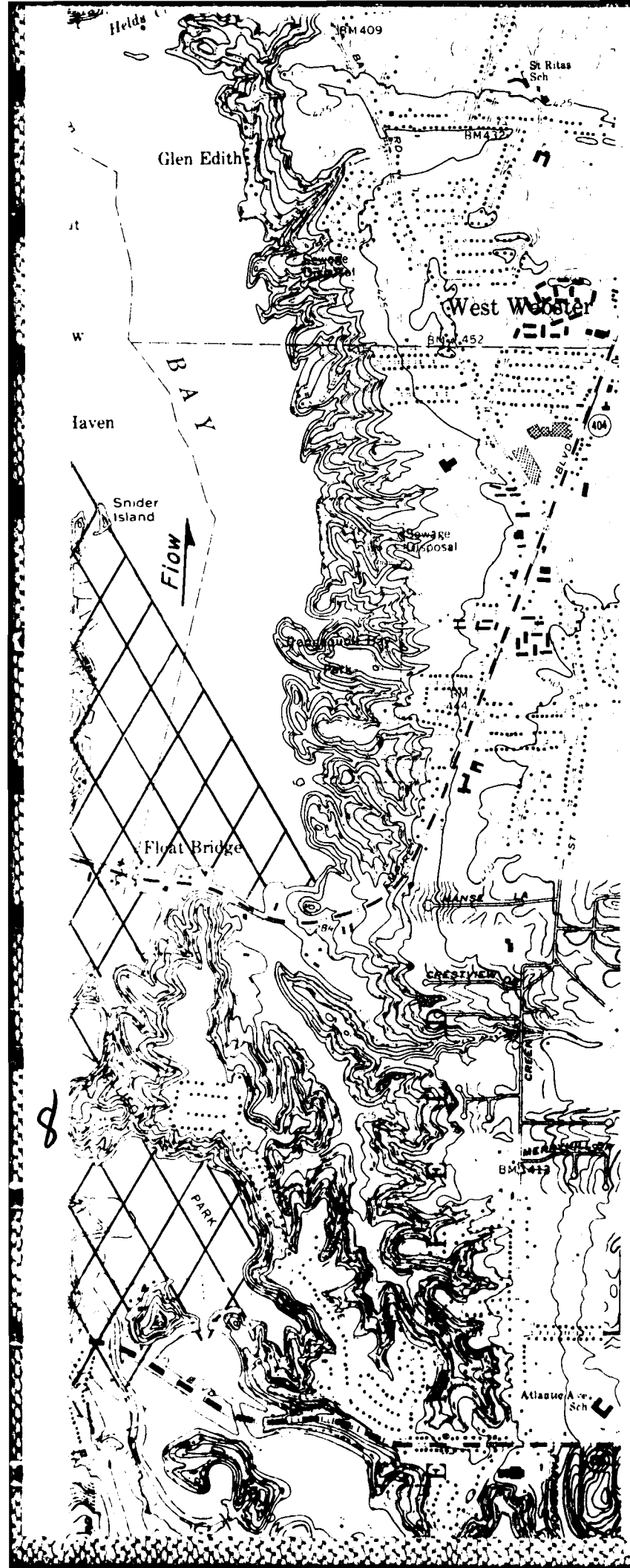

781 000 FEET
782
783
32°30"
784
785
Beach
LAKE ONTARIO
APPROXIMATE MEAN LAKE ELEVATION 245
BM 288
BM 256
Oklahoma Beach
Golf Course
Sewage Disposal
Sea Breeze
Stony Pt
German Village
Point Pleasant
Ides Cove
Birds and Worms
Big Massaug Cove
Water Tanks
Rest Area
Helds Cove
Newport
Glen Edith
Point Lookout
IRONDEQUOIT
East Ridge High Sch
Cem
BOULEVARD
CORLEY DR
LIBERTY AVE
SENECA RD
HASTSDALE RD
WALZFORD RD
ORLAND RD
OAKWOOD
3


000 FEET
295
296
Forest Lawn
Oklahoma Beach
BM 268
325
350
BIRCH LA
KLEM RD
364
Bay Road Sch
Dewitt Road Sch
RON DR
WELLINGTON RD
WEBSTER
ACORNVIEW DR
OAKWOOD LA
OAKDALE DR
DEWITT RD
VOLK RD
Water Tank
BAYSIDE DR
104
Holly Cove
BM 409
St Rita's Sch
Glen Edith
BM 432
N


Barnard
Uptonville
ROCHESTER
Aquinas Mem. Stadium
Sch No 30
Sch No 41
Marshall High Sch
Sch No 34
Holy Rosary Sch
Nazareth Academy
Sch No 43
Holy Family Sch.
Sch No 31
Playground
Edgerton Park
Jefferson High Sch
St Martins Ch
St Bernards Seminary
Kings Landing
Harper Drive Jr High Sch
Fire Sta
PO
BM 404
BM 473
BM 519
BM 522
RIVER MILE = 6.1
DISTANCE FROM DAM = 60.8 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILUR
PEAK FLOOD TIME (HRS) 20.0 | 18.5
PEAK ELEV. (FT) 280.6 | 286.4
RIVER MILE = 8.1
DISTANCE FROM DAM = 58.8 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME (HRS) 20.0 | 18.5
PEAK ELEV. (FT) 523.6 | 527.1


Barnard
Uptonville
ROCHESTER
ROCHESTER
RIVER MILE = 6.1
DISTANCE FROM DAM = 60.8 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME (HRS) 20.0 | 18.5
PEAK ELEV. (FT) 280.6 | 286.4
RIVER MILE = 7.4
DISTANCE FROM DAM = 59.5 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME (HRS) 20.0 | 18.5
PEAK ELEV (FT) 503.3 | 507.0
ILE = 8.1
E FROM DAM = 58.8 MI.
WAY DESIGN FLOOD
FAILURE | W/DAM FAILURE
OD TIME(HRS) 20.0 | 18.5
EV.(FT) 523.6 | 527.1
4
6
6


AM = 59.5 MI.
SIGN FLOOD
W/DAM FAILURE
RS) 20.0 18.5
5070
ROCHESTER
Rochester General Hospital
Ben Franklin Sch
St Stanislaus Sch
Lincoln Sch
Sch No 39
St Andrews Sch
Sch No 36
St Philip Neri Sch
St Francis Xavier Sch
Sch No 26
Sch No 27
Sch No 33
Sch No 10
Sch No 29
Douglass Jr High Sch
Norwood Sch
Culver Sch
Douglas Sch
Brookview Sch
Kaplan Sch
Bishop Kearney High Sch
St Josephat Sch
Dake Jr High Sch
Charlotte High Sch
East Rochester High Sch
Library
Fire Sta
Corpus Christi
Mt Carmel Sch
Brown Square
Strong
Rochester Inst Tech
Alexander Hamilton
Harbor
Park
Pine La
Kings La
Fleetwood Dr
Yates
Ashwood Dr
Fernwood
Clifford
Rosemary Dr
Randolph St
Northland
Hazelwood
Oakwood
Main
Buell Dr
Baker Ave
Manchester St
Norton
Seymour
Culver
Westchester
Buensboro Rd
Whitlock
Walzford Rd
Orland Rd
Russell
Portland
Brookview
Dierbrg Dr
Kings
Pinnacle Lane Sch
Elmwood Jr High Sch
Library
Lake Ontario
Bay
Genesee River
Erie Canal



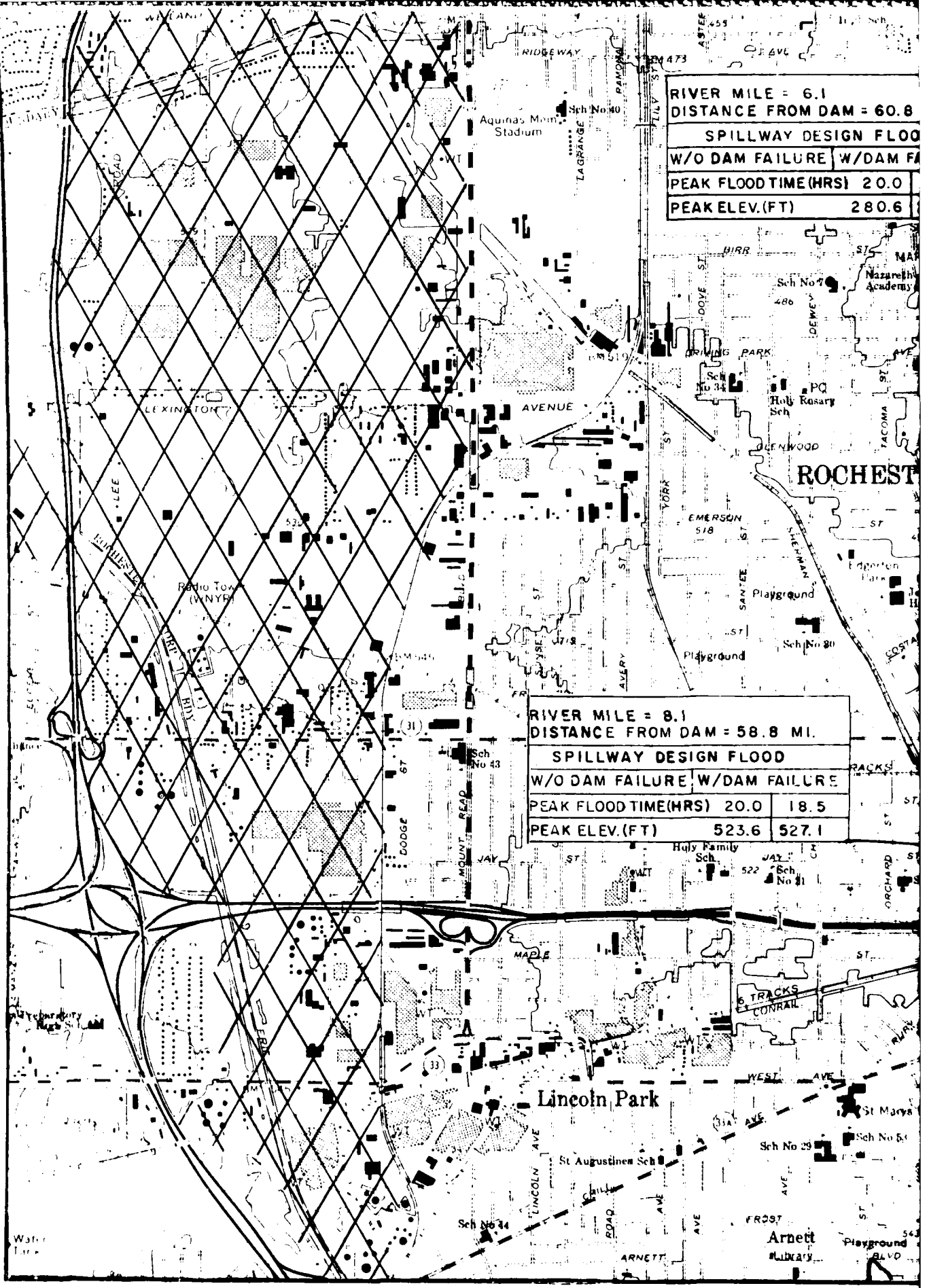
N

SCALE OF MILES

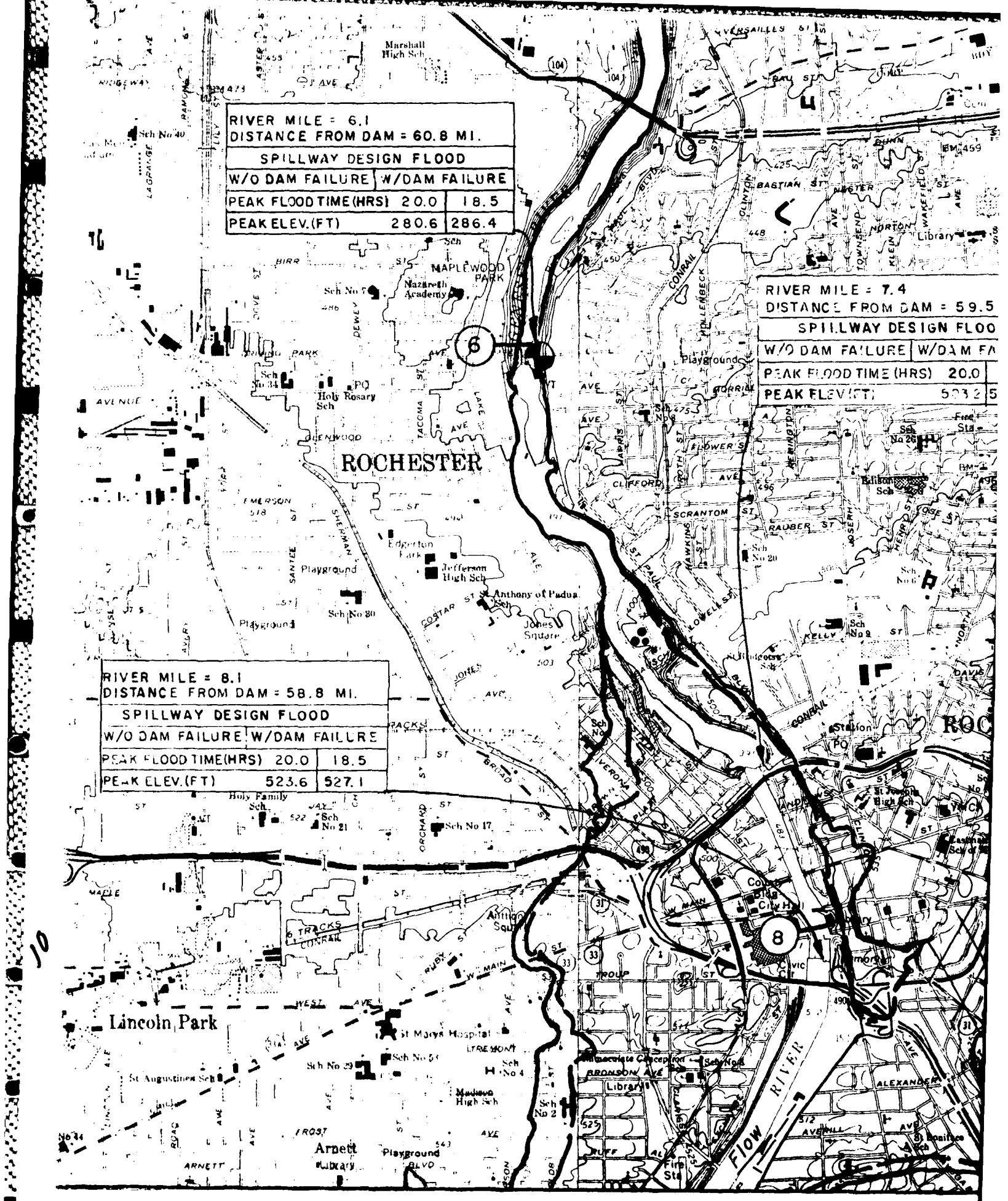
0 1/2 1

LEGEND:

- U.S.G.S. RECORDING GAGE
- I.P.2 INDEX POINT REACH 2
- PROBABLE MAXIMUM FLOODED AREA WITH DAM FAILURE.
- PROBABLE MAXIMUM FLOODED AREA WITHOUT DAM FAILURE.
- APPROXIMATE OVERLAND FLOODING FOR PROBABLE MAXIMUM FLOOD WITH OR WITHOUT DAM FAILURE.


RIVER MILE = 6.1
DISTANCE FROM DAM = 60.8
SPILLWAY DESIGN FLOO
W/O DAM FAILURE | W/DAM FA
PEAK FLOOD TIME (HRS) 20.0
PEAK ELEV. (FT) 280.6
RIVER MILE = 8.1
DISTANCE FROM DAM = 58.8 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME (HRS) 20.0 | 18.5
PEAK ELEV. (FT) 523.6 | 527.1
ROCHEST
Lincoln Park
Aquinas Mem. Stadium
Sch No 40
Sch No 7
Nazareth Academy
Sch No 34
PC Holy Rosary Sch
Playground
Sch No 80
Sch No 43
Holy Family Sch.
Sch No 11
Radio Tower (WNYR)
St Augustines Sch
Sch No 44
Arnett Library
Playground
6 TRACKS CONRAIL
RIDGEWAY
LEXINGTON AVENUE
EMERSON
MOUNT READ BLVD
DODGE
LINCOLN AVE
FROST AVE
ARNETT BLVD
WEST AVE
MAPLE ST
ORCHARD ST
SHERMAN ST
TACOMA ST
DEWEY AVE
AVERY ST
LEE ROAD
LAGRANGE ST
PAMONA ST
ASTER AVE
BIRR ST
DRIVING PARK AVE
YORK ST
SANTEE ST
ULYSSES ST
JAY ST
MAPLE ST
518
522
486
519
530
473

9

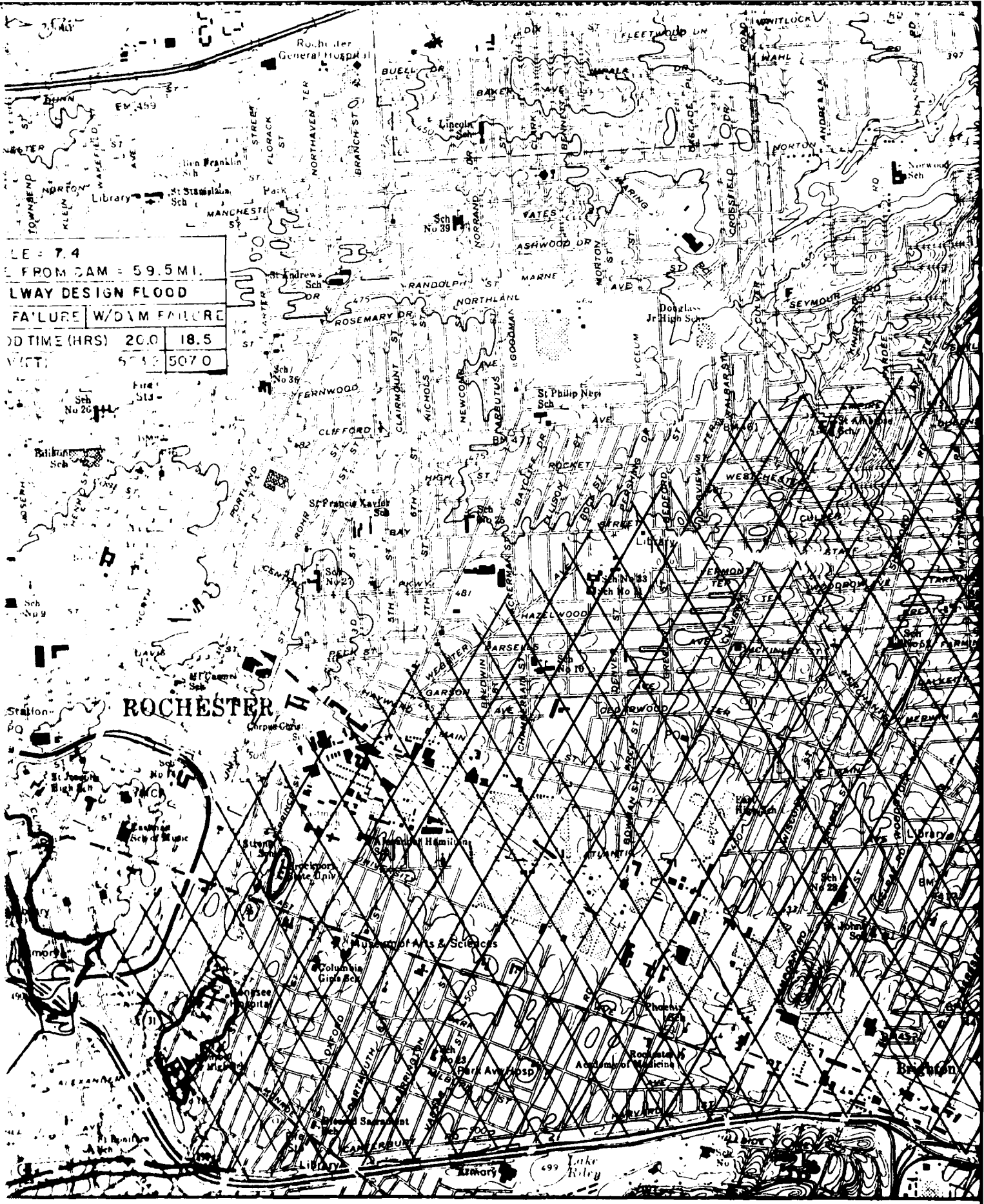


RIVER MILE = 6.1 DISTANCE FROM DAM = 60.8 MI.		
SPILLWAY DESIGN FLOOD		
	W/O DAM FAILURE	W/DAM FAILURE
PEAK FLOOD TIME (HRS)	20.0	18.5
PEAK ELEV. (FT)	280.6	286.4

RIVER MILE = 7.4 DISTANCE FROM DAM = 59.5		
SPILLWAY DESIGN FLOO		
	W/O DAM FAILURE	W/DAM FA
PEAK FLOOD TIME (HRS)	20.0	
PEAK ELEV (FT)	503.2	5

RIVER MILE = 8.1 DISTANCE FROM DAM = 58.8 MI.		
SPILLWAY DESIGN FLOOD		
	W/O DAM FAILURE	W/DAM FAILURE
PEAK FLOOD TIME (HRS)	20.0	18.5
PEAK ELEV. (FT)	523.6	527.1

10


LE = 7.4
FROM DAM = 59.5 MI.
LWAY DESIGN FLOOD
FAILURE | W/D\M FAILURE
OD TIME (HRS) 20.0 | 18.5
ROCHESTER
Rochester General Hospital
Lincoln Sch
Douglass Jr High Sch
St Andrews Sch
St Philip Neri Sch
St Francis Xavier Sch
Library
Museum of Arts & Sciences
Columbia Girls Sch
Phoenix Sch
Lake Riley

LEGEND:

U.S.G.S. RECORDING GAGE

I.P.2 INDEX POINT REACH 2

PROBABLE MAXIMUM FLOODED AREA WITH DAM FAILURE.

PROBABLE MAXIMUM FLOODED AREA WITHOUT DAM FAILURE.

APPROXIMATE OVERLAND FLOODING FOR PROBABLE MAXIMUM FLOOD WITH OR WITHOUT DAM FAILURE.

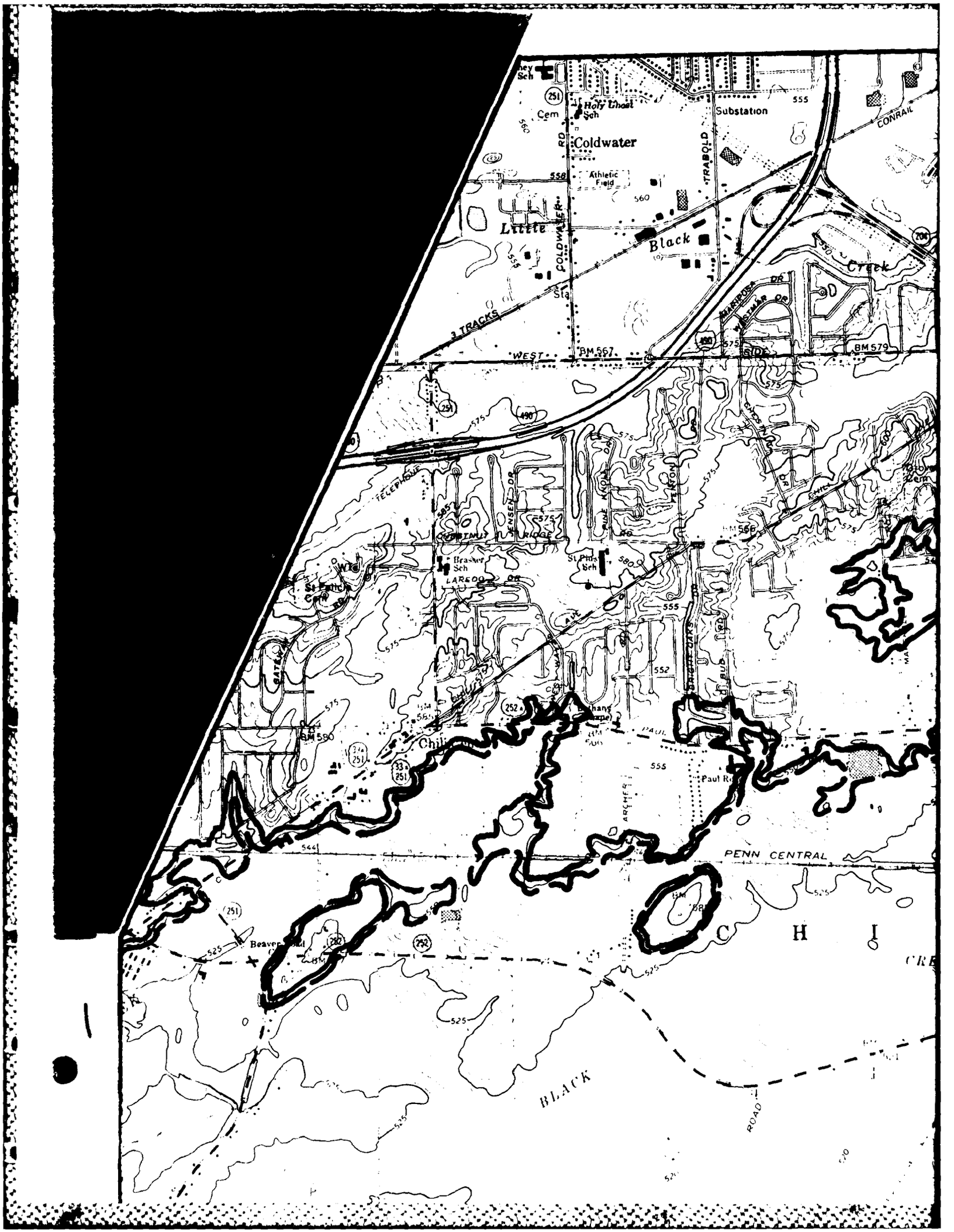
GENESEE RIVER BASIN, NEW YORK

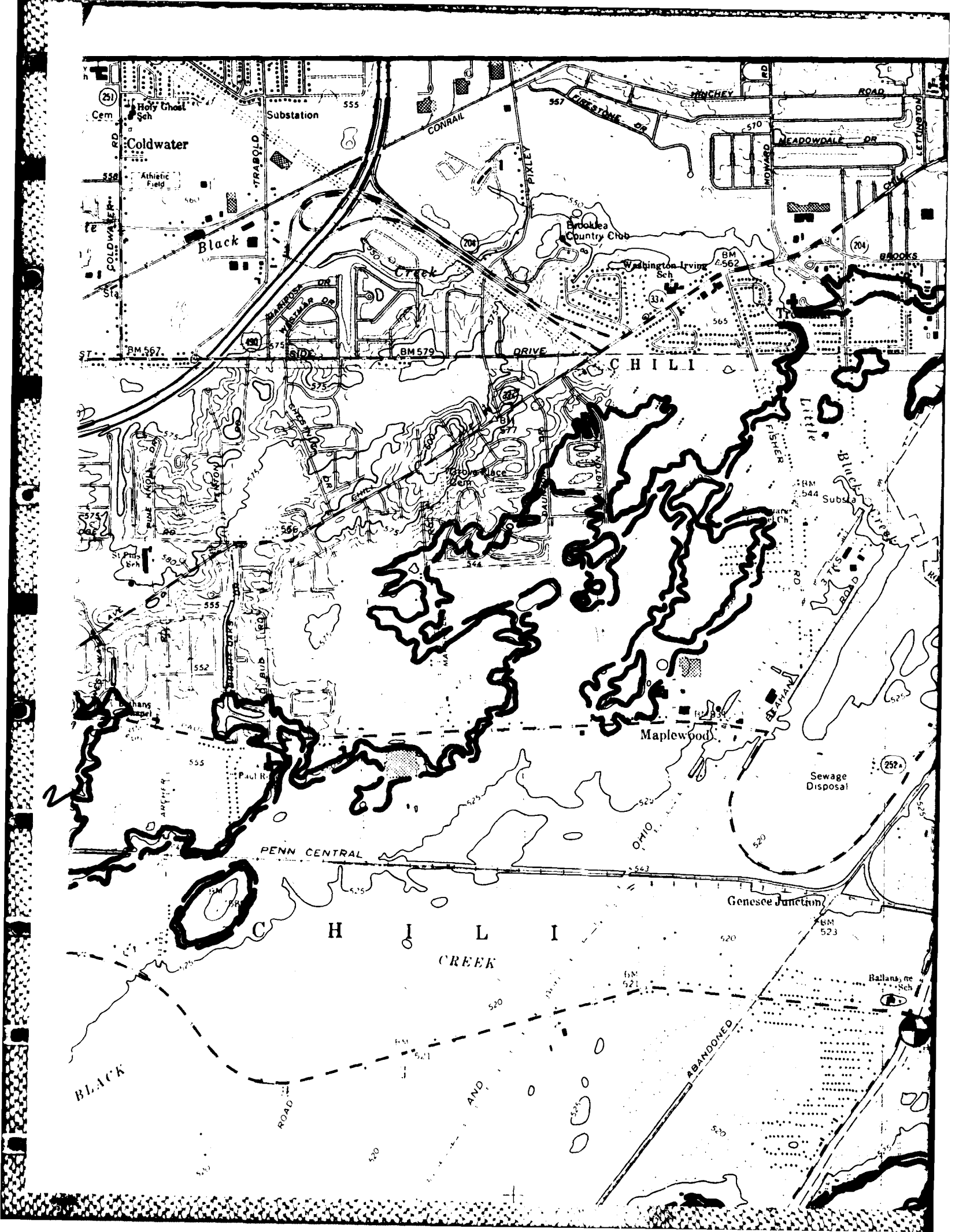
ROCHESTER

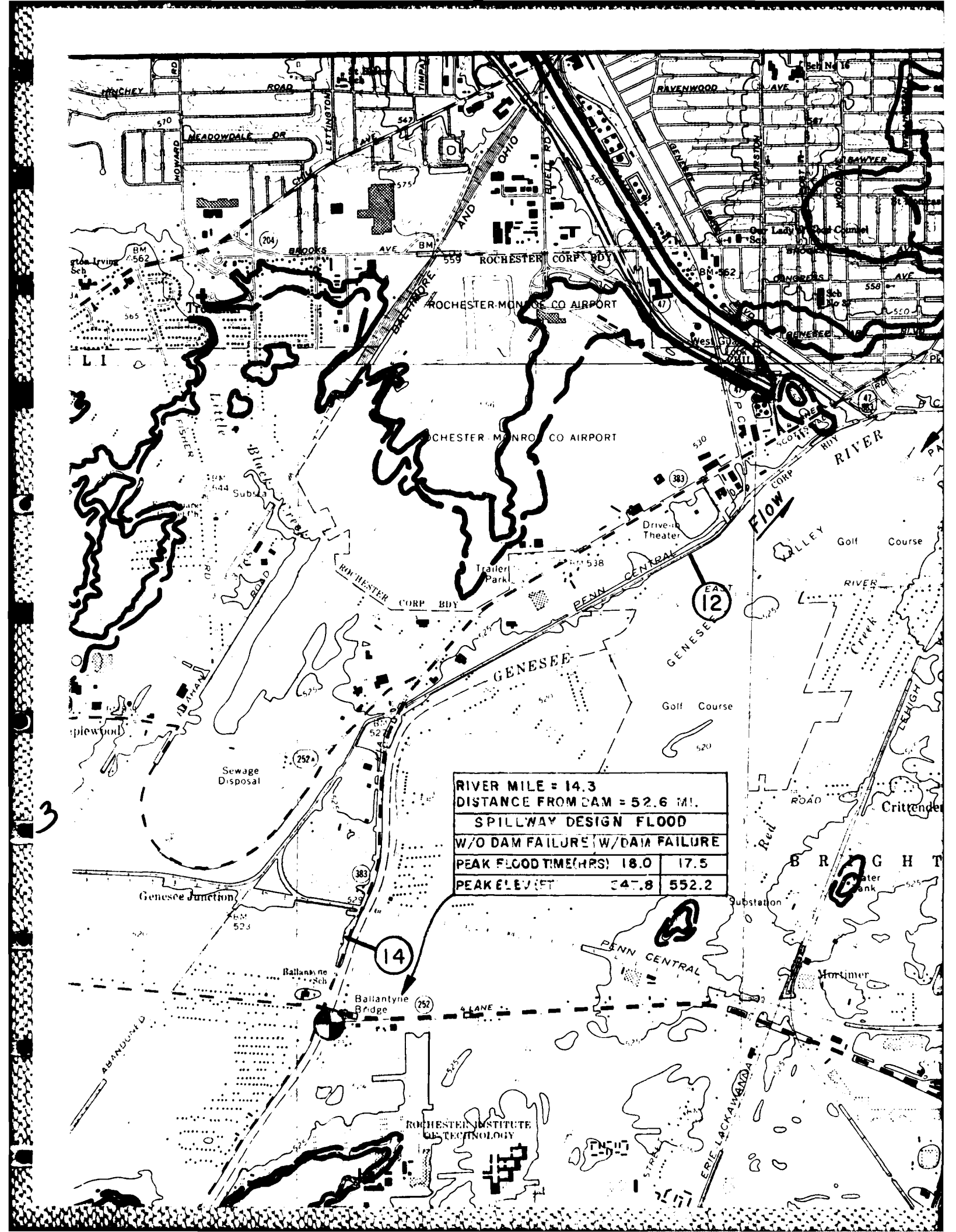
FLOODED AREAS

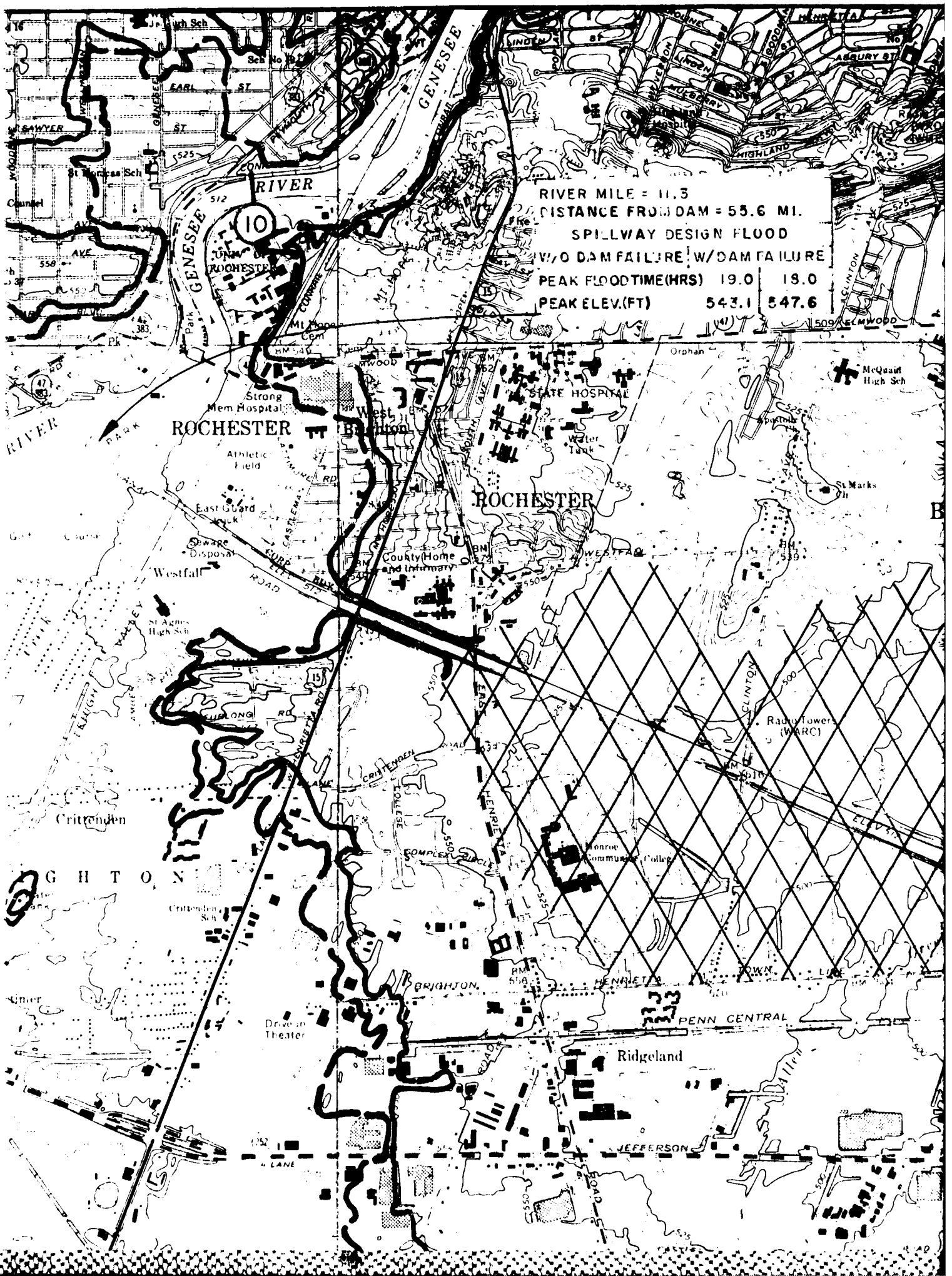
U.S. ARMY ENGINEER DISTRICT, BUFFALO

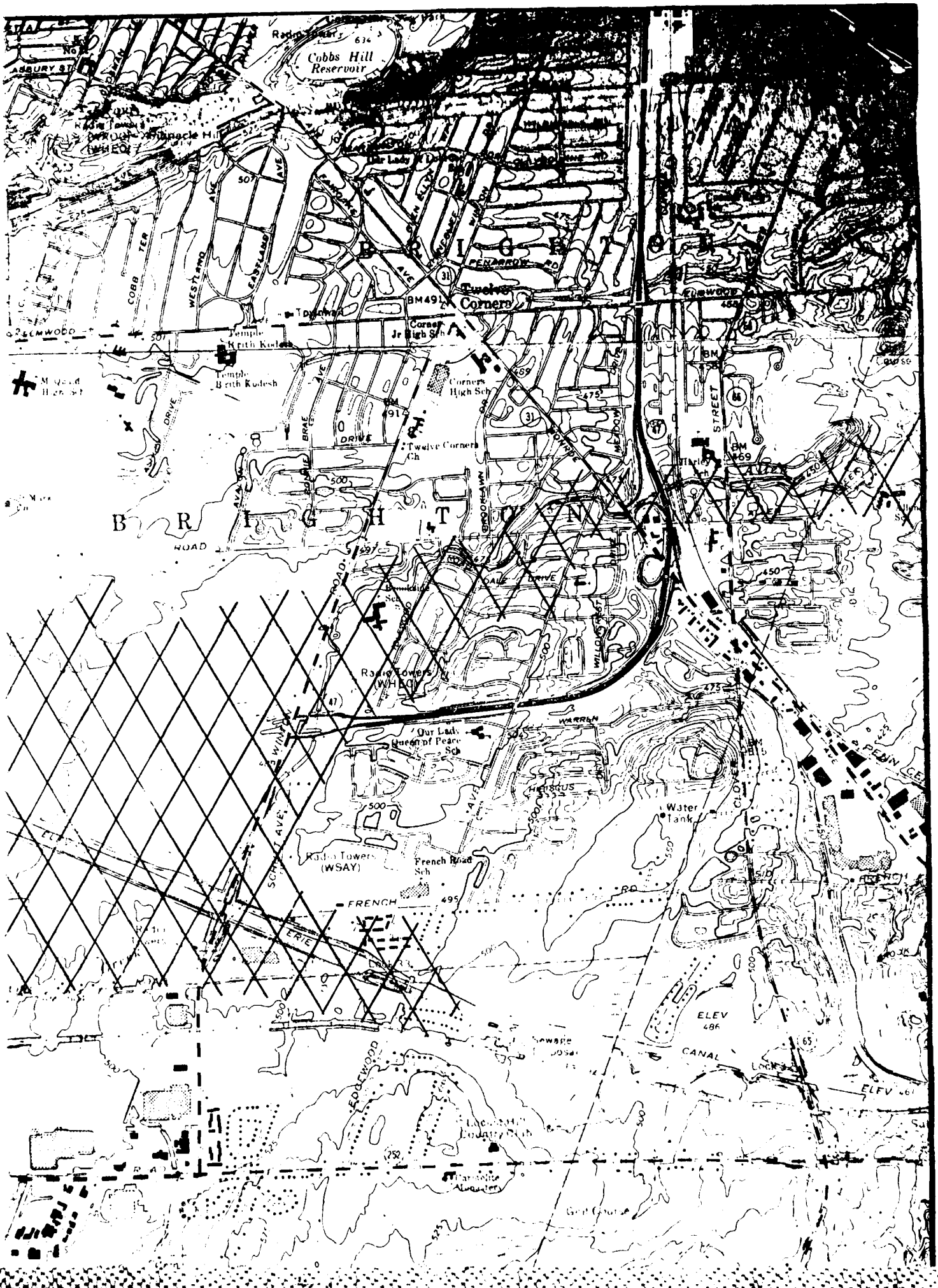
PLATE 28

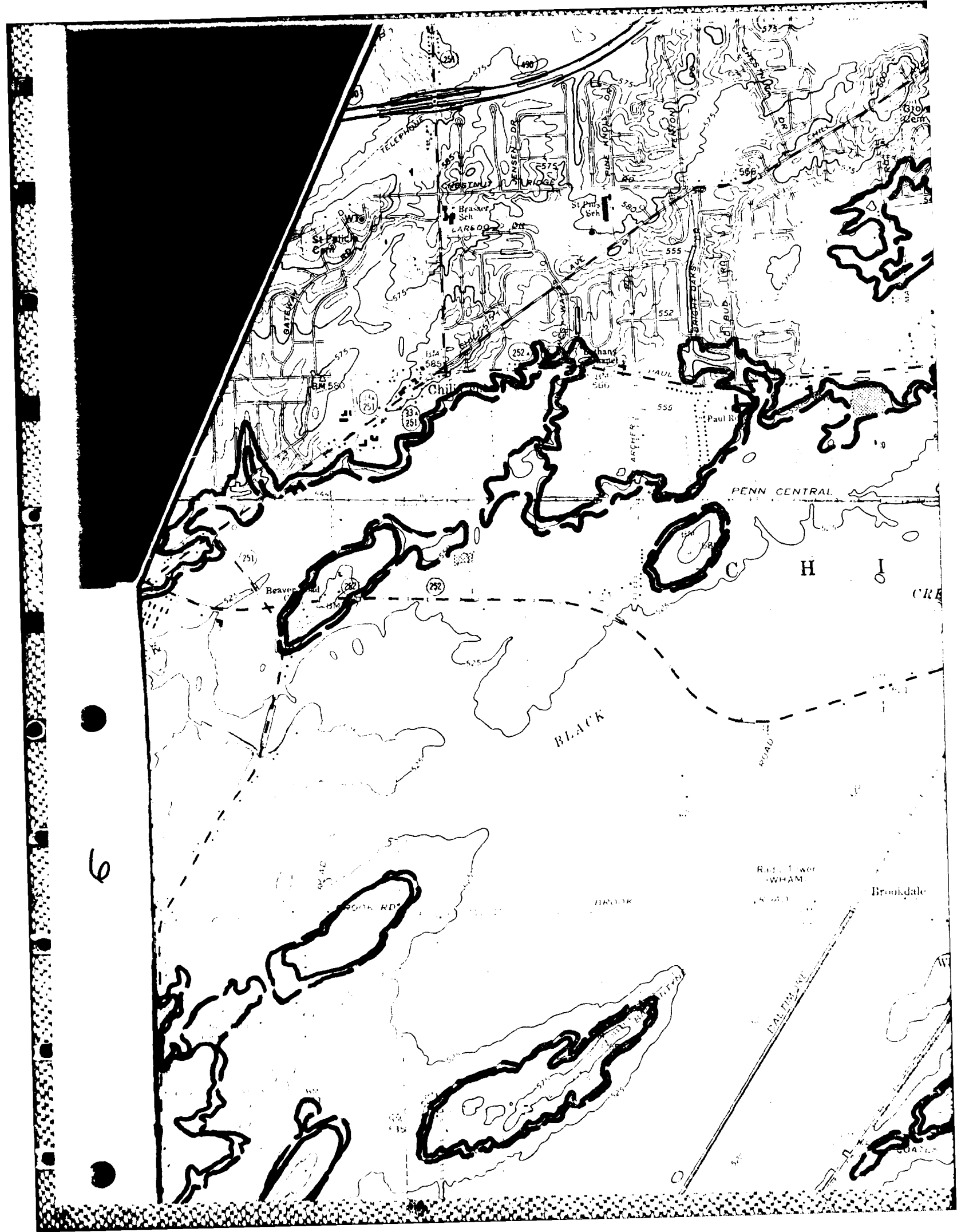

Coldwater
Holy Ghost Sch
Cem
Substation
CONRAIL
Athletic Field
Little
Black
Creek
3 TRACKS
WEST
BM 567
BM 579
SIDE
TELEPHONE
Brasher Sch
St Paul's Sch
St Paul's Cem
LAREDO DR
PENN CENTRAL
Paul Rd
BLACK
ROAD
Beaver
C H I

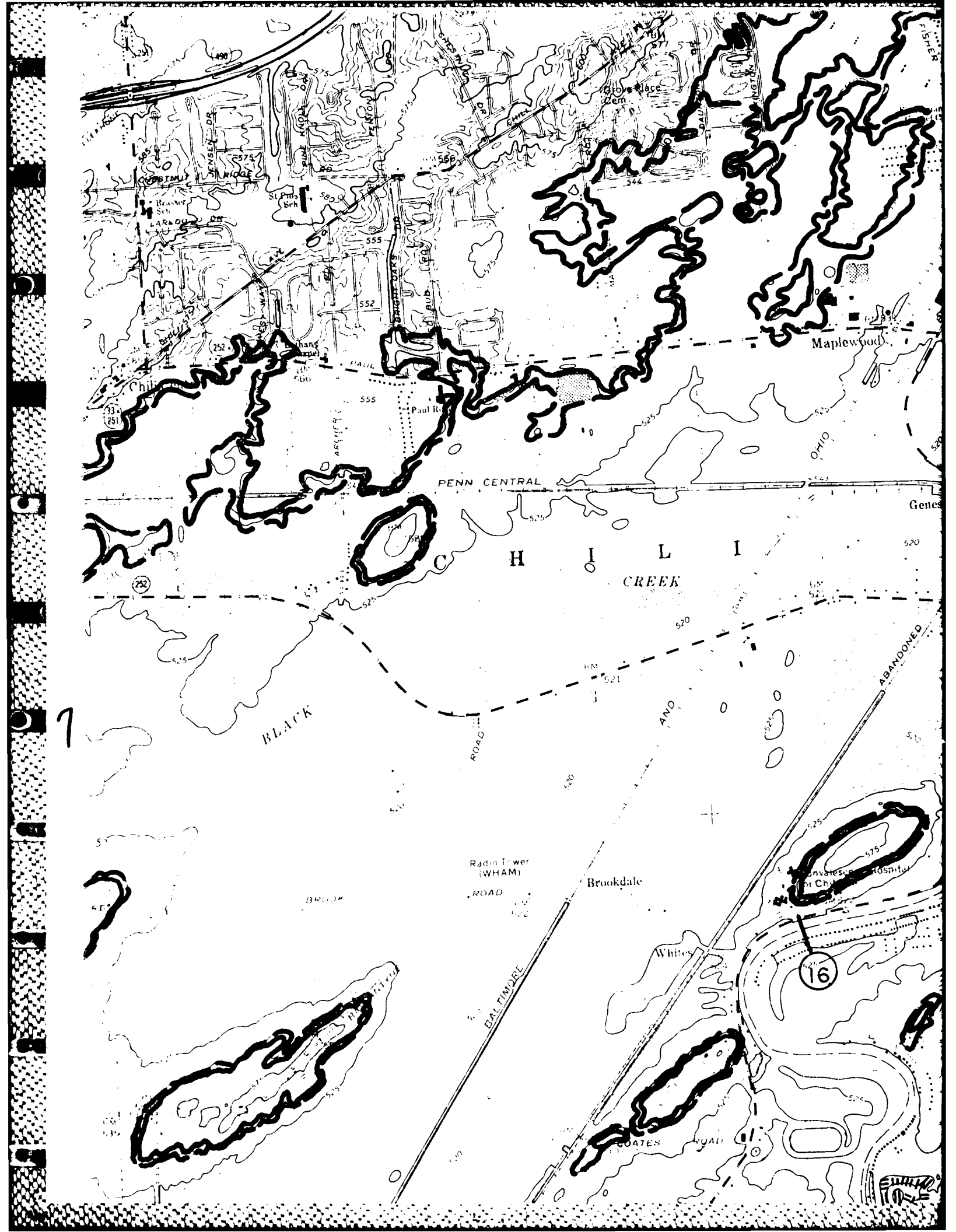

Coldwater
Holy Ghost Sch
Substation
Athletic Field
Black
Creek
CONRAIL
FIXLEY
TRABOLD
COLDWATER
MANCHEY
ROAD
FIRESTONE DR
MEADOWDALE DR
LETTINGTON
MOWARD
Brookdale Country Club
Washington Irving Sch
BM 562
BROOKS
MARIPOSA DR
WESTAR DR
BM 567
BM 579
SIDE
DRIVE
CHILI
Little
FISHER
Bluck
Creek
Stone Place
Dem
BM 544
Substa
PINE KNOLL DR
St Pats Sch
DAUGHTON
3 TIS
ROAD
Maplewood
Sewage Disposal
PENN CENTRAL
OHIO
Genesee Junction
BM 523
CREEK
BM 521
Ballantyne Sch
BLACK
ROAD
AND
ABANDONED

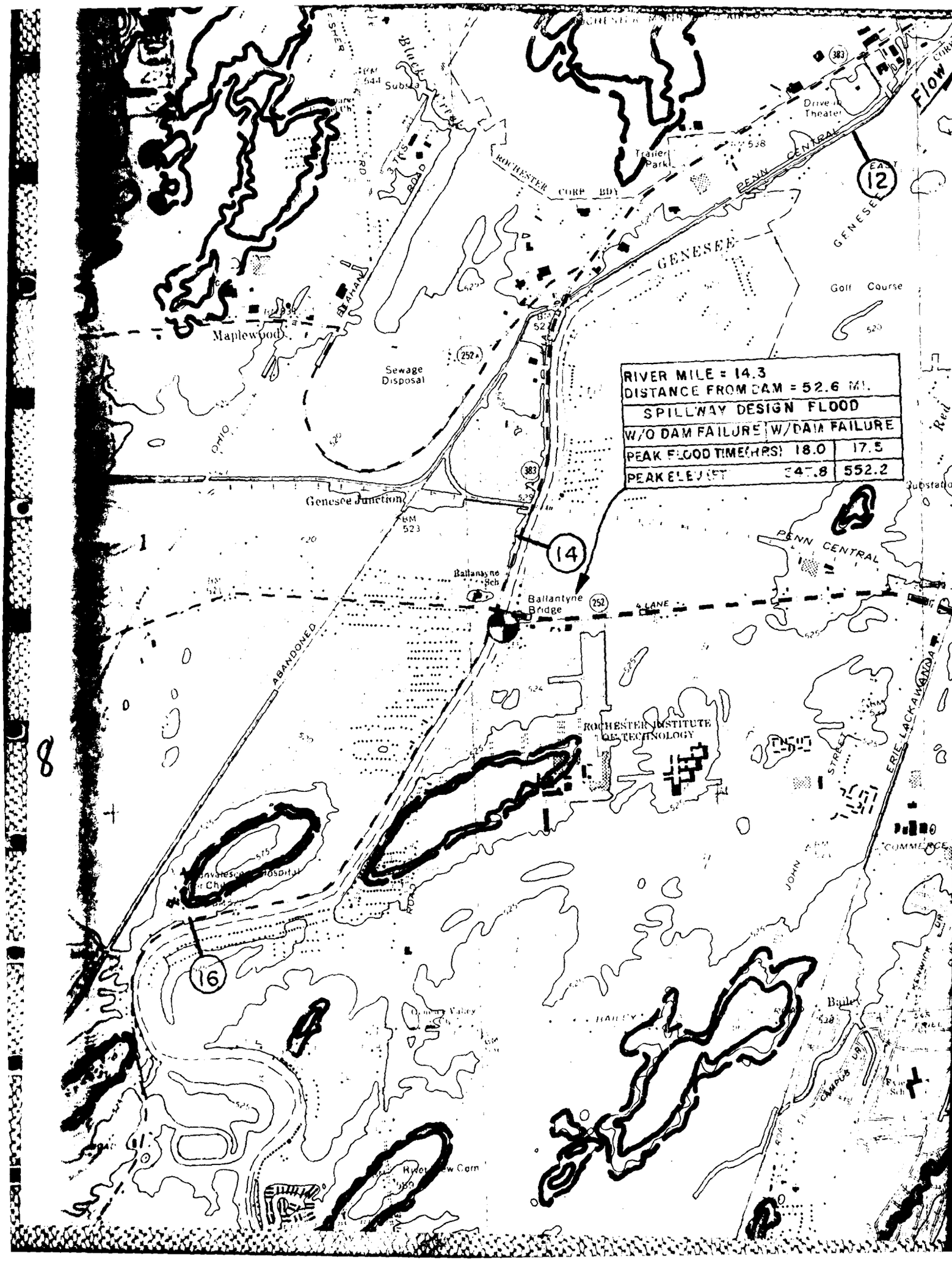

RIVER MILE = 14.3
DISTANCE FROM DAM = 52.6 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME(HRS) 18.0 | 17.5
PEAK ELEV (FT) 547.8 | 552.2
ROCHESTER-MONROE CO AIRPORT
ROCHESTER CORP BDY
PENN CENTRAL
GENESEE
Golf Course
Sewage Disposal
Genesee Junction
Ballantyne Bridge
Ballantyne Sch
ROCHESTER INSTITUTE OF TECHNOLOGY
ERIE-LACKAWANNA
Drive-in Theater
Trailer Park
Substation
Mortimer
Crittenden
BRIGHT
Flow
RIVER
Little Black Creek
Red Creek
BROOKS AVE
MEADOWDALE DR
RAVENWOOD AVE
LETTINGTON AVE
BATAVIA
OHIO
TIMPANY
HOWARD
FISHER
GENESEE
SCOTTSVILLE RD
ROCHESTER CORP BDY
PENN CENTRAL
4 LANE
ABANDONED
12
14
383
252
47
BM 562
BM 559
BM 544
BM 538
BM 523

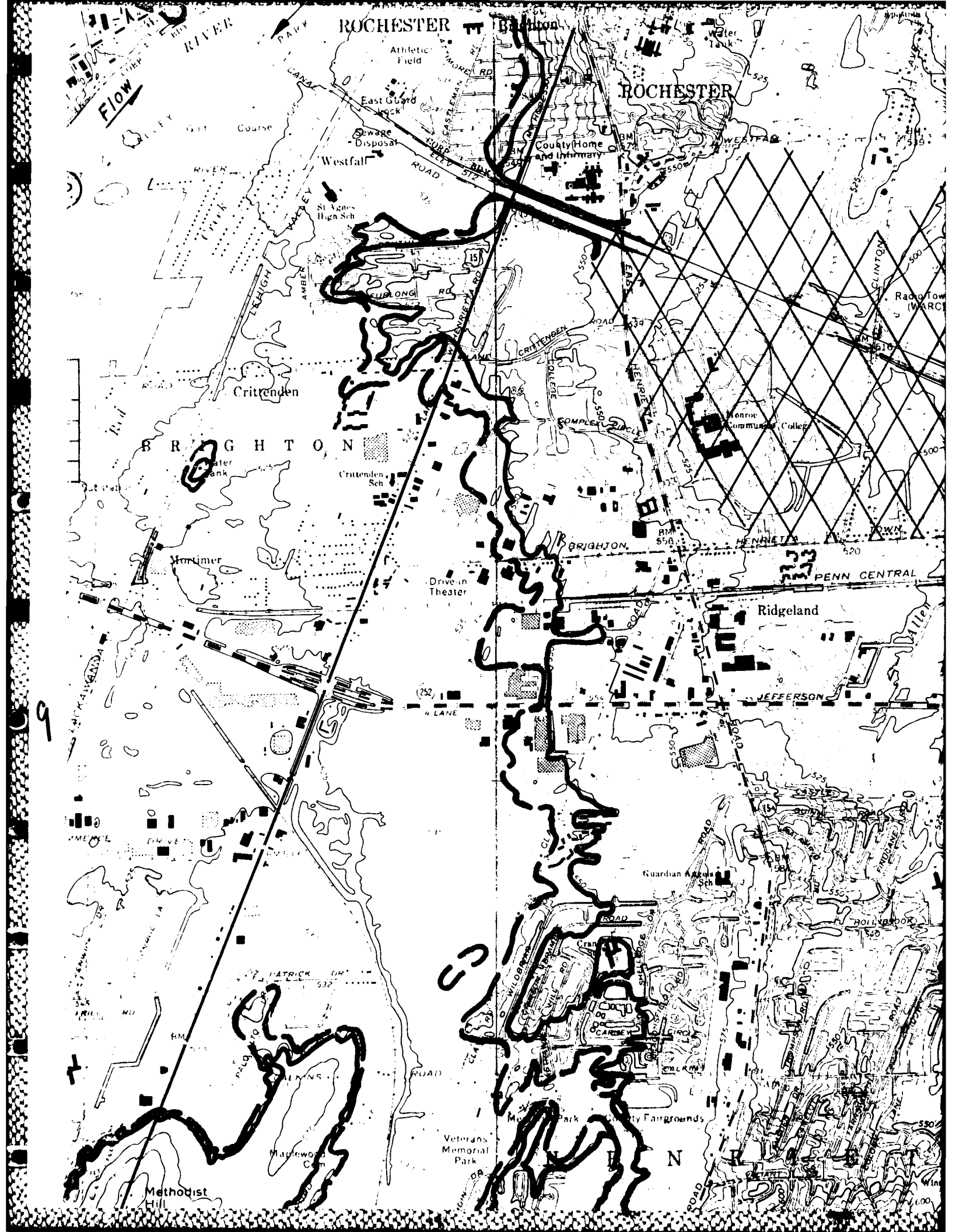

RIVER MILE = 11.3
DISTANCE FROM DAM = 55.6 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/ DAM FAILURE
PEAK FLOOD TIME (HRS) 19.0 | 18.0
PEAK ELEV. (FT) 543.1 | 547.6
ROCHESTER
GENESEE RIVER
Strong Mem Hospital
West Brighton
STATE HOSPITAL
Athletic Field
East Guard Lock
Seware Disposal
Westfall
County Home and Infirmary
St Agnes High Sch
McQuaid High Sch
Water Tank
St Marks
Radio Tower (WARC)
Crittenden
Monroe Community College
Drive-in Theater
BRIGHTON
PENN CENTRAL
Ridgeland
JEFFERSON
HENRIETTA
CLINTON
MT HOPE
ELMWOOD
HIGHLAND
MAPLE
MULBERRY
ASBURY ST
EARL ST
SAWYER
PARK
AVE
ROAD
LANE
TOWN LINE

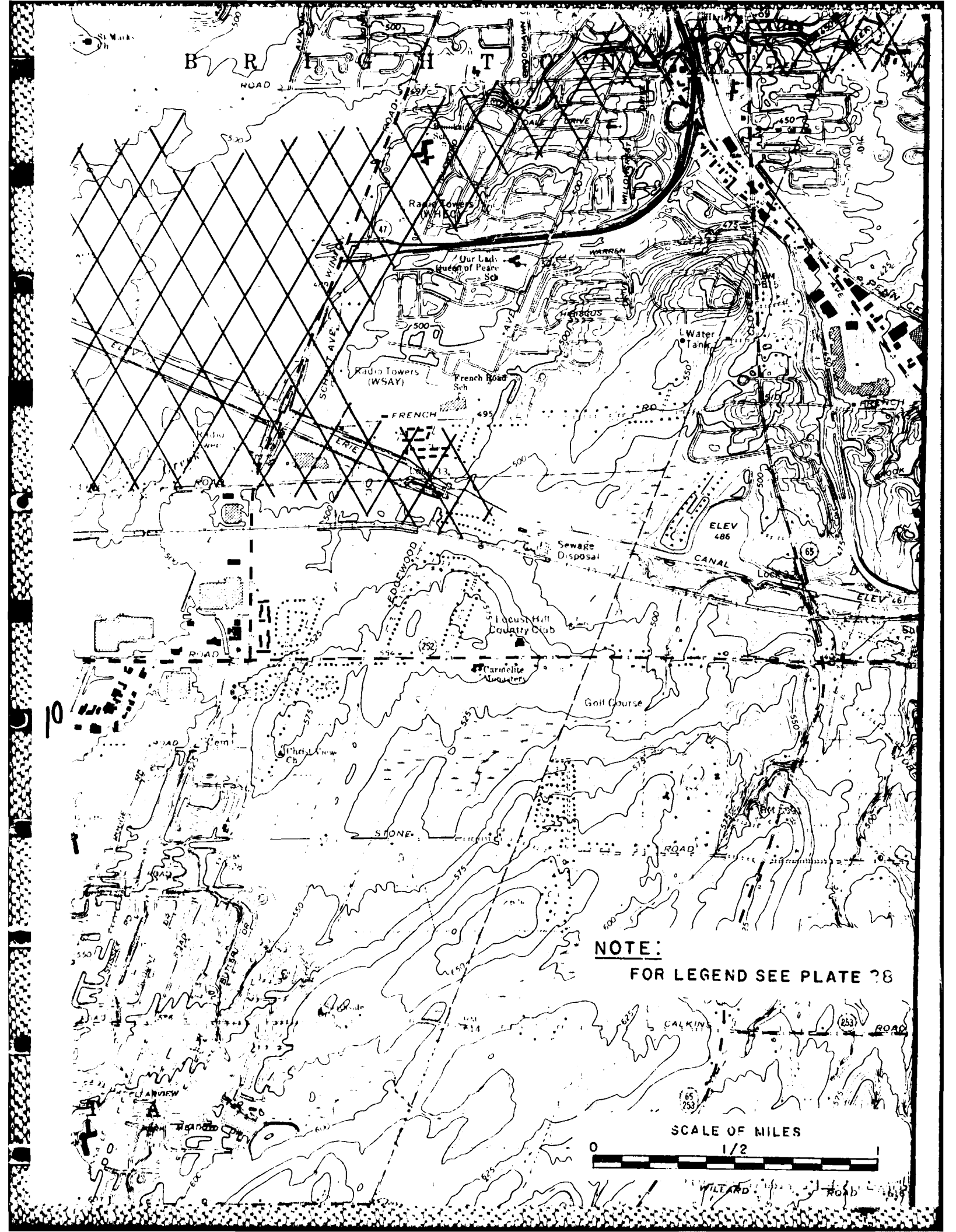

Cobbs Hill Reservoir
Radio Towers (WHEC)
Twelve Corners
Corners Jr High Sch
Temple Beth Kodesh
Corners High Sch
Twelve Corners Ch
BRIGHTON
ROAD
Brighton High Sch
Radio Towers (WHAM)
Our Lady Queen of Peace Sch
Water Tank
Radio Towers (WSAY)
French Road Sch
FRENCH
ERIE
CANAL
ELEV 486
Edgewood Cemetery
Mt Hope Cemetery
Golf Course
Lake Ontario
PENFIELD RD
WESTLAND AVE
EASTLAND AVE
COBB TER
BRAE AVE
BONNIE AVE
BROOKLAWN DR
WILLOWS ST
MEADOW DR
WARREN
HELENDUS
SCHOOL AVE
WINTON RD
CLOVER ST
PENN CENTRAL
ELMWOOD
ELEV 461

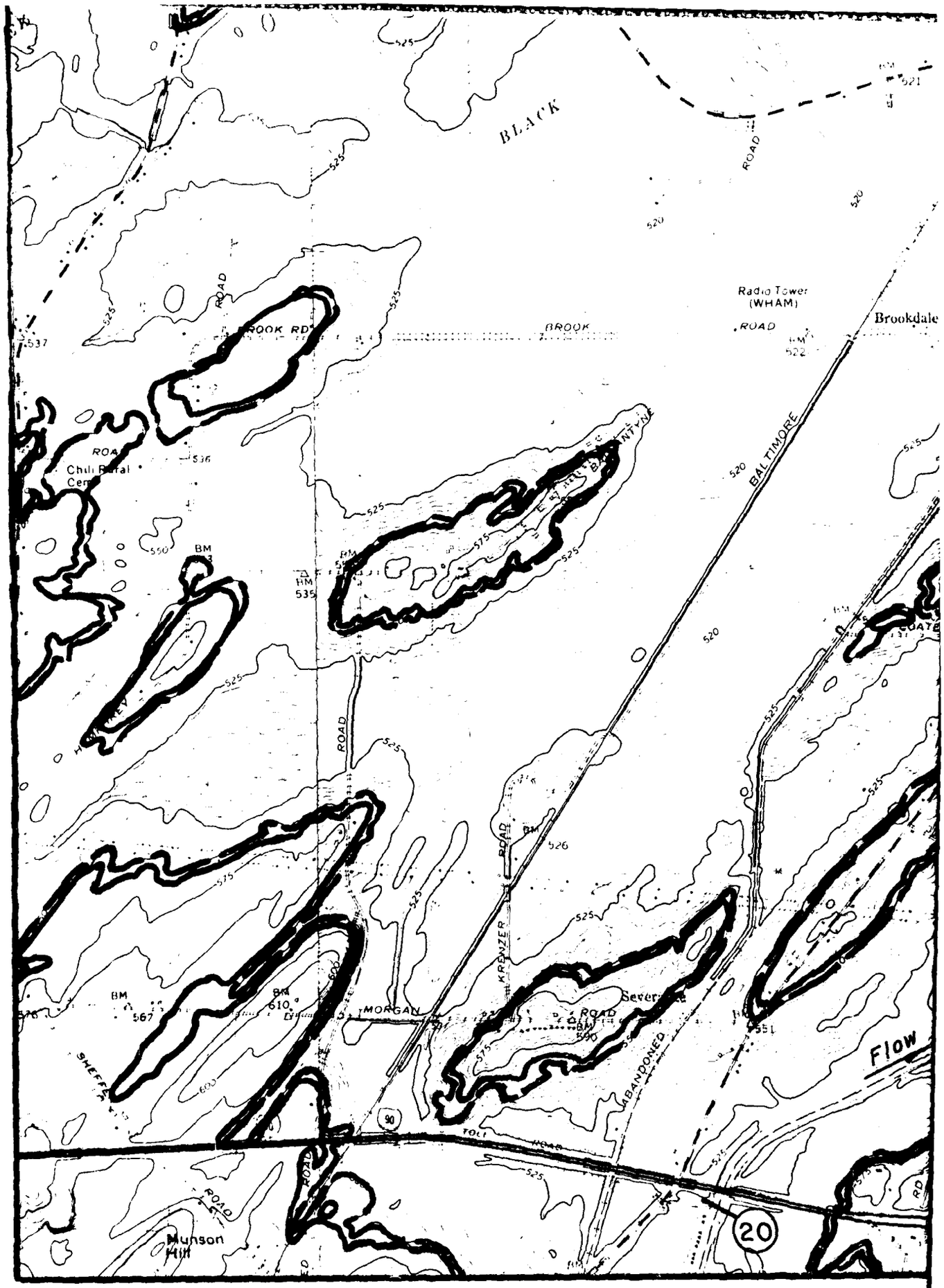

TELEPHONE
JENSEN DR
RIDGE
Brashear Sch
St Pats Sch
LAR&OO DR
St Patrick Cem
GATEWAY
BM 580
Chili
PAUL
Paul R
ARCHER
PENN CENTRAL
C H I
Beaver
BLACK
ROAD
BROOK
Brookdale
BALTIMORE

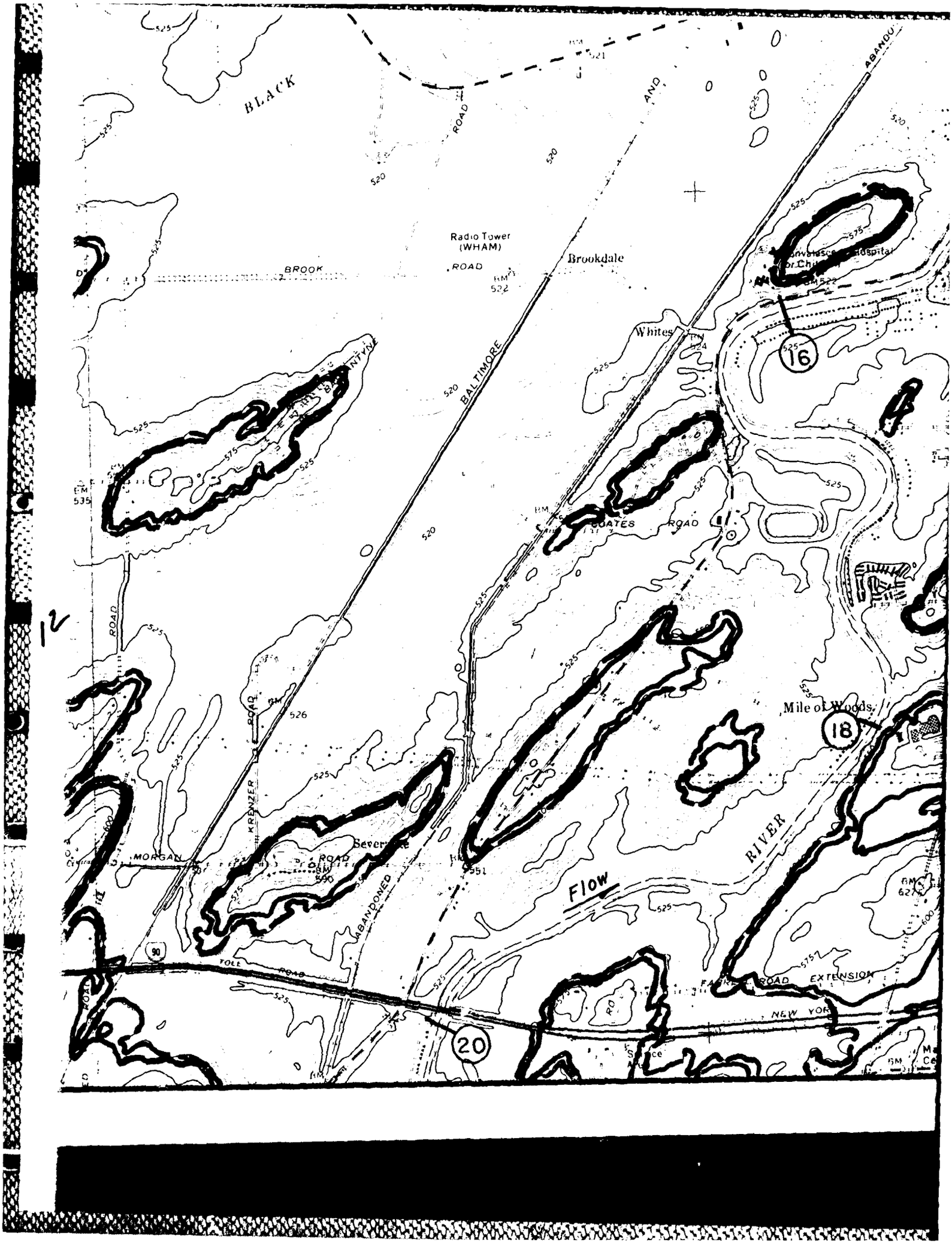

Maplewood
PENN CENTRAL
CHILI
CREEK
BLACK
ROAD
Radio Tower
(WHAM)
Brookdale
ABANDONED
BALTIMORE
16
252
490
555
552
544
520
525

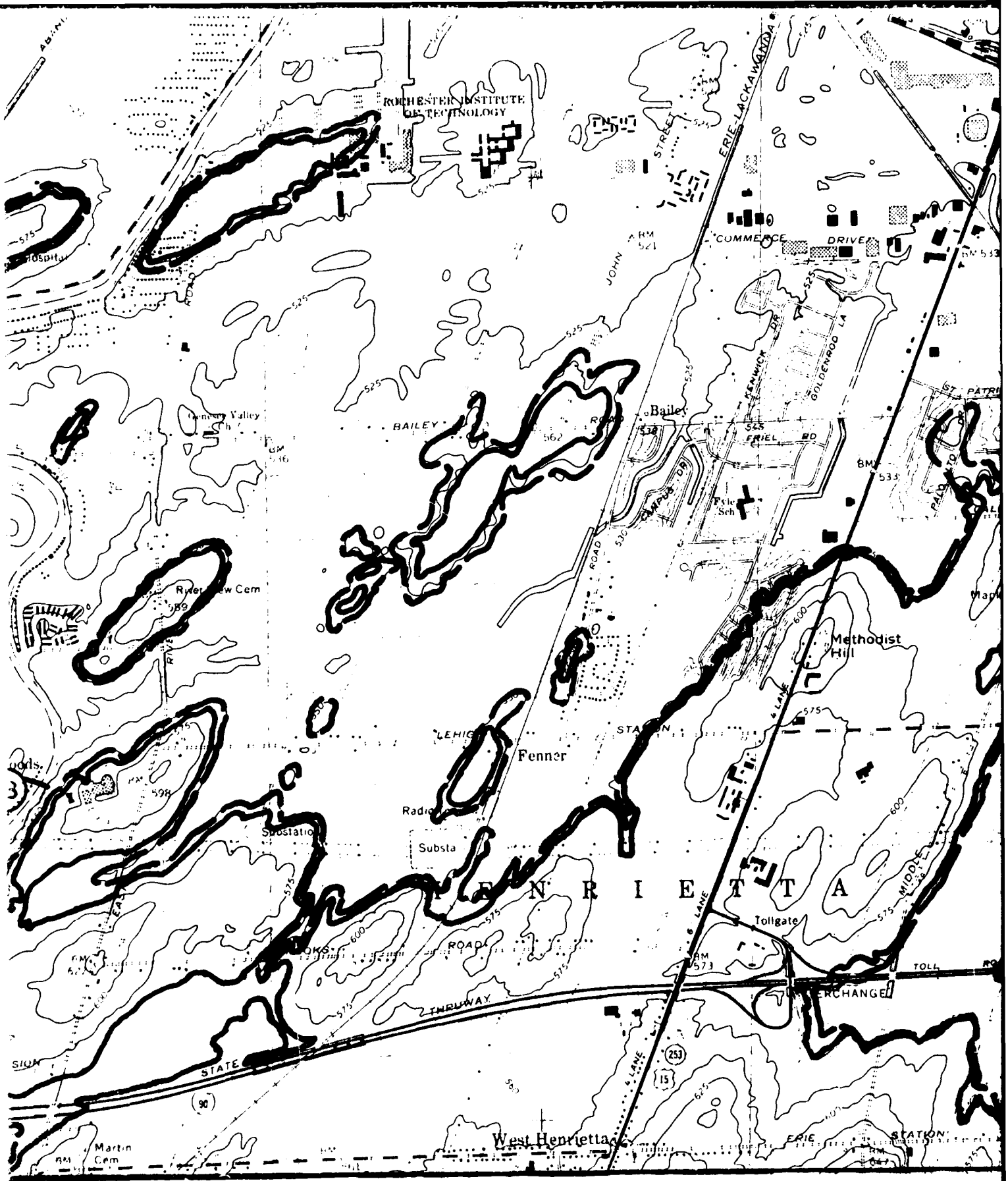

RIVER MILE = 14.3
DISTANCE FROM DAM = 52.6 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME(HRS) 18.0 | 17.5
PEAK ELEV(FT) 547.8 | 552.2
Maplewood
Sewage Disposal
Genesee Junction
Ballantyne Bridge
Ballantyne Sch
ROCHESTER CORP BDY
PENN CENTRAL
GENESEE
Golf Course
Trailer Park
Drive-In Theater
ABANDONED
ROCHESTER INSTITUTE OF TECHNOLOGY
ERIE LACKAWANNA
Flow
14
16
12
383
252
4 LANE


ROCHESTER
Brighton
ROCHESTER
Flow
Athletic Field
East Guard Lock
Westfall
Sewage Disposal
County Home and Infirmary
Water Tank
St Agnes High Sch
Crittenden
BRIGHTON
Crittenden Sch
Mortimer
Drive-in Theater
Ridgeland
PENN CENTRAL
JEFFERSON
Guardian Angels Sch
Veterans Memorial Park
Maplewood Cem
Methodist Hill
Monroe Community College
Radio Tow (WARC)
9

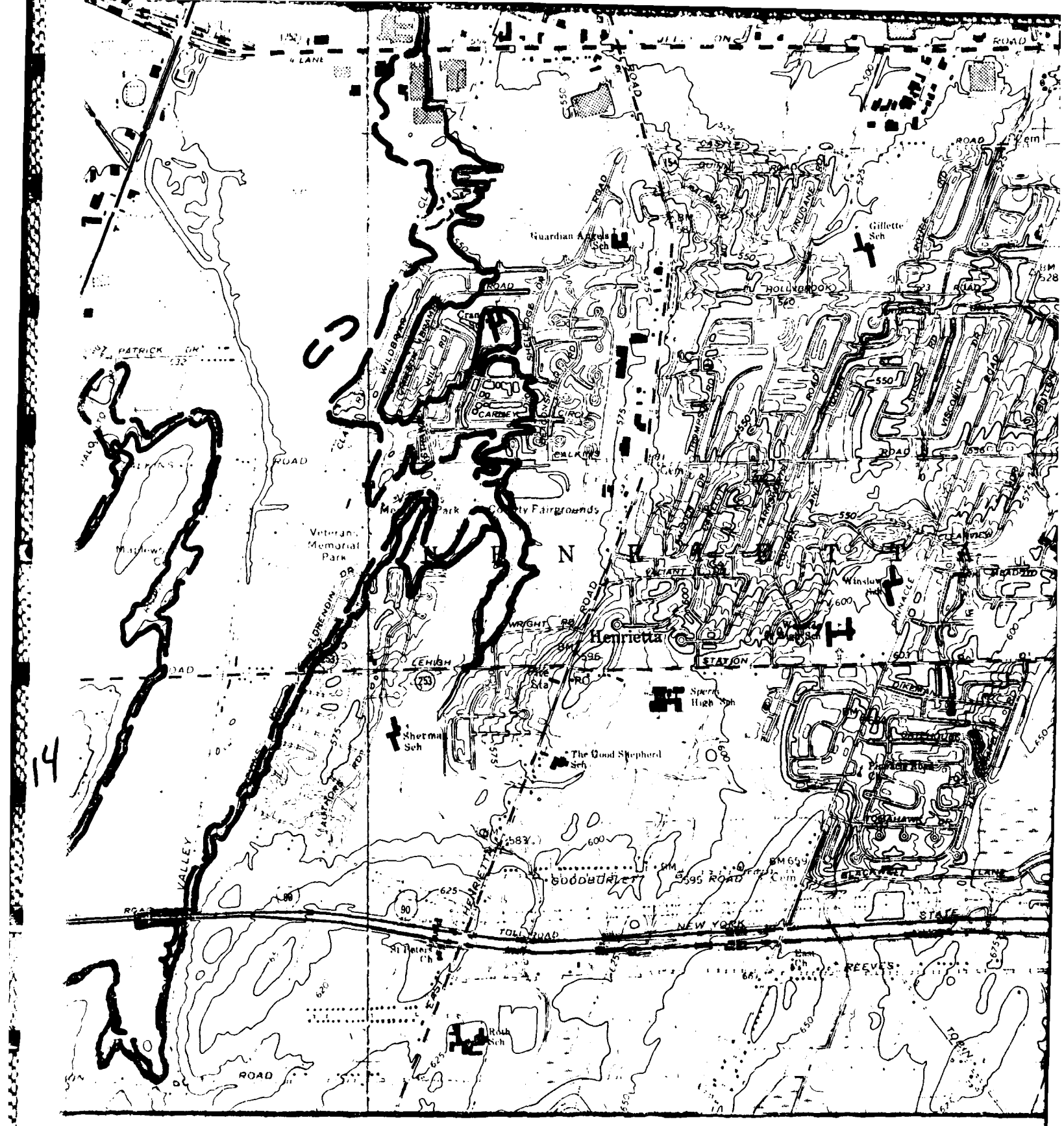

B R I G H T O N
Radio Towers (WHEC)
Our Lady Queen of Peace Sch
Radio Towers (WSAY)
French Road Sch
Water Tank
Sewage Disposal
ELEV 486
ELEV 461
Locust Hill Country Club
Carmelite Monastery
Golf Course
Christ the King Ch
CANAL
FRENCH
ROAD
STONE
CALKINS
WILLARD
SCALE OF MILES
0
1/2
1
NOTE:
FOR LEGEND SEE PLATE 28

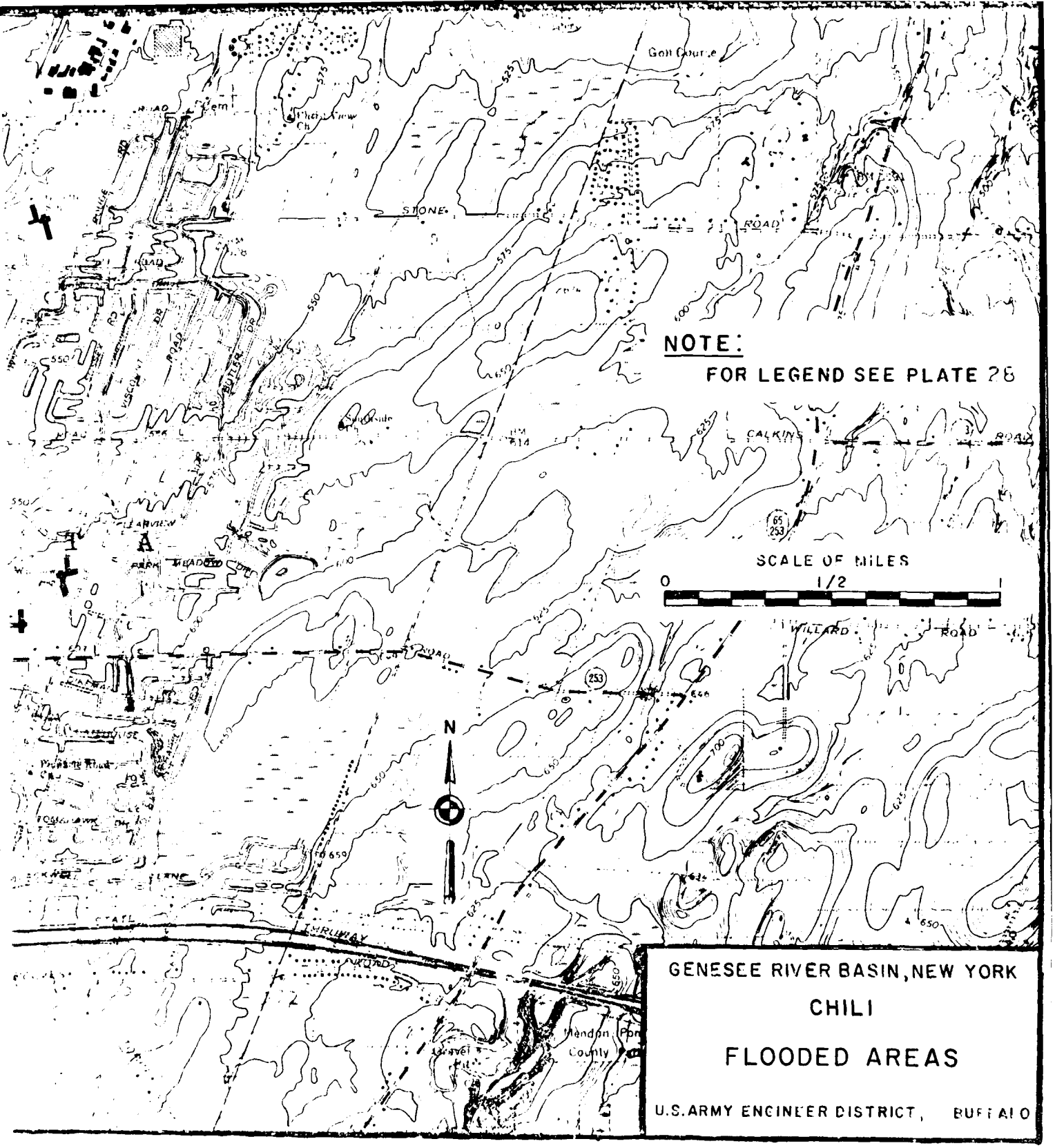

BLACK
ROAD
Radio Tower
(WHAM)
Brookdale
BROOK RD
BROOK
ROAD
BALTIMORE
ROAD
BM
HM
535
BM
526
KRENZER
ROAD
MORGAN
ROAD
BM
567
BM
510
BM
590
HM
551
ABANDONED
Flow
SHEFFER
ROAD
Munson
Hill
90
TOLL
20
525
520
575
600


BLACK
BROOK
ROAD
Radio Tower
(WHAM)
Brookdale
BALTIMORE
ABANDONED
Whites
16
BM 522
BM 524
BM 535
BM 526
BM 551
BM 590
BM 627
SOATES
ROAD
Mile of Woods
18
KRENZER
MORGAN
Flow
RIVER
ABANDONED
90
TOLL
ROAD
EXTENSION
NEW YORK
20
525
520
575
600


ROCHESTER INSTITUTE OF TECHNOLOGY
ERIE-LACKAWANNA
COMMERCE DRIVE
JOHN ARM
BAILEY ROAD
Bailey
FRIEL RD
CAMPUS DR
Methodist Hill
Fenner
Substation
Substa
HENRIETTA
Tollgate
TOLL
ROAD
2 THRUWAY
STATE
West Henrietta
STATION
6 LANE
MIDDLE
Martin Cem

13


Guardian Angels Sch
Gillette Sch
HOLLYBROOK
PATRICK DR
Veterans Memorial Park
Fairgrounds
Henrietta
WRIGHT RD
LEHIGH STATION
Sherman Sch
The Good Shepherd Sch
Spencerport High Sch
GOODDALE
NEW YORK STATE
TOLL ROAD
REEVES
VALLEY
ROAD
14



GENESEE RIVER BASIN, NEW YORK

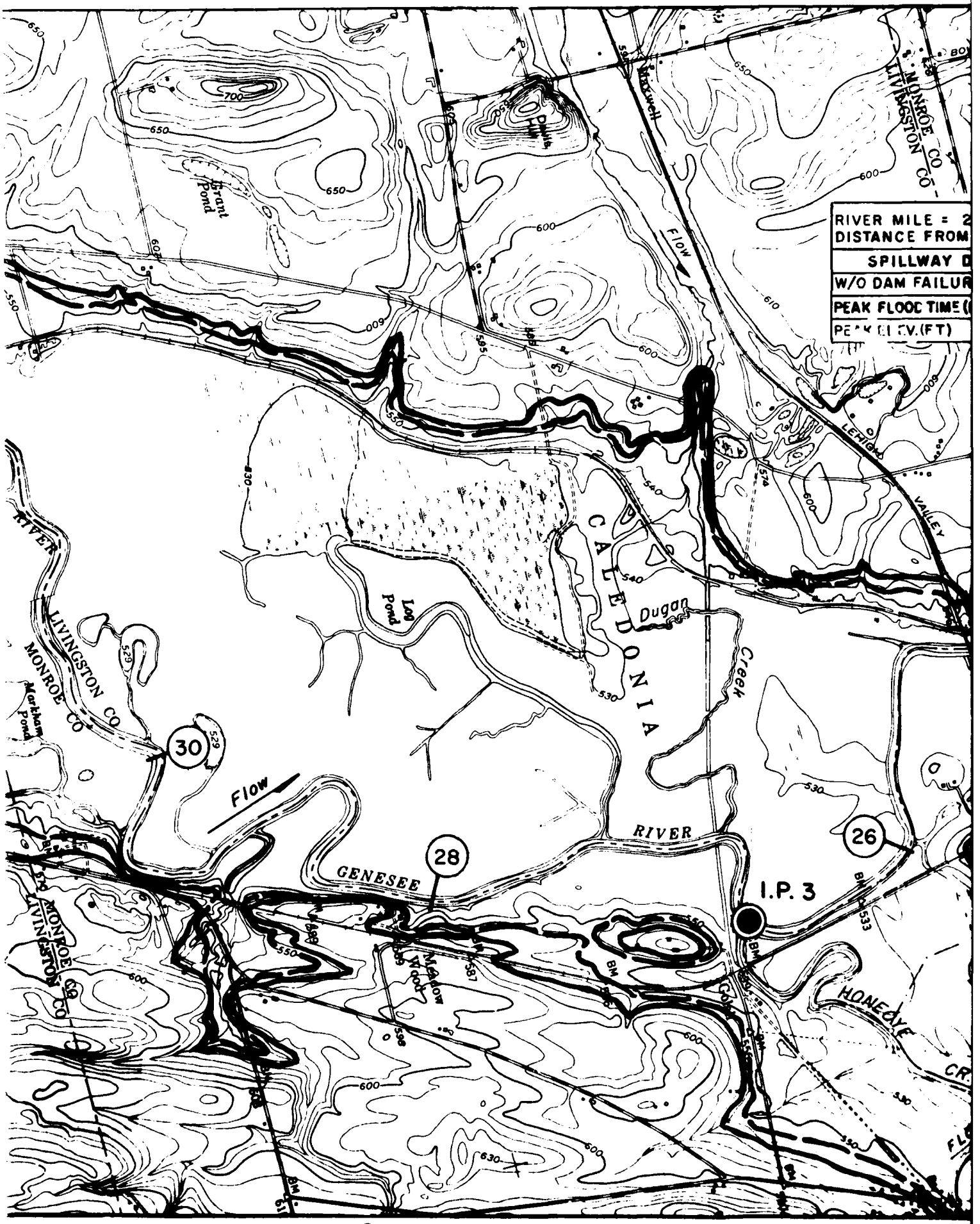
CHILI

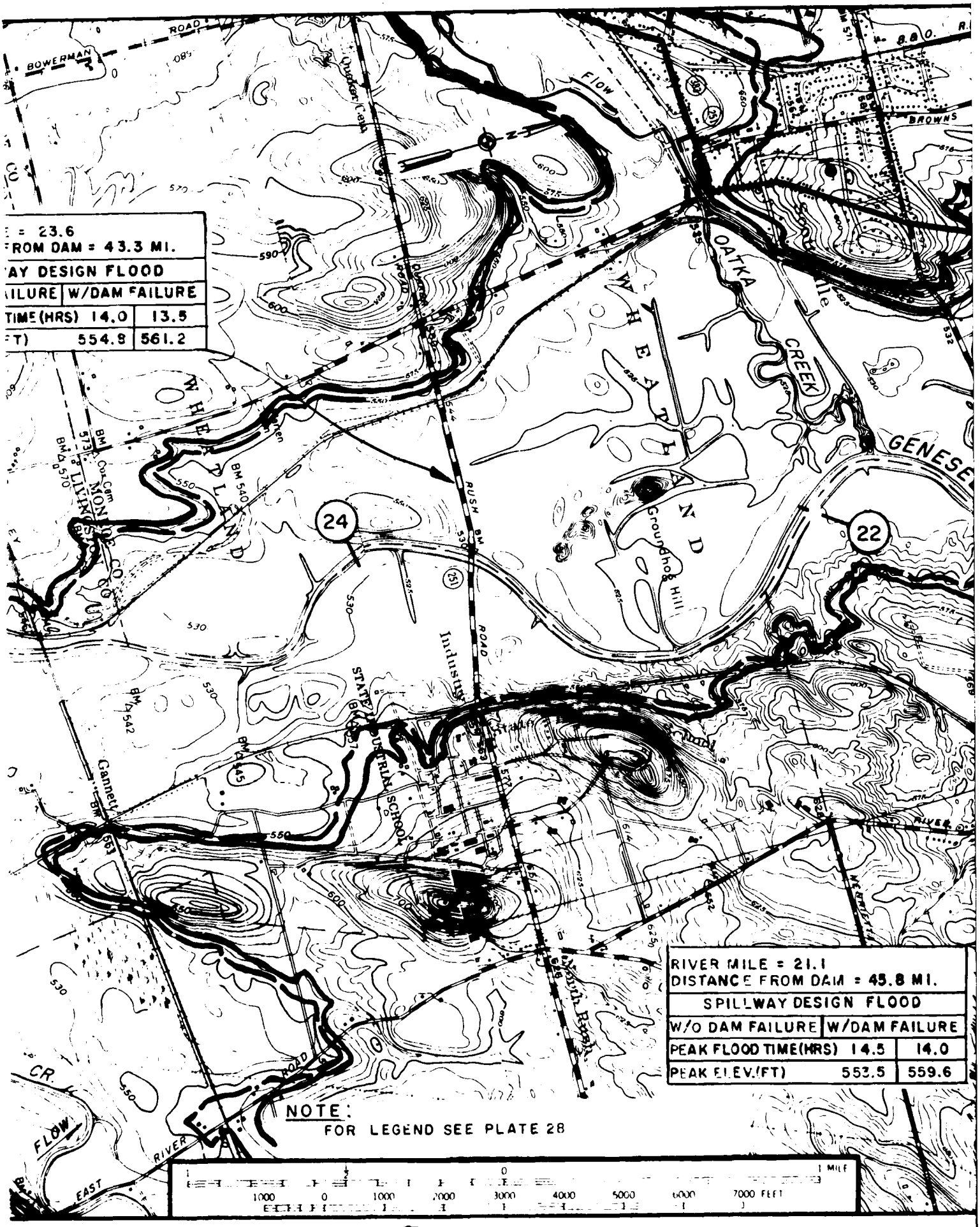
FLOODED AREAS

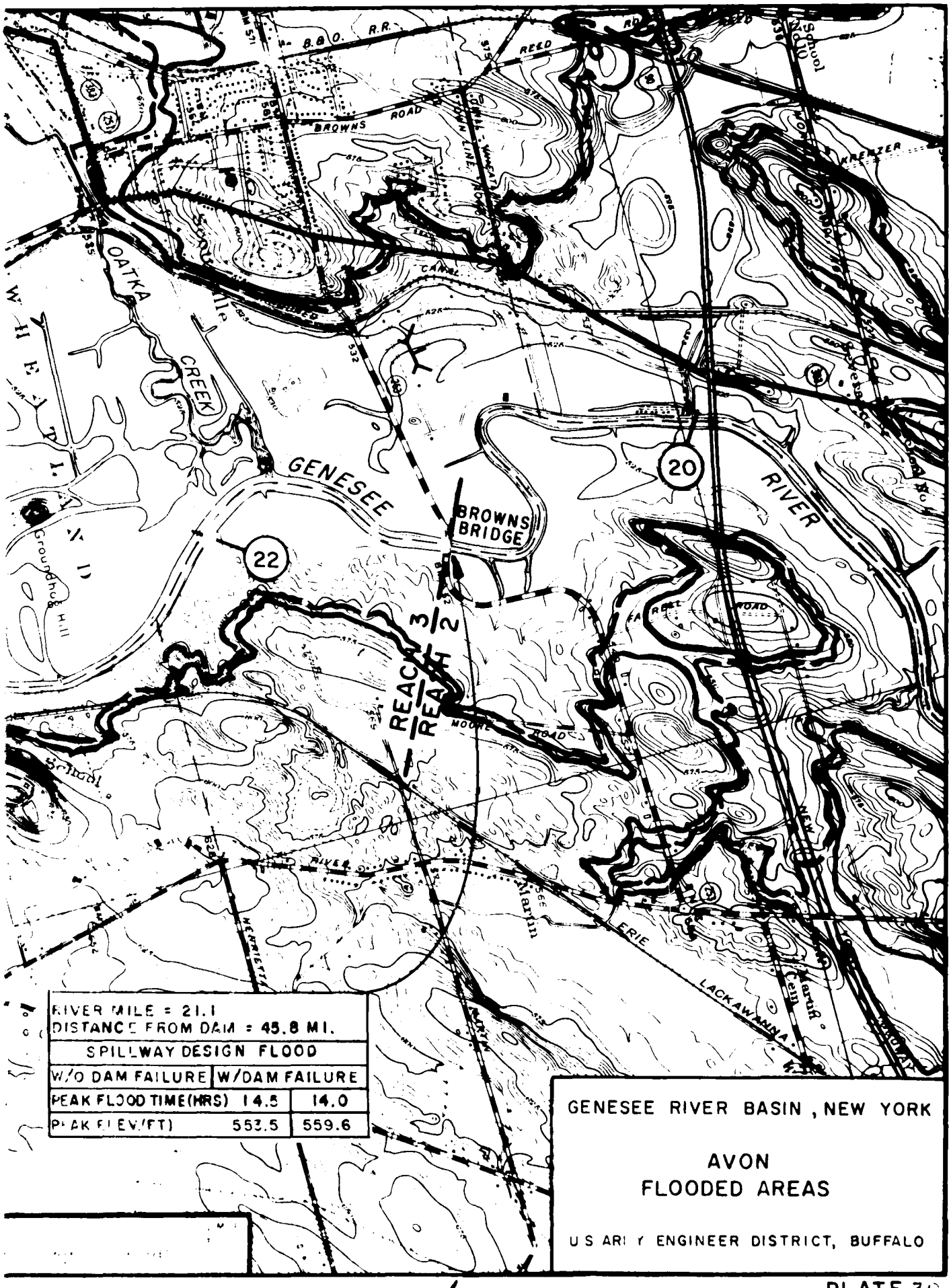
U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 15


REACH 4
REACH 3
ERIE LACKAWANNA
PENN CENTRAL
GENESEE
RUSH
RIVER
LIVINGSTON
MONROE CO
Horseshoe Pond
Markham Pond
LACKAWANNA
ERIE
AVON
Flintstein
Cam
BM556
BM552
34
32
36
RIVER MILE = 35.2
DISTANCE FROM DAM = 31.7 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE
W/DAM FAILURE
PEAK FLOOD TIME (HRS) 12.0 11.0
PEAK ELEV.(FT) 558.5 565.8


RIVER MILE = 2
DISTANCE FROM
SPILLWAY D
W/O DAM FAILUR
PEAK FLOOD TIME (
PEAK ELEV.(FT)
Grant Pond
Maxwell
MONROE CO
LIVINGSTON CO
FLOW
LEHIGH VALLEY
CALEDONIA
Log Pond
Dugan Creek
RIVER
LIVINGSTON
MONROE CO
Markham Pond
30
28
26
FLOW
GENESEE
I.P. 3
Meadow
HONEOYE
BM
650
600
550
530
540
630


= 23.6
FROM DAM = 43.3 MI.
AY DESIGN FLOOD
ILURE | W/DAM FAILURE
TIME(HRS) 14.0 | 13.5
T) 554.8 | 561.2
WHEATLAND
OATKA CREEK
GENESEE
RUSH
Industry ROAD
STATE
Groundhog Hill
MONROE CO
Gannett
RIVER
FLOW
EAST
RIVER MILE = 21.1
DISTANCE FROM DAM = 45.8 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME(HRS) 14.5 | 14.0
PEAK ELEV.(FT) 553.5 | 559.6
NOTE:
FOR LEGEND SEE PLATE 28
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET



RIVER MILE = 21.1 DISTANCE FROM DAM = 45.8 MI.		
SPILLWAY DESIGN FLOOD		
W/O DAM FAILURE	W/DAM FAILURE	
PEAK FLOOD TIME(HRS)	14.5	14.0
PEAK ELEV.(FT)	553.5	559.6

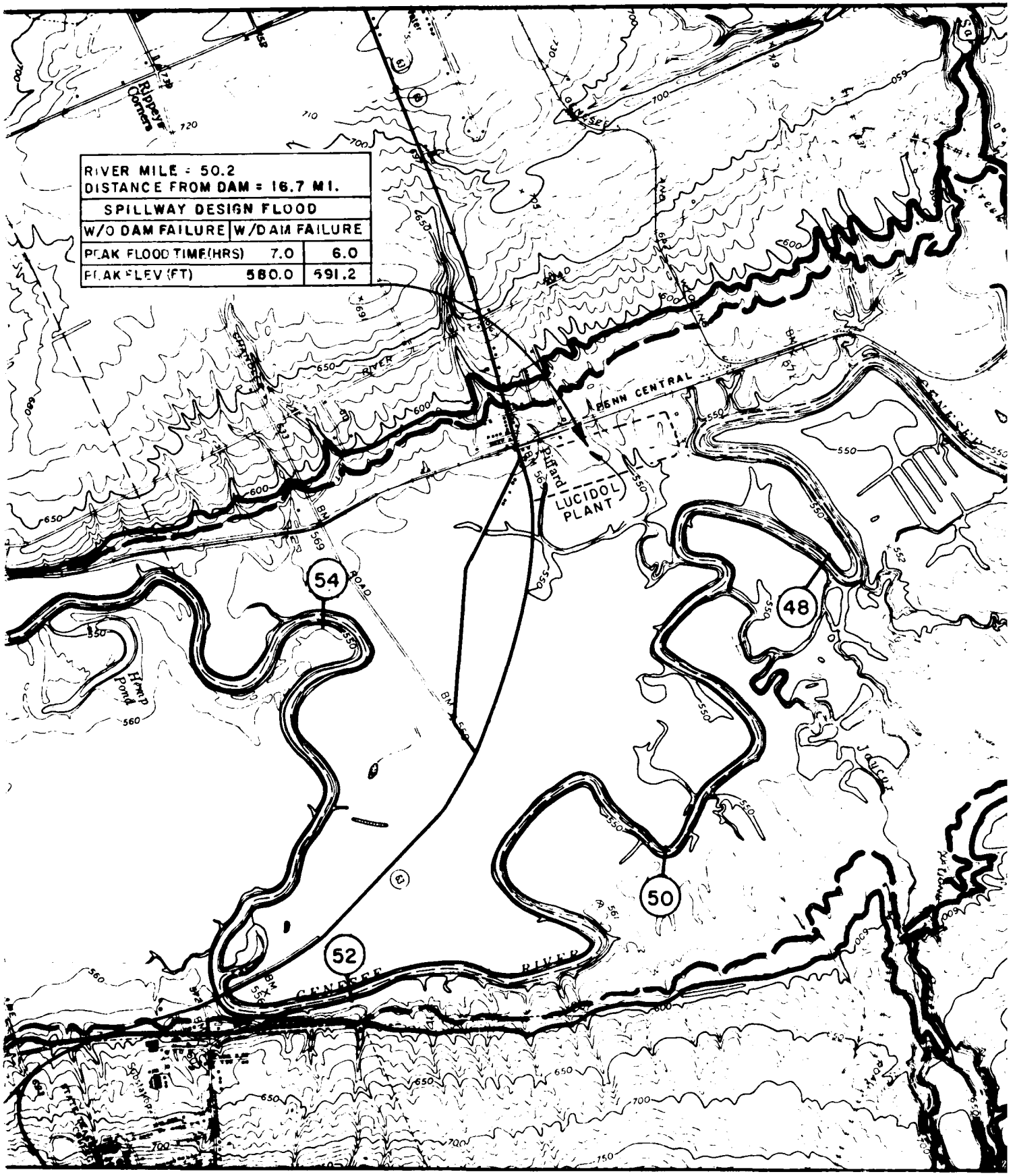
GENESEE RIVER BASIN, NEW YORK

AVON
FLOODED AREAS

U S ARMY ENGINEER DISTRICT, BUFFALO

PLATE 30

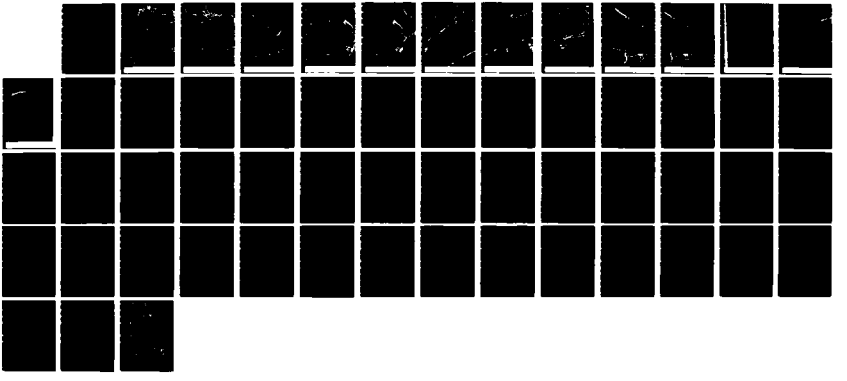

RIVER MILE = 50.2
DISTANCE FROM DAM = 16.7 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE
W/DAM FAILURE
PEAK FLOOD TIME (HRS) 7.0 6.0
PEAK ELEV (FT) 580.0 591.2
Ripley's Corners
PENN CENTRAL
Pittard
LUCIDOL PLANT
54
48
50
52
Hemp Pond
CENTRE RIVER
BM 569
BM 557

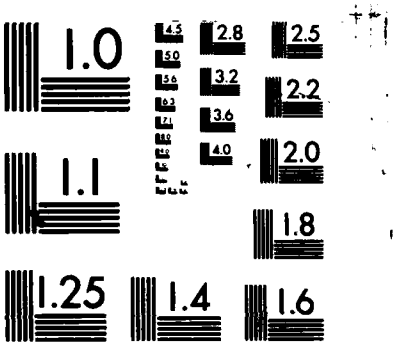

RIVER MILE = 50.2
DISTANCE FROM DAM = 16.7 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE
W/DAM FAILURE
PEAK FLOOD TIME(HRS) 7.0 6.0
PEAK ELEV (FT) 580.0 591.2
Rippey Corners
PENN CENTRAL
Pilfard
LUCIDOL PLANT
54
48
50
52
Hmp Pond
CEDAR RIVER
ROAD
BM 569
BM 561
BM 554

2

AD-A165 550 FLOOD EMERGENCY PLAN MOUNT MORRIS DAM GENESEE RIVER WATERSHED NEW YORK(U) CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT OCT 85 2/2

UNCLASSIFIED F/G 13/2 NL



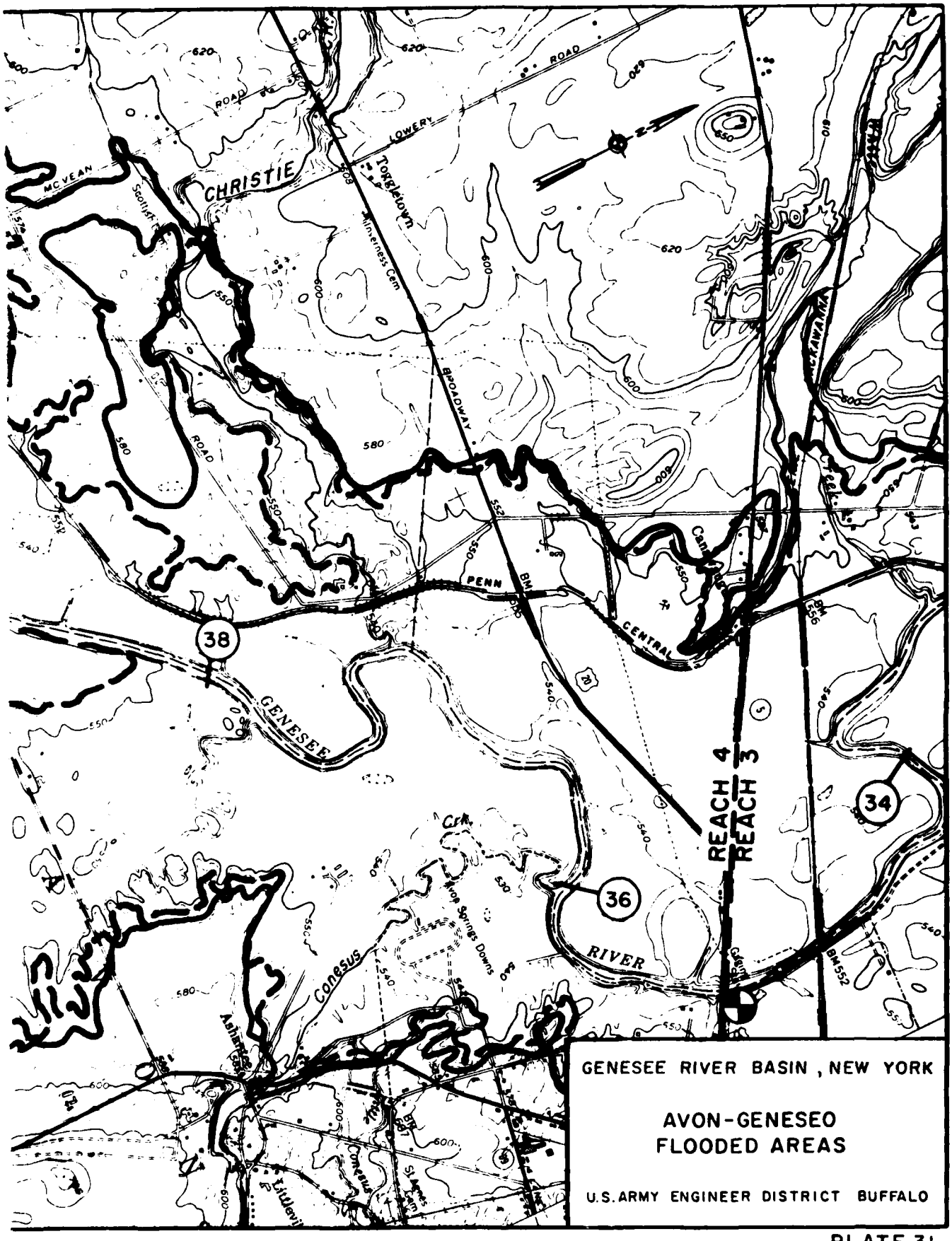


MICROCOPY RESOLUTION TEST CHART


44
42
46
8
Flow
OXBOW
LANE
ROAD
NATIONS
HOGMIRE
RIVER
TAVERN
NOTE:
FOR LEGEND SEE PLATE 28
0
1000
0
1000
2000
3000
4000
5000
6000

TE:
FOR LEGEND SEE PLATE 28

4

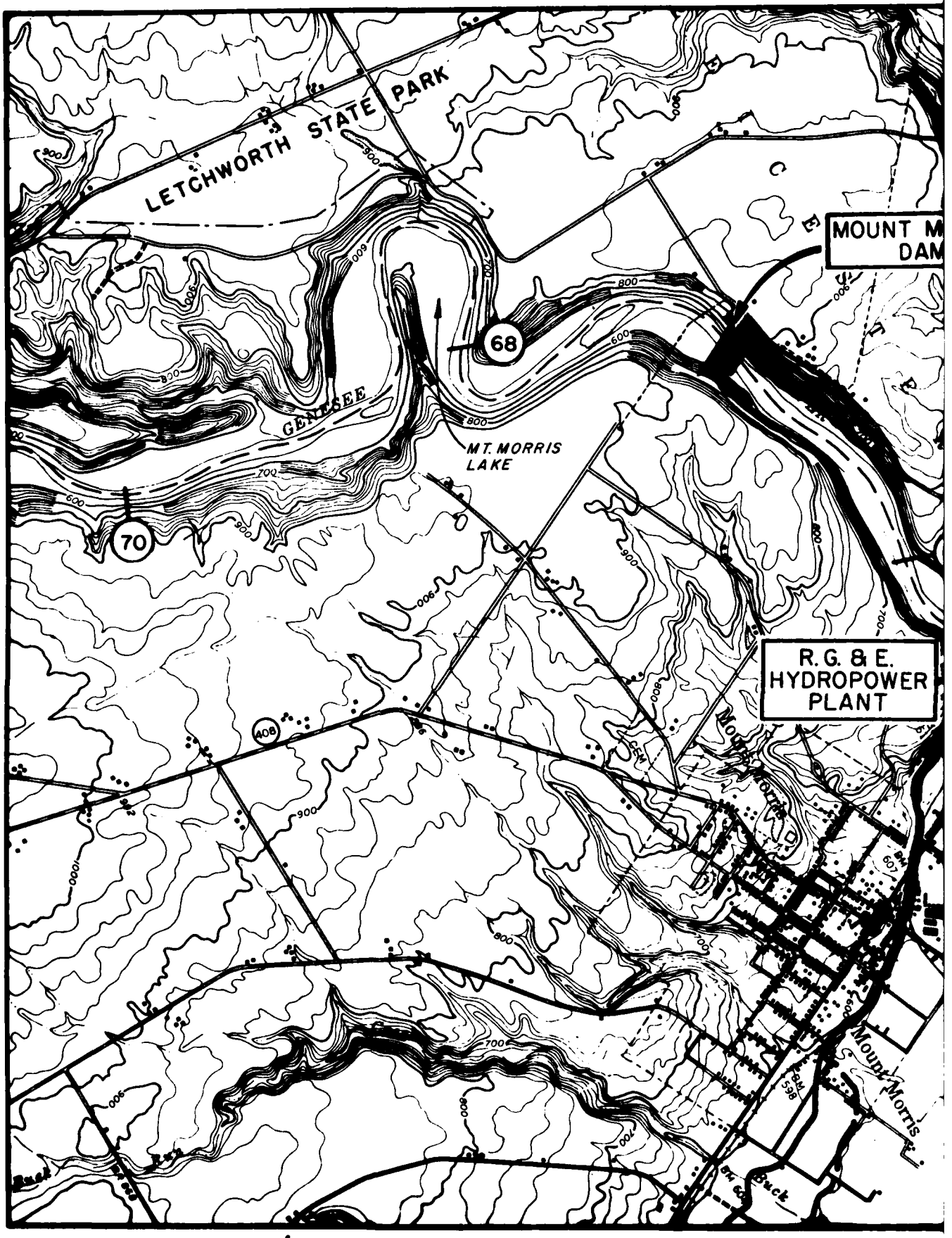


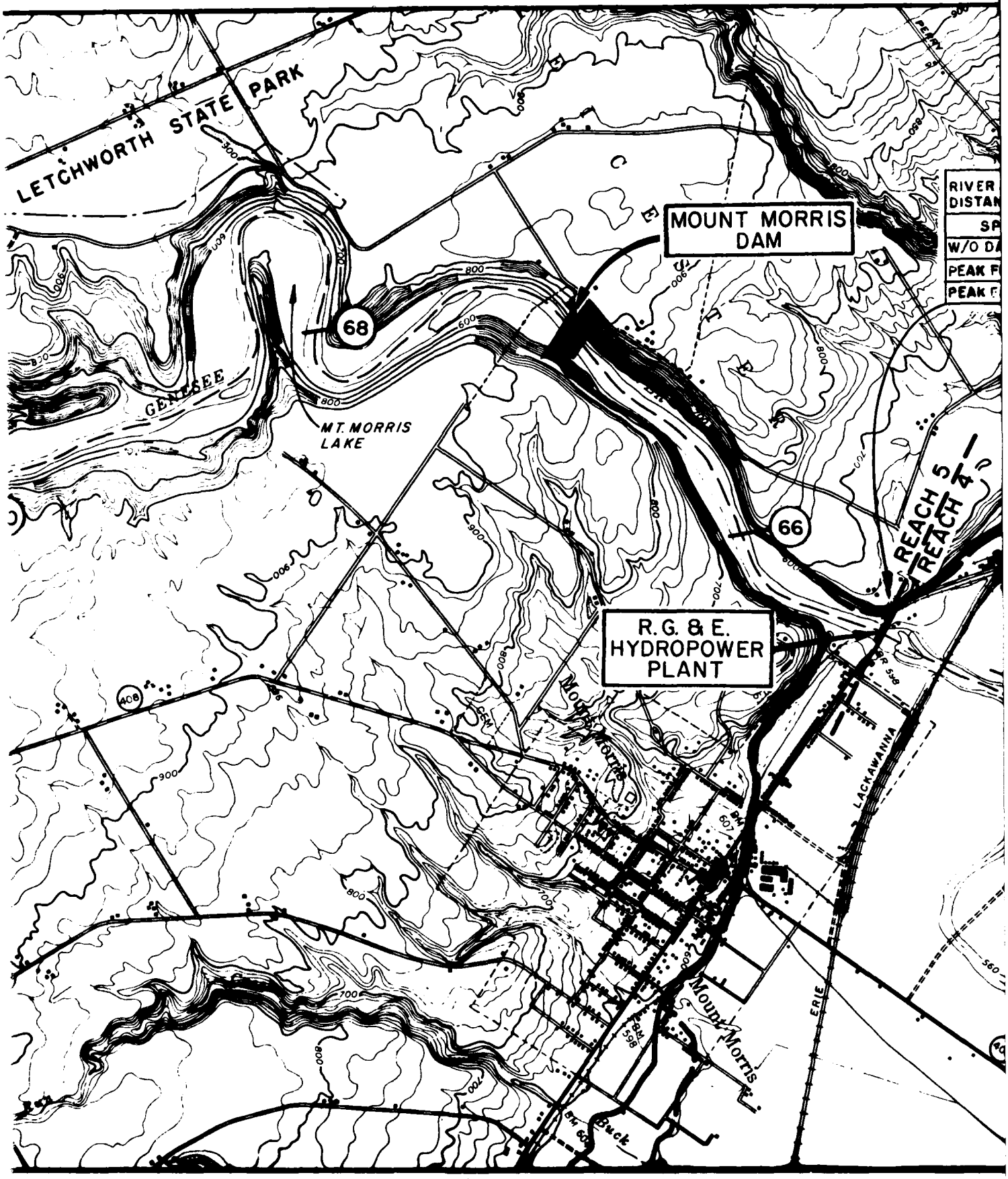
GENESEE RIVER BASIN, NEW YORK

AVON-GENESEO
FLOODED AREAS

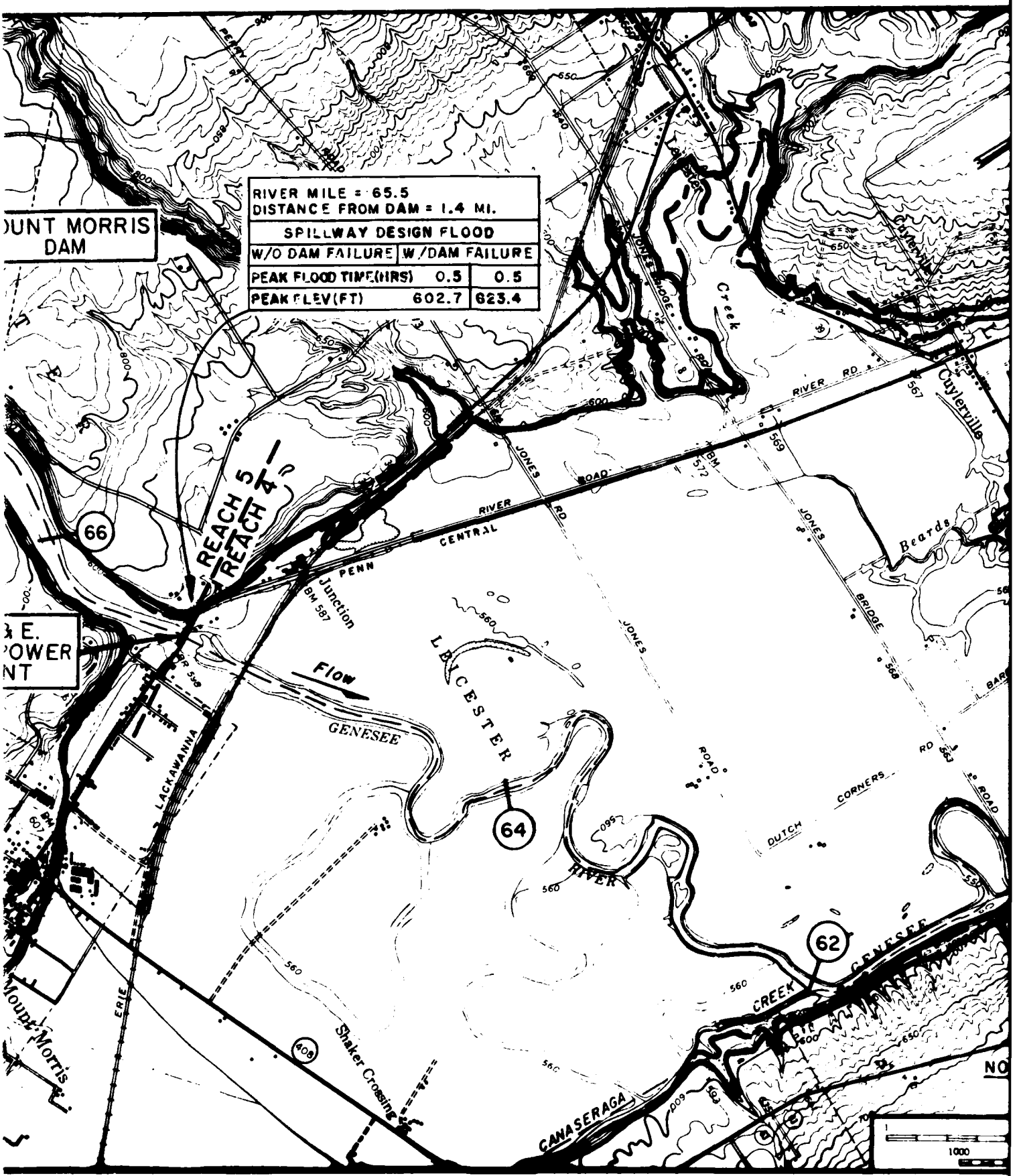
U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE 31

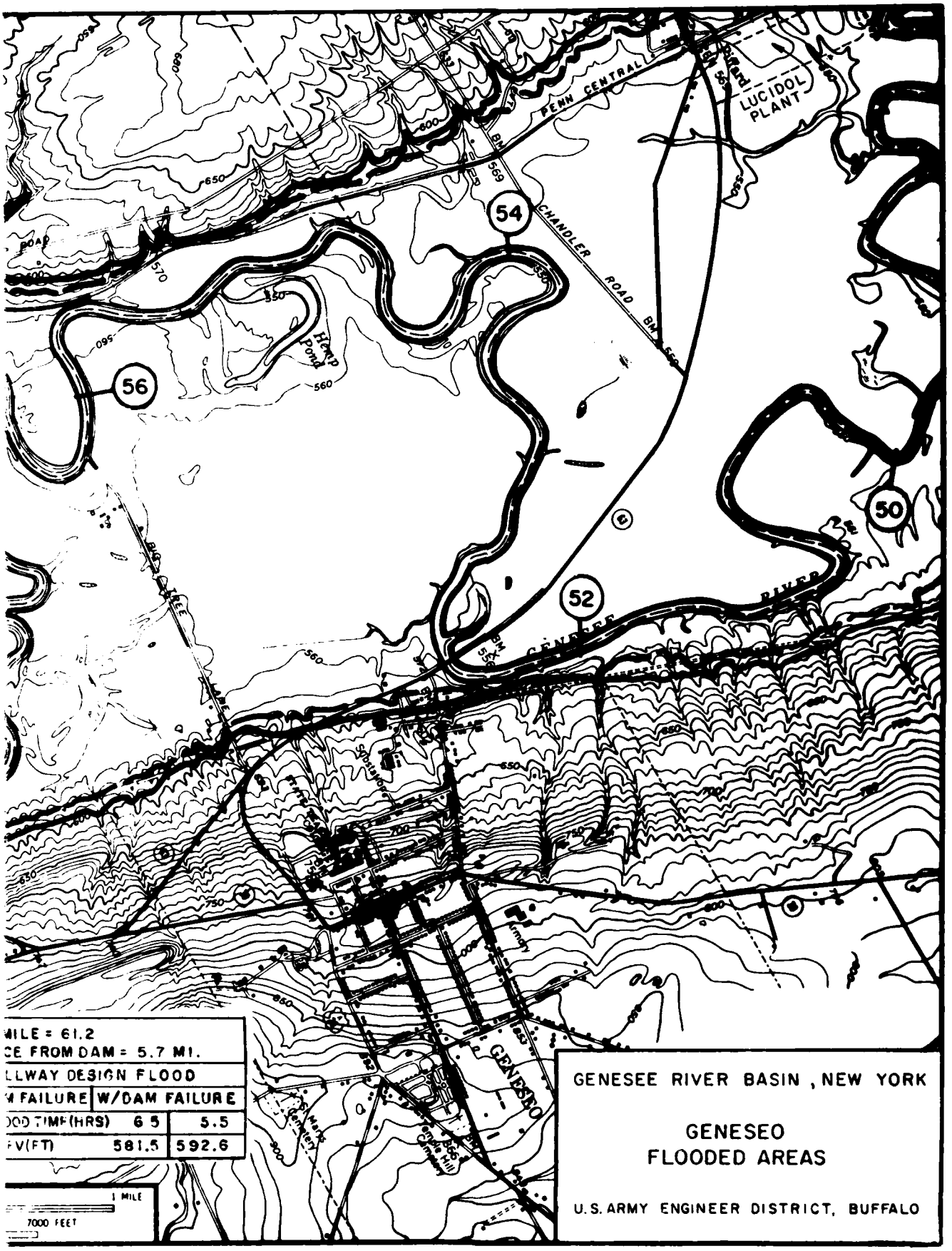

LETCHWORTH STATE PARK
MOUNT M
DAM
68
GENESEE
MT. MORRIS
LAKE
70
408
R.G. & E.
HYDROPOWER
PLANT
Mount Morris
Mount Morris
Buck
Buck


LETCHWORTH STATE PARK
MOUNT MORRIS DAM
MT. MORRIS LAKE
GENESEE
R.G. & E. HYDROPOWER PLANT
REACH 5
REACH 4
LACKAWANNA
ERIE
Mount Morris
Buck
68
66
408
RIVER DISTAN
SP
W/O DA
PEAK F
PEAK F

2


RIVER MILE = 65.5
DISTANCE FROM DAM = 1.4 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W./DAM FAILURE
PEAK FLOOD TIME(HRS) 0.5 | 0.5
PEAK ELEV(FT) 602.7 | 623.4
DAM
REACH 5
REACH 4
66
64
62
408
RIVER RD.
JONES ROAD
PENN CENTRAL
Junction
BM 587
BM 577
FLOW
GENESEE
LACKAWANNA
ERIE
LEICESTER
DUTCH CORNERS ROAD
RIVER
CREEK
Shaker Crossing
CANASERAGA
Cuylerville
Beards
JONES BRIDGE
1000


Cuylerville
Cuylerville
Clerk
Heard's
BOYD-PARMER STATE PARK
BRIDGE
BARRETT RD
CORNERS
ROAD
RIVER
GENESEE
Hemp Pond
56
58
60
62
RIVER MILE = 61.2
DISTANCE FROM DAM = 5.7 MI.
SPILLWAY DESIGN FLOOD
W/O DAM FAILURE | W/DAM FAILURE
PEAK FLOOD TIME (HRS) 6.5 | 5.5
PEAK ELEV (FT) 581.5 | 592.6
NOTE:
FOR LEGEND SEE PLATE 28
0
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET



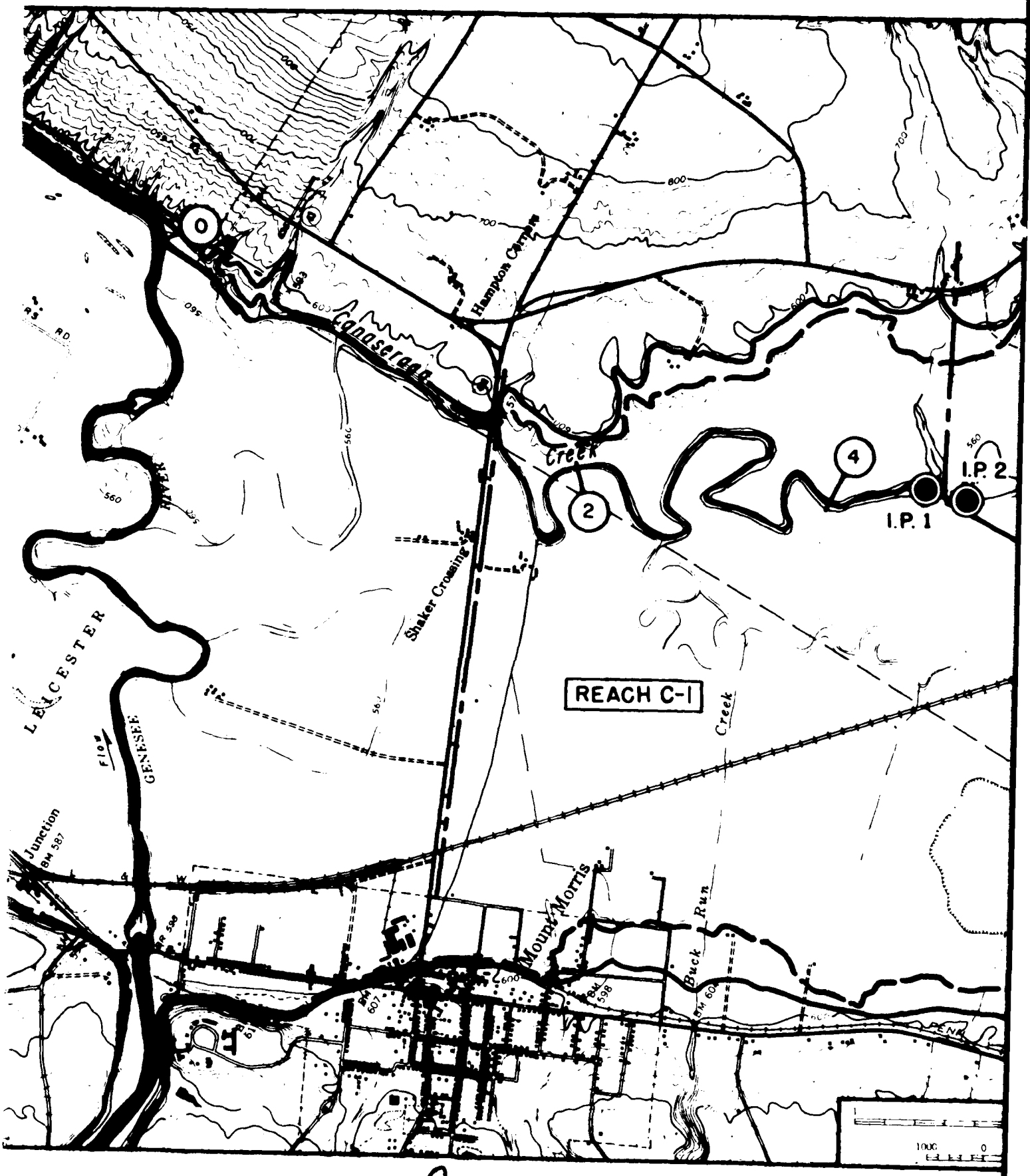
GENESEE RIVER BASIN, NEW YORK

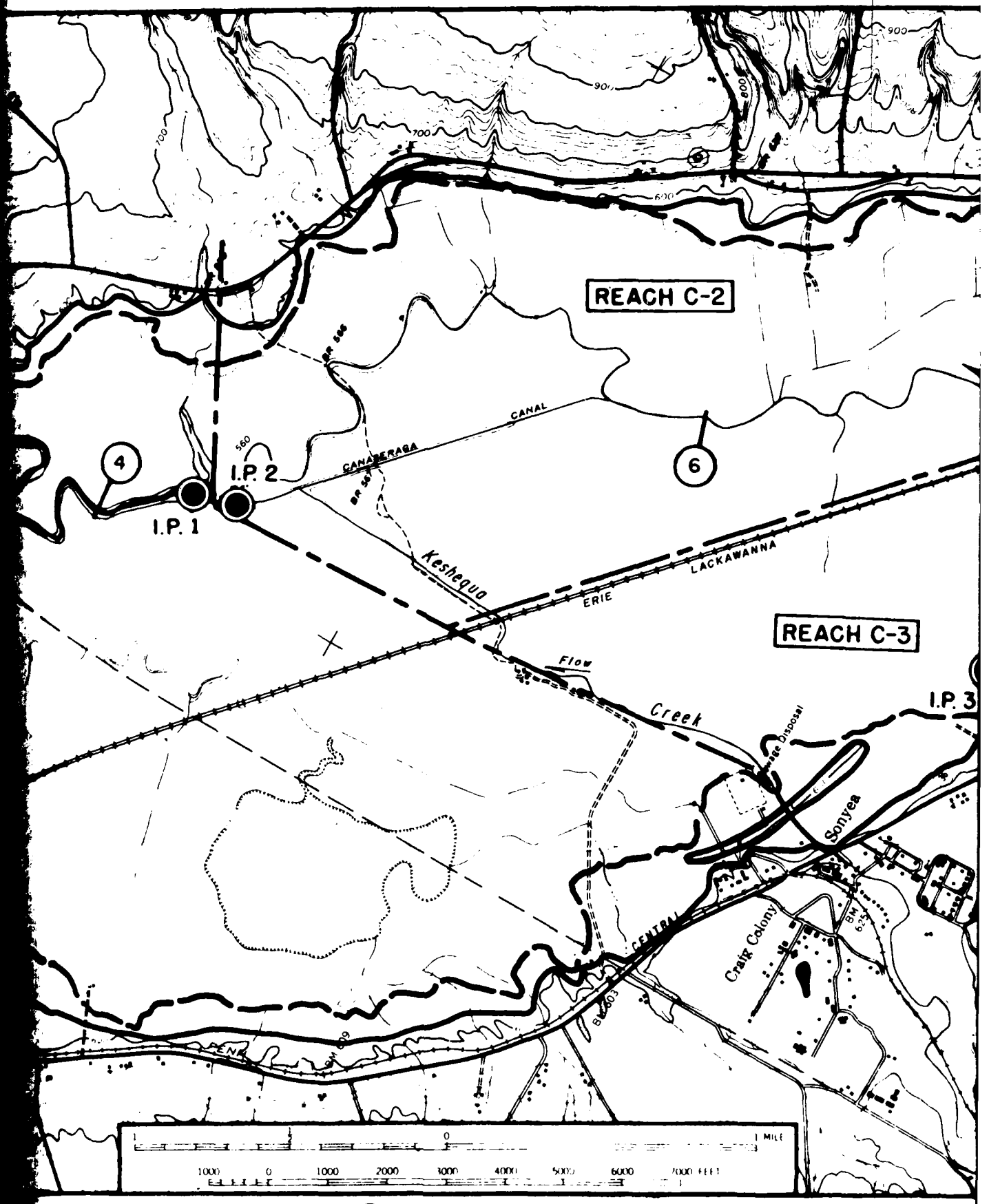
GENESEO
FLOODED AREAS

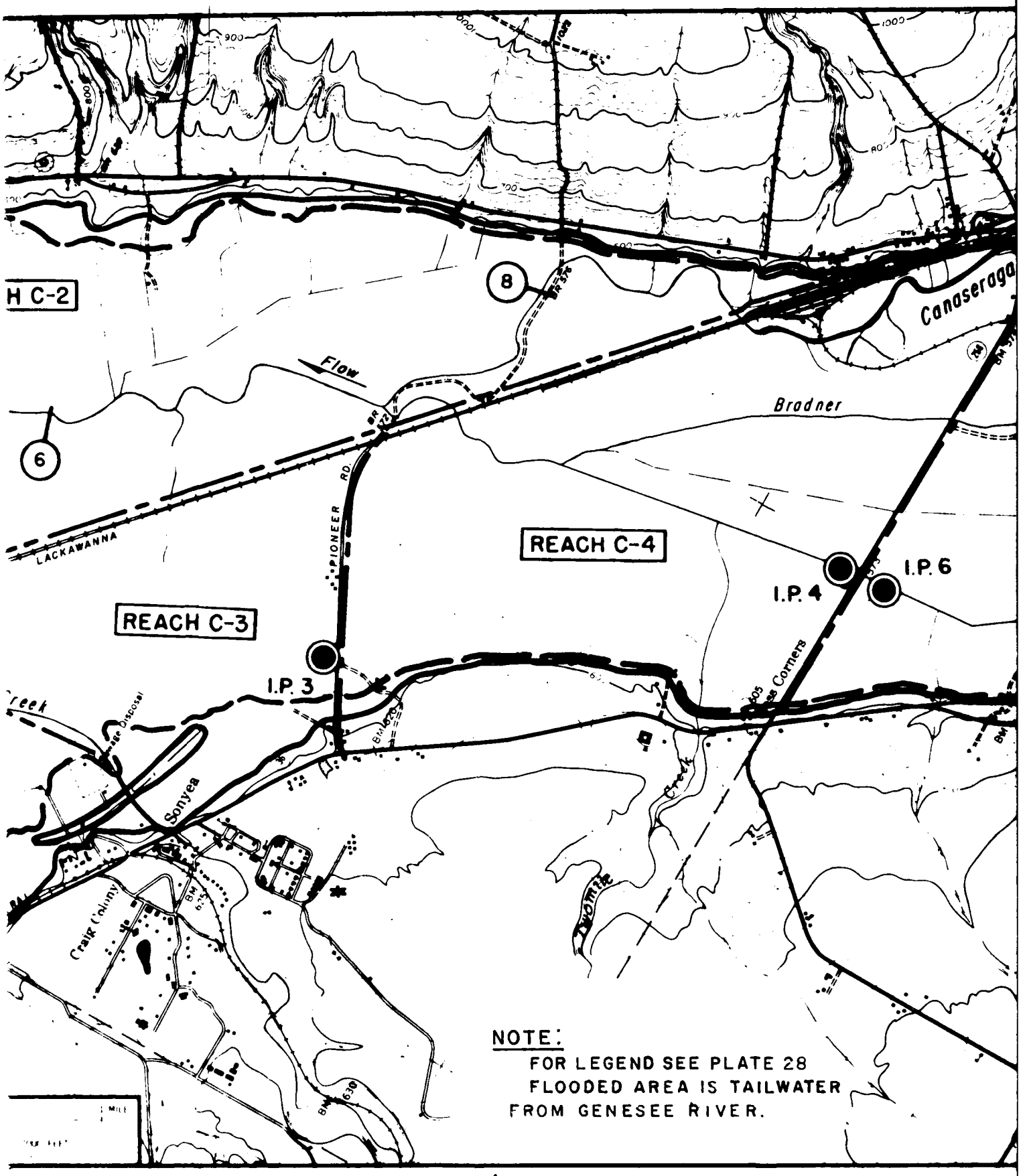
U.S. ARMY ENGINEER DISTRICT, BUFFALO

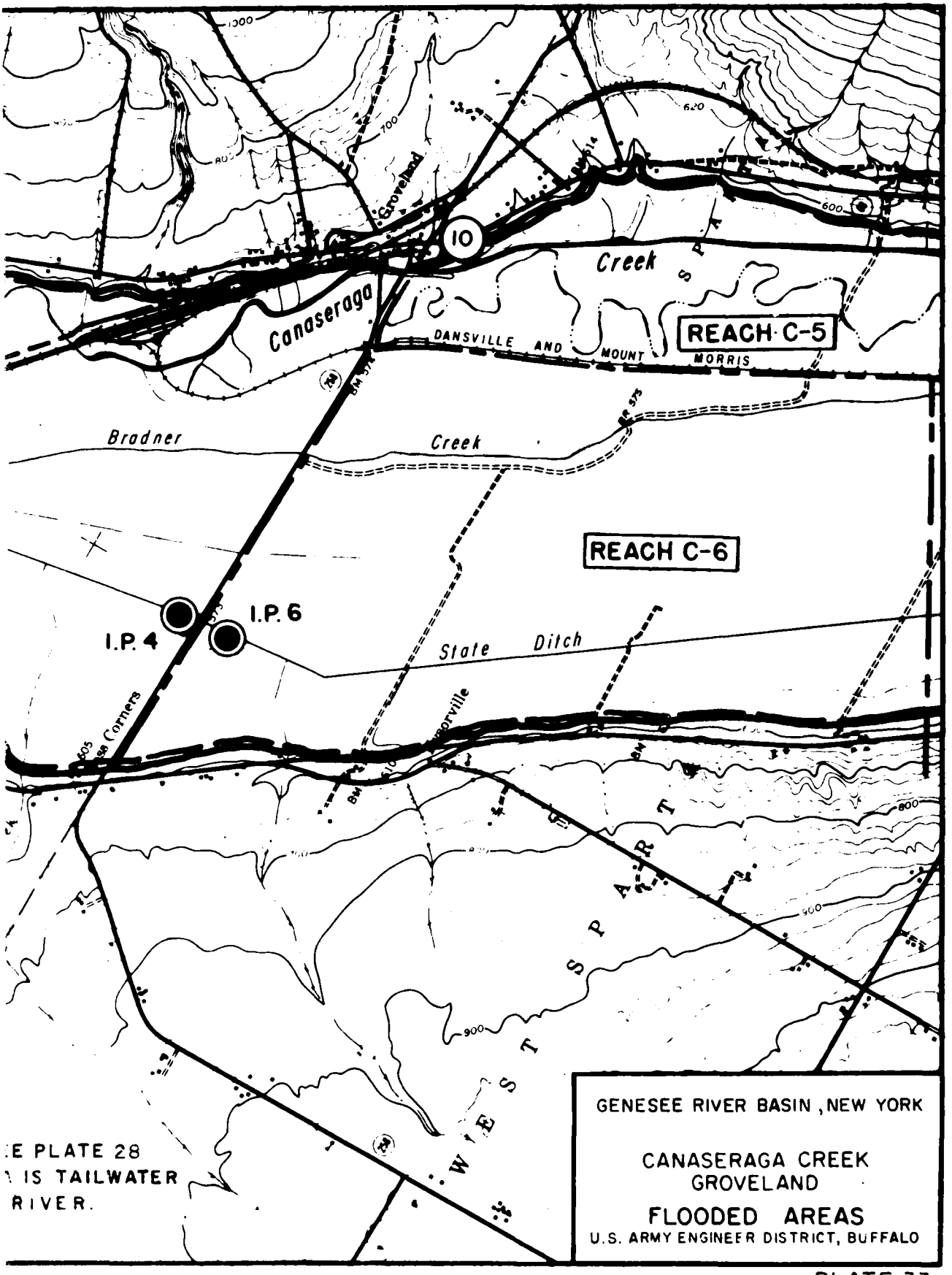
PLATE 32

JONES - BRIDGE RD.
DUTCH CORNERS RD.
JONES ROAD
LEICESTER
PENN CENTRAL
Junction
BM 587
GENESEE
Flow
Conaseraga
Creek
Hampton Corners
Shaker Crossing
REACH C-1
Mount Morris
Buck Run
BM 598
BM 607
BM 600
1
2


REACH C-1
I.P. 1
I.P. 2
Hampton Corners
Canaseraga
Creek
Shaker Crossing
LEICESTER
GENESEE
Junction
BM 587
Mount Morris
Buck Run
Creek
1000
0


REACH C-2
REACH C-3
I.P. 1
I.P. 2
I.P. 3
4
6
560
CANADERAGA
CANAL
Keshequa
ERIE
LACKAWANNA
Flow
Creek
Sonyea
Craig Colony
CENTRAL
BM
625
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET


H C-2
8
6
Flow
Canaseraga
Brodner
LACKAWANNA
PIONEER RD.
REACH C-4
REACH C-3
I.P. 6
I.P. 4
I.P. 3
Sonyea
Cross Corners
Creek
Dugmile
Creek
Disposal
Crank Colony
BM 6.30
NOTE:
FOR LEGEND SEE PLATE 28
FLOODED AREA IS TAILWATER
FROM GENESEE RIVER.



E PLATE 28
IS TAILWATER
RIVER.

PLATE 33

5

FLOOD EMERGENCY PLAN FOR MOUNT MORRIS DAM

GENESEE RIVER WATERSHED, NEW YORK

1980
Revised 1984
(Provided under separate cover)

APPENDIX A

HYDROLOGY

AND

HYDRAULICS

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Table of Contents

Table of Contents (Cont'd)

FLOOD EMERGENCY PLAN FOR
MOUNT MORRIS DAM

APPENDIX B

EMERGENCY IDENTIFICATION SUBPLAN

B1. INTRODUCTION

B1.1 General.

Conditions affecting the operation of Mt. Morris Dam and Reservoir could result in hazards to life and property due to high water levels and sudden release of large volumes of water. Early identification of the existence of, or the potential for, such conditions occurring is essential as a basis for initiating emergency operations, for considering required repairs, and for issuing appropriate notifications to potentially affected parties and higher authority.

B1.2 Purpose.

In accordance with "Flood Emergency Plans, Guidelines for Corps Dams" 1/, this subplan of the Mount Morris Dam Flood Emergency Plan implements one portion of the Corps of Engineers' program to prepare a flood emergency plan for each Corps of Engineers' dam. This subplan describes procedures and means for assuring reliable identification and evaluation of potential, impending and existing emergency situations affecting the operation and safety of Mt. Morris Dam. The other subplans pertain to emergency operations and repairs, notification, and evacuation.

B1.3 Scope.

a. This subplan provides for identification and evaluation of potential, impending, or existing emergency situations related to:

(1) The two possible failure conditions identified in Appendix A of the Flood Emergency Plan, namely, spillway design discharge with dam failure and dam failure at full flood control pool.

(2) Spillway design discharge without dam failure and other discharges sufficiently large to cause flooding in downstream areas.

(3) Threatened or actual sabotage to project features.

b. Conditions leading to a dam failure consist of high hydrostatic loading, while accompanied by excessive seepage, increased uplift pressure, abnormal movement between adjacent monoliths, and cracking. The various circumstances and changes in the instrumentation readings, which would signal a potential dam failure, are listed in Paragraph B8.2. This subplan provides

1/ See Paragraph B10. REFERENCES

guidance in interpreting the downstream threat based on the observable data and information available at the dam.

c. Release of damaging discharges without an impending dam failure is covered in the Reservoir Regulation Manual 2/; pertinent parts are briefly highlighted or referenced in this subplan. Threatened or actual sabotage is also covered in this subplan.

d. Importantly, this subplan provides: (1) instructions for monitoring and reporting the status and conditions at the dam during high hydrostatic loadings (Paragraphs B4 & B6); (2) lines of communication between the District Office and Mt. Morris Dam during these critical times (Paragraph B7); (3) criteria for action, including declaration of an "emergency condition" (Paragraph B8); (4) procedures for activation of the "Emergency Operations and Repair Subplan" and the "Notification Subplan," Appendices C and D respectively of the Flood Emergency Plan.

B1.4 Applicability.

This subplan is applicable to all Corps of Engineers' elements concerned with the operation of Mt. Morris Dam.

B2. DEFINITIONS

B2.1 Flood Warning Condition.

A situation in which downstream flooding, influenced by releases at the dam, is likely and the loading conditions at the dam are within acceptable limits. No unusual or significant hazard to life or property is expected from the flooding. Procedures for notifying downstream interests are specified in the Notification Subplan, Appendix D, of the Flood Emergency Plan.

B2.2 Emergency Condition.

A situation in which the loading conditions at the dam meet or exceed the predetermined safe limits outlined in this Appendix. Significant hazard to life or property is possible or certain to occur. Conditions justifying declaration of an "emergency condition" may be imminent or longer term. Declaration of an "emergency condition" requires notification of others, as specified in the Notification Subplan, Appendix D, of the Flood Emergency Plan.

B2.3 Dam Foreman.

The individual in charge at the Mt. Morris Dam site is called the Dam Foreman. He may also be referred to as the Dam Tender (Used in both the Reservoir Regulation Manual 2/ & the Operations and Maintenance Manual 3/), or Maintenance Worker Foreman (Personnel Office's position title).

B2.4 District.

Depending upon which is appropriate for the current situation, the District may be one or more of the following offices, from the normal Buffalo District organization, which are responsible for implementing this subplan:

a. District Commander - for declaration of a "flood warning condition" or an "emergency condition."

b. Lower Great Lakes Hydraulics and Hydrologic Engineering Branch, particularly the Water Control Section - for matters involving reservoir regulation.

c. Design Branch, particularly the O&M Support Section and Geotechnical Section - for matters involving structural integrity.

d. Maintenance and Operations Branch - for matters involving direct operations and maintenance at the dam. All guidance or directions for the Dam Foreman will be coordinated through the Maintenance & Operations Branch.

e. Emergency Management Division - for matters involving establishing and operating the Emergency Operations Center.

B2.5 Spillway Design Discharge With Dam Failure.

An assumed emergency condition, caused by a wide breach in the dam, when monolith sections are forced apart by escaping water in about 0.1 hour, while the reservoir water surface is at an elevation of 793.3 feet USC&GS/above msl* with the corresponding peak outflow of 1,850,000 cfs. The limits of this flood are shown on Plates 28 to 33 of the Main Report.

B2.6 Dam Failure at Full Flood Control Pool.

An assumed emergency condition, caused by a wide breach in the dam, when the monolith sections are forced apart by escaping water in about 0.1 hour, while the reservoir water surface is at the spillway crest elevation of 760.0 feet with the corresponding peak outflow of 1,090,000 cfs. The limits of this flood are not shown on Plates 28 to 33 of the Main Report, because they are inside the limits of the "Spillway Design Discharge with Dam Failure" flood, which is more extensive.

B2.7 Spillway Design Discharge Without Dam Failure.

An extensive downstream flooding condition, caused by the reservoir water surface reaching an elevation of 793.8 feet, with the corresponding peak outflow of 442,000 cfs. The limits of this flood are shown on Plates 28 to 33 of the Main Report.

* United States Coast & Geodetic Survey/above mean sea level - Both designations apply to all listed elevations and are used synonymously in this Appendix and other documents.

B3. RESPONSIBILITIES

B3.1 Dam Foreman (as defined in Paragraph B2.3)

a. Perform routine observations and tests (Paragraph B4.1).

b. Assess the status of the dam and its downstream effects.

c. Perform nonroutine observations and tests as directed by the District (Paragraph B4.2).

d. Advise District of potentially hazardous situations, such as sudden development of new cracks, widening of any existing cracks, or large increase in seepage.

e. Maintain records of communications (Paragraph B5).

f. Notify the District if any part of communication system fails.

g. Act independently, in rare cases, when communications are disrupted or lost, or the circumstances are considered urgent, to declare a "flood warning condition" or an "emergency condition."

h. Act independently, in rare cases, when communications are disrupted or lost, or the circumstances are considered urgent, to activate the "Emergency Operations and Repair Subplan" and the "Notification Subplan," Appendices C and D respectively of the Flood Emergency Plan.

B3.2 District (as defined in Paragraph B2.4).

a. Provide a listing of the "flood warning" and "emergency" conditions that could occur, along with the data needed to assess the situation (Paragraph B8.2).

b. Carry out routine monitoring of conditions potentially affecting regulation of Mt. Morris Dam (Paragraph B6.1).

c. Alert the Dam Foreman about situations requiring increased readiness and, if necessary, 24-hour supervision.

d. Provide guidance to the Dam Foreman on all potentially hazardous situations which arise.

e. Provide repairs (by District personnel or through commercial source) to communication system, if any part of the system fails.

f. Direct any nonroutine observations and tests needed to assist in identification, confirmation, or analysis of existing or impending threats to safe operation of the dam (Paragraph B6.2).

g. Provide personnel for on-site evaluation of potentially hazardous conditions relating to geology, structural stability, and other aspects requiring expert analysis.

h. Declare the existence of a "flood warning condition" or an "emergency condition." (Paragraph B8).

i. Direct the activation of both the "Emergency Operations and Repair Subplan" and "Notification Subplan," Appendices C and D respectively of the Flood Emergency Plan.

j. Activate and manage the Emergency Operations Center.

k. Maintain this subplan (Paragraph B9).

B4. OBSERVATIONS, TESTS, REPORTS, AND ALERTS BY DAM FOREMAN

B4.1 Routine Observations and Tests.

The routine observations and tests that the Dam Foreman must perform to help evaluate and maintain the dam are summarized below. Details concerning each, except items (3) and (4) under "c. Weekly," can be found in either the Operations and Maintenance Manual (O) 3/ or the Reservoir Regulation Manual (R) 2/. Items (3) and (4) under "c. Weekly" below were added based on staff recommendations during preparation of this Appendix.

a. Daily:

(1) Precipitation, temperature, stage at Mount Morris, and snow depth, if any, reported (by telephone) to NWS (National Weather Service) at Buffalo.(R, Chapter IV, Para. 2.)

(2) Water level in sump pit and float well chamber. (O, Part 5, Para. 3)

(3) Headwater elevation, tailwater elevation, reservoir inflow and outflow, and flow at Jones Bridge, (by mail on NCB Form 593) to Water Control Section. (R, Chap. IV, Para. 3)

b. Three Times Per Week.

(1) Headwater elevation, tailwater elevation, gate settings, inflow, outflow, stage at Jones Bridge (by telephone or radio), to Water Control Section. (R, Chap. IV, Para.2)

(2) Uplift pressure, when headwater above elevation 650 feet. (O, Part 14, Para. 8)

(3) Plumb line readings, when headwater above elevation 650 feet. (O, Part 14, Para. 8)

c. Weekly:

(1) Service and emergency gate operated and checked for proper operation, except during high water periods. (O, Part 4, Para.3(a)).

(2) Oil pumps operated (alternately) for each opening or closing of gates. (O, Part 4, Para. 2(a)).

(3) Seismic instruments checked, plus as needed when an event has occurred (added).

(4) Radio communications tested and operated (added).

d. Monthly:

(1) Engine/generator unit 10-minute operation and test without load in months other than March and September. (0, Part 6, Para. 3(b)). (See "f. Semiannually" below)

(2) Emergency lights. (0, Part 21, Para.3)

(3) Differential joint measurements. (0, Part 14, Para. 8)

(4) Upper Gallery crack measurements. (0, Part 14, Para. 8)

e. Bimonthly:

(1) Plumb line readings (three times/week when headwater above elevation 650 feet). (0, Part 14, Para. 8)

f. Semiannually:

(1) Electrical equipment inspected and tested. (0, Part 6, Para.3)

(2) Float wells inspected and cleaned in April and October. (0, Part 12, Para. 3).

(3) Engine/generator unit 4-hour operation and test with load in March and September. (0, Part 6, Para. 3(a)).

g. Annually:

(1) Penstock inspected to observe condition of bulkhead, concrete surfaces and drains. (0, Part 13, Para. 2)

(2) Uplift pressure gage tests. (0, Part 14, Para. 4(c)).

B4.2 Nonroutine Observations and Tests.

a. When communications between dam and Water Control Section cannot be established and headwater pool is above elevation 725 feet and rising, evaluate existing conditions (both pool elevation and the rate of rise of headwater pool) and adjust gate openings according to the Reservoir Regulation Manual 2/, Plate A-1 (Emergency Operation), and Table A-2 (Sluice Discharge Table).

b. Watch for evidence of new cracks in dam and monitor existing cracks in dam, noting if they widen or propagate. Crack monitoring is an important task needed to foretell potential problems or dam failure.

c. After an earthquake has occurred,

(1) Examine seismic instruments to note if the event was recorded.

(2) Quickly observe any physical changes which occurred that could affect the overall integrity. For example, note propagation of existing cracks, appearance of new cracks, and changes along the abutments. If structure appears intact, notify Water Control Section and obtain instructions regarding rate of reservoir storage evacuation. (Reservoir Regulation Manual 2/, Page A-3).

d. Closely monitor all gages, particularly those upstream of the dam, when significant rain is occurring or forecasted. Plate 27 of the Reservoir Regulation Manual 2/ shows the location of the 18 precipitation gages in the Genesee River Basin. Plate 28 of the Manual 2/ shows the location, and lists the name and phone number, of the 12 stream gages and 6 lake stage gages in the Genesee River Basin. The gages are monitored daily. In addition, rainfall observers report if 0.50-inch or more has occurred.

e. When pool elevation reaches or exceeds elevation 725 feet,

(1) Increase observation of seepage inflow to the sump chamber at least once per shift.

(2) Read uplift pressures in monolith 11 at least once per shift.

f. Perform other observations and tests as directed by the District, including condition of trash boom.

B4.3 Reports and Charts.

The reports and charts summarized below are associated with the various inspections and tests listed above. Details concerning each can be found in either the Operations and Maintenance Manual (O) 3/ or the Reservoir Regulation Manual (R) 2/.

a. NCB Form 593 - Computation of Hourly Reservoir Inflow - maintained and submitted daily, by mail to Water Control Section. (R)

b. NCB Form 596 - Plumb Line Observations - submitted bimonthly, and three times/week when headwater above elevation 650 feet, by mail to O&M Support Section. (O)

c. NCB Form 735 - Instrumentation Form for Recording Observations - Uplift Pressure Cells - submitted three times/week when headwater above elevation 650 feet, by mail to O&M Support Section. (O)

d. NCB Form 597 - Instrumentation Form for Recording Observations - Monolith Differential Joint Movement - submitted monthly, by mail to O&M Support Section. (O)

e. Log of Gate Tests - Quarterly Report - submitted by mail to Maintenance and Operations Branch. (O)

f. Upper Gallery Crack Measurement - submitted monthly, by mail to O&M Support Section. (O)

g. Log of Seismic Instrument Inspections - submitted weekly by mail to Geotechnical Section, plus as needed when an event has occurred (proposed).

h. Sump Gage Chart - continuous run - submitted weekly, by mail to O&M Support Section. (O)

i. Jones Bridge Gage Chart - continuous run - submitted monthly, by mail to Water Control Section. (O)

j. Headwater Gage - continuous run - submitted monthly, by mail to Water Control Section. (O)

k. Tailwater Gage - continuous run - submitted monthly, by mail to Water Control Section. (O)

l. Precipitation Gage - continuous run - submitted by mail as directed to National Weather Service. (R)

B4.4 Alerts.

a. Requirements defining when alerts must be issued by the District and/or Dam Foreman are provided in the 1978 Reservoir Regulation Manual 2/. Both the "procedures for warning downstream interests," and the "reporting procedure in the event of actual or potential dam failure," that are currently contained in the Manual 2/, will be superseded by the "Notification Subplan," Appendix D, of the Flood Emergency Plan. Currently, the Manual 2/ requires that the listed agencies must be notified if (1) "reservoir releases must be made which exceed the recommended maximum rate of flow change from the dam (3,000 cfs/6 hrs)", (2) "releases must be made which will exceed channel capacity downstream," (3) "failure of the dam should occur, or appear imminent, as a result of rapidly increasing rates of seepage or observation of new cracks in the structure, and the elevation of the reservoir pool is above 600 feet msl (scenic pool)."

b. The notification procedures for flooding downstream and dam failure are now provided in Appendix D ("Notification Subplan") of the Flood Emergency Plan. Appendix D provides the basis and procedures for all notifications/alerts to Federal and non-Federal officials and other downstream parties about an existing or impending emergency. Appendix D also identifies the parties to be notified, lists the persons to be contacted, gives the means of communication to be used, and gives the procedures to confirm the receipt of notification.

B5. RECORDS

The Dam Foreman will keep a detailed log of all telephone, radio, or other communications received from or sent to the District and National Weather Service. The log should be maintained in a bound ledger or notebook used only as an official diary. Each item of communication will be described and will include:

a. Date
b. Time

c. Name of caller or person called
d. Information transmitted
e. Action requested by District
f. Action taken responding to request
g. Results of action taken
h. Remarks
i. Initials of person(s) involved

B6. OBSERVATIONS, TESTS, AND ALERTS BY DISTRICT

B6.1 Routine Observations and Tests.

Lower Great Lakes Hydraulics and Hydrologic Engineering Branch, particularly the Water Control Section, will continually:

a. Monitor river stages and discharges (particularly when substantial runoff occurs), using the telemark gages, and record readings on internal form (Plates 28 and 41 in Reservoir Regulation Manual 2/), so flood control decisions can be made.

b. Evaluate precipitation reports and forecasts, as furnished by the National Weather Service.

c. Evaluate headwater elevation, tailwater elevation, gate settings, reservoir inflow and outflow, flow at Jones Bridge, reported daily on NCB Form 593 or periodically by phone or radio by Dam Foreman.

d. Make and evaluate runoff forecasts, based on results obtained from the computer program entitled "HEC-1 Flood Hydrograph Package" 4/, as a supplement to National Weather Service in the event of major floods.

B6.2 Nonroutine Observations and Tests.

Engineering Division will continually specify additional observations and tests to be provided by the Dam Foreman, and make additional observations and tests as necessary to:

a. Assure proper functioning of all instrumentation

b. Assist in identification, confirmation, or analysis of existing or impending threats to safe operation of the dam.

c. Predict inflows and outflows in the event that existing gages/instrumentation are rendered inoperable during a high water situation.

B6.3 Alerts.

Emergency Management Division will provide alerts to the Dam Foreman and appropriate District personnel when:

a. Weather and other factors require heightened readiness, increased surveillance, or the possible need for activation of the Emergency Operations Center.

b. Consideration is being given to declaration of a "flood warning condition" or an "emergency condition." (Paragraph B8)

B7. COMMUNICATIONS

NCB Plan 500-1-2, Emergency Communications Manual 5/, provided within NCB Plan 500-1-1 6/, describes the District's communication system and procedures for its use during disasters or emergencies. In general, the following procedures apply:

B7.1 Normal Procedures.

Communications between the District and the Dam Foreman will normally be by telephone. According to Appendix A of the Reservoir Regulation Manual 2/, Water Control Section personnel (in the order listed below) will be notified outside normal duty hours, by the National Weather Service, if flooding or a severe storm condition develops. Whenever a "flood warning condition" or an "emergency condition" has been declared (Paragraph B8) at Mt. Morris Dam or at any other location that can be affected by the dam's operation, telephones at the dam and the District's Emergency Operations Center will be manned on a 24-hour basis.

Name	Office Ext.	Residence
William Erdle	2257	716-992-9960
Anthony Eberhardt	2258	716-662-7729
Andrew Piacente	2259	716-773-2414

B7.2 Backup Procedures.

The radio communications network between the District and Dam Foreman will be used to backup telephone communications. Whenever telephone service is disrupted, while a "flood warning condition" or a "emergency condition" has been declared (Paragraph B8) at Mt. Morris Dam, or at any other location that can be affected by the operation of the dam, radio communications at the dam and the District's Emergency Operations Center will be manned on a 24-hour basis. The following facilities are available as indicated in NCB Plan 500-1-2 5/, Appendix D:

Installation	Call Sign	VHF/FM(1) F1-F2	SSB (2)
Dist. Office	WUD-2	-	X
Black Rock Lock	WUD-21	X	-
Mt. Morris Dam	WUD-22	X	X

(1) F_1 - 163.4125 MHz
F_2 - 165.0875 MHz
(2) Monitored - 5400 KHz USB

B7.3 Emergency Procedures.

During any situation when both telephone and radio communications between the District and the dam are lost or disrupted, the following non-district sources, equipped with telephone and/or radio facilities, will be called upon for assistance:

New York State Police	(716-243-2200)
Livingston County Sheriff	(716-243-1212)
Mt. Morris Police	(716-658-2155)
Letchworth State Park Police	(716-493-2611)

NCB Plan 500-1-2 5/ should be consulted for a more complete list, additional sources and guidance.

B8. DECLARATION OF FLOOD WARNING AND EMERGENCY CONDITIONS

B8.1 Responsibility.

The District is responsible for the declaration of a "flood warning condition" or "emergency condition" in all but the rare cases where the loss of communication, or the urgency or a situation, prevents the Dam Foreman from conferring with the District. When possible, "flood warning" and "emergency" declarations will be made by the District Commander. A "Decision Group," consisting of the Chief of Engineering Division, Chief of Lower Great Lakes Hydraulics and Hydrologic Engineering Branch, Chief of Construction-Operations Division, Chief of Maintenance & Operations Branch, and Chief of Emergency Management Division, will provide input to the District Commander, within the decision-making process prior to issuance of the declarations.

B8.2 Circumstances Warranting Declaration.

Every situation requiring a declaration of a "flood warning condition" or an "emergency condition" cannot be specified. All involved personnel must exercise their initiative and judgment. Each situation must be judged individually on the basis of all relevant factors available at the time.

a. Examples of circumstances warranting declaration of a "flood warning condition," beyond those specifically identified in the Reservoir Regulation Manual 2/, include:

(1) Malfunction of the gate system during flood operations, with pool level at or above elevation 700 feet (storage at about 50 percent of capacity), impeding the release of water and creating a potential for spillway flow.

(2) Break in the debris boom when pool level at or above elevation 740 feet.

(3) Pool level at or above elevation 740 feet (storage at about 80 percent of capacity) with either inflow exceeding outflow capacity or a forecast of significant inflows from precipitation and/or snowmelt.

b. Examples of circumstances warranting declaration of an "emergency condition" include:

(1) Imminent or occurring spillway flow including pool level at or above elevation 760 feet (storage at 100 percent of capacity) and inflow greater than 23,770 cfs, the maximum discharge possible through the nine gated conduits.

(2) Fresh cracks appearing in either or both abutments, particularly when pool level is above elevation 650 feet.

(3) Pool level at elevation 750 feet (storage at about 90 percent of capacity) with forecast of significant inflows from precipitation and/or snowmelt to cause spillway flow, while the gate system is inoperative.

(4) Threats or occurrence of sabotage to critical project features, while pool elevation is above elevation 650 feet.

(5) Sudden or extraordinary changes in instrumentation readings or readings above the predetermined limits as listed in Paragraph B8.2c below.

c. Sudden or extraordinary changes in the instrumentation readings will signal the onset of an "emergency condition" at Mount Morris Dam. When the changes listed below are coupled with a reservoir pool above elevation 650 feet, a declaration will be confirmed:

(1) Sump water inflow (in Monolith 6) - used to measure leakage from foundation drains, indicating adequacy of foundation grout curtain. Calculate flow and pump cycle time from gage chart. Consider flows greater than the listed amounts, and increasing (or inversely, pump cycle times less than the listed amounts, and decreasing) as critical.

Pool Elev. (feet)	Min. Flow (gpm)	Max. Pump Cycle Time (hours)
650	6.0	8.4
680	7.0	7.2
705	8.0	6.3
730	9.0	5.6
760	10.0	5.0

(2) Uplift pressure (under Monoliths 4 and 11) - used to ascertain the hydrostatic head on the monoliths. Plot water elevations calculated from pressure cell readings, and headwater/tailwater elevations, on monolith cross-section which has relative location of the pressure cells. Consider plot at or above theoretical limit (the straight line between headwater and tailwater elevations) as critical.

(3) Plumb line (in Monolith 11) - used to detect differential movement/deflection of top of dam with respect to bottom. Calculate deflection from average of readings. Positive deflection indicates upstream tilt; negative deflection indicates downstream tilt. Plotting deflection, temperature, and

pool elevation versus time has shown that deflection is directly affected by temperature. Since all deflections have been positive, consider negative deflections as potentially critical. Consider large increases in negative deflections as critical.

(4) Differential joint movement (between adjacent monoliths) - used to measure the three-dimensional movements of an individual monolith with respect to an adjoining monolith. Plot readings, taken longitudinally, vertically, and transversely, versus time. Consider consecutive incremental increases greater than 0.05-inch between readings in any direction as critical.

(5) Upper gallery crack (in monoliths 6 to 16) - used to measure movement or enlargement of the crack on the downstream side of the spillway. Plot readings and temperature versus time. Doing so has shown that readings are directly affected by temperature. Since changes between readings have been relatively small, consider consecutive incremental increases greater than 0.05-inch between readings as critical.

B8.3 Action Upon Declaration.

a. Dam Foreman

(1) Monitor telephones on a 24-hour basis.

(2) Activate appropriate portions of both the "Emergency Operations and Repair Subplan" and "Notification Subplan", Appendices C and D respectively of the Flood Emergency Plan, that apply to Dam Foreman. Include alerts to downstream interests (Paragraph B4.4).

(3) Maintain 24-hour surveillance of the situation responsible for the declaration.

(4) Perform both routine and nonroutine observations and tests as directed by the District.

(5) Test radio communications, and notify District if any part of system fails.

(6) Request assistance needed from District to perform above items.

b. District.

(1) Issue operational directives and make decisions in overall management and control of emergency activities (District Commander).

(2) Activate and manage the Emergency Operations Center (Emergency Management Division).

(3) Monitor telephones on a 24-hour basis (Emergency Management Division).

(4) Test radio communications (Construction-Operations Division).

(5) Augment and expand communication facilities as authorized by District Commander (Emergency Management Division).

(6) Place key staff on standby for emergency duty (Engineering Division and Construction-Operations Division).

(7) Provide detailed instructions to Dam Foreman for any additional observations and tests (Engineering Division).

(8) Dispatch personnel to dam site as required to provide expert evaluation of situation and to assist Dam Foreman as needed (Engineering Division and Construction-Operations Division).

(9) Assign a technical liaison to each county disaster office to assist them in the interpretation of hydrologic events (Emergency Management Division).

(10) Activate appropriate portions both of the "Emergency Operations and Repair Subplan" and "Notification Subplan", Appendices C and D respectively of the Flood Emergency Plan, that apply to District (all involved offices).

B9. SUBPLAN MAINTENANCE

B9.1 Updating.

The Chief, Engineering Division has overall responsibility for maintaining this subplan. This subplan shall be reviewed and updated, as needed, through his Chief, O&M Support Section, who will coordinate with the Chief, Lower Great Lakes Hydraulics and Hydrologic Engineering Branch; Chief, Maintenance and Operations Branch; Chief, Emergency Management Division, at the following times:

a. Annually reviewed, but updated whenever necessary.

b. Whenever needed by modifications in instrumentation at, or affecting, the project.

c. Whenever changes occur in the dam operation procedures, or the overall District emergency procedures.

B9.2 Inspection and Testing.

a. The Chief, Engineering Division shall annually prescribe a thorough inspection of all mechanical, electrical, and other equipment pertinent to conduct of this subplan. The inspection shall include all tests, servicing, and calibrating necessary to ensure proper functioning of the project.

b. The Chief, Construction-Operations Division shall ensure that the inspection is conducted by the Chief, Maintenance and Operations Branch and attended by the Dam Foreman and, as necessary, by other District Construction-Operations personnel to assure themselves that the project is fully functional.

c. The Chief, Engineering Division shall ensure that the Chief, Maintenance and Operations Branch is assisted by the Chief, Design Branch and that the inspections are attended by District Engineering personnel, as necessary.

B9.3 Familiarization.

a. The Chief, O&M Support Section, shall ensure that all current District personnel from the Lower Great Lakes Hydraulics and Hydrologic Engineering Branch, Maintenance and Operations Branch, Design Branch, and Emergency Management Division involved with Mt. Morris Dam are aware of, and familiar with, this subplan by:

(1) Circulating each updated version for their review and signature.

(2) Conducting a periodic, annual review session with them in attendance.

b. The Chief, Great Lakes Hydraulics and Hydrologic Engineering Branch, and the Chief, Maintenance and Operations Branch, shall brief all their new personnel involved with Mt. Morris Dam concerning this subplan, particularly:

(1) New personnel within two weeks of assuming their duties.

(2) New Dam Foreman before assuming his duties.

B10. REFERENCES

1/ Flood Emergency Plans, Guidelines for Corps Dams (Corps of Engineers, HEC, Davis, CA, June 1980, Second Edition - July 1982).

2/ Reservoir Regulation Manual, Mount Morris Dam and Reservoir (U.S. Army Engineer District, Buffalo, September 1978).

3/ Mt. Morris Lake, Operations and Maintenance Manual (Corps of Engineers, Buffalo District, October 1978).

4/ HEC-1 Flood Hydrograph Package, Computer Program 723-X6-L2010 (Corps of Engineers, Davis, CA, January 1973).

5/ Emergency Communications Manual, NCB Plan 500-1-2 (Corps of Engineers, Buffalo District, July 1984).

6/ Natural Disaster Activities Under PL 84-99 and PL 93-288, NCB Plan 500-1-1 (Corps of Engineers, Buffalo District, October 1981).

FLOOD EMERGENCY PLAN FOR MOUNT MORRIS DAM

GENESEE RIVER WATERSHED, NEW YORK

1984
Revised 1985

APPENDIX C

EMERGENCY OPERATIONS AND REPAIR SUBPLAN

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

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FLOOD EMERGENCY PLAN
FOR MOUNT MORRIS DAM

APPENDIX C
EMERGENCY OPERATIONS AND REPAIR SUBPLAN

C1. INTRODUCTION

C1.1 General.

Conditions affecting the operation of Mt. Morris Dam and Reservoir could result in hazards to life and property due to high pool levels and sudden release of large volumes of water. Prompt conduct of emergency operations and consideration or performance of needed repairs are essential for minimizing hazards to life and property and returning the dam to its original condition. The dam does not have any feature to quickly dewater the reservoir during emergency conditions. With nine 5-foot by 7-foot outlet conduits, the discharge capacity is only 23,700 cfs at a pool elevation of 760 feet. In most situations, essential repairs will be provided after the emergency situation subsides.

C1.2 Purpose.

In accordance with "Flood Emergency Plans, Guidelines for Corps Dams 1/", this subplan of the Mount Morris Flood Emergency Plan implements one portion of the Corps of Engineers' program to prepare a flood emergency plan for each Corps of Engineers' dam. Procedures for emergency operations and consideration of needed repairs to deal with potential, impending, and existing emergency situations affecting the operation and safety of Mt. Morris Dam are established in this subplan. The other subplans pertain to emergency identification, notification, and evacuation.

C1.3 Scope.

This subplan discusses the reservoir regulation capability available at Mt. Morris Dam, detailed in the Reservoir Regulation Manual 2/, and specifies the emergency operations to be implemented and repairs to be considered upon declaration of a "flood warning condition" or an "emergency condition". Emergency operations, and repairs as needed, are described for cases of high reservoir level (Paragraph C6), excess seepage or malfunction of internal drainage system (Paragraph C7), threatened or actual sabotage (Paragraph C8), malfunction of gate system (Paragraph C9), spillway discharges (Paragraph C10), and dam failure/break at high pool levels (Paragraph C11). Whenever the pool is above the spillway elevation, repairs are minimal with no plans for alleviating flooding downstream.

C1.4 Applicability.

This subplan is applicable to all Corps of Engineers' elements concerned with the operation of Mt. Morris Dam.

1/ See Paragraph C13. REFERENCES

C2. DEFINITIONS

C2.1 Flood Warning Condition.

A situation in which downstream flooding, influenced by releases at the dam, is likely, and the loading conditions at the dam are within acceptable limits. No unusual or significant hazard to life or property is expected from the flooding. Procedures for notifying downstream interests are specified in the Notification Subplan, Appendix D, of the Flood Emergency Plan.

C2.2 Emergency Condition.

A situation in which the loading conditions at the dam meet or exceed the predetermined safe limits outlined in the Emergency Identification Subplan, Appendix B, of the Flood Emergency Plan. Significant hazard to life or property is possible or certain to occur. Conditions justifying declaration of an "emergency condition" may be imminent or longer term. Declaration of an "emergency condition" requires notification of others, as specified in the Notification Subplan, Appendix D, of the Flood Emergency Plan.

C2.3 Dam Foreman.

The individual in charge at the Mt. Morris Dam site is called the Dam Foreman. He may also be referred to as the Dam Tender (used in both the Reservoir Regulation Manual 2/ and the Operations and Maintenance Manual 3/) or Maintenance Worker Foreman (Personnel Office's position title).

C2.4 District.

Depending upon which is appropriate for the current situation, the District may be one or more of the following offices, from the normal Buffalo District organization, which are responsible for implementing this subplan:

a. District Commander - for declaration of a "flood warning condition" or an "emergency condition."

b. Lower Great Lakes Hydraulics and Hydrologic Engineering Branch, particularly the Water Control Section - for matters involving reservoir regulation.

c. Design Branch, particularly the O&M Support Section and Geotechnical Section - for matters involving structural integrity.

d. Maintenance and Operations Branch - for matters involving direct operations and maintenance at the dam. All guidance or directions for the Dam Foreman will be coordinated through the Maintenance & Operations Branch.

e. Emergency Management Division - for matters involving establishing and operating the Emergency Operations Center.

C3. BASIS OF ACTIVATION

This subplan shall be activated immediately upon declaration of a "flood warning condition" or an "emergency condition." Appendix B, "Emergency Identification Subplan", of the Flood Emergency Plan defines the responsibility for the declarations, lists examples of circumstances warranting declaration, and provides the actions required upon declaration.

C4. RESPONSIBILITIES

C4.1 Dam Foreman (As defined in Paragraph C2.3).

a. Provide information to District on current severity and rate of change of the problem.

b. Request needed assistance from District, including personnel, equipment and materials, and repairs outside his capability.

c. Carry out emergency operations, and perform repairs within capability, as directed by District.

d. Act independently to implement emergency operations and perform repairs within capability, when communications with the District are disrupted or immediate action is required in:

(1) Deciding the urgency of correction.

(2) Carrying out appropriate emergency operations and repairs for the type of emergency.

(3) Obtaining needed personnel, equipment and materials.

C4.2 District (As defined in Paragraph C2.4).

a. Assess the problem and Dam Foreman's request for assistance concerning:

(1) Urgency for correction.

(2) Type of corrective actions required.

(3) Personnel required for corrective actions.

(4) Equipment and materials required for corrective actions.

b. Provide direction to the Dam Foreman on implementing emergency operations and performing repairs within his capability.

c. Dispatch needed personnel, equipment and materials to the project site.

d. Arrange for needed personnel, equipment and materials from other sources, including repairs outside the capability of the Dam Foreman.

e. Maintain this subplan.

C5. RESERVOIR REGULATION PLAN

C5.1 General.

a. Mt. Morris Dam does not have any feature to evacuate the reservoir other than the nine outlet conduits which have a discharge capacity of 23,700 cfs at the full pool elevation of 760 feet. The pool will rise, if inflow exceeds the discharge capacity of the outlet conduits for any particular pool elevation. The plan provides guidance to lower the water level of the reservoir under lower inflow rates. Evacuation of flood control storage is accomplished by opening one or more outlet gates, depending on the required rate of dewatering.

b. The Reservoir Regulation Manual for Mt. Morris Dam 2/ provides detailed requirements for both normal and emergency dam operations.

c. The rate of releasing the flood control storage through the outlets will be directed by the District, so long as communications between the Dam Foreman and the District are intact. Releases may be determined and undertaken on the Dam Foreman's initiative, if communications with the District are disrupted.

C5.2 Procedure for Determining Outlet Releases.

a. Determine outflow rate required in accordance with the Reservoir Regulation Manual 2/.

b. Determine duration of releases required.

c. Formulate and issue warning messages for downstream areas when required.

d. Notify the appropriate agencies as soon as possible in conjunction with subparagraph C5.2c above. Consult Appendix D, "Notification Subplan," of the Flood Emergency Plan.

e. Initiate opening correct number of gates determined from the Reservoir Regulation Manual 2/, Table A-2, "Sluice Discharge Table," which relates pool elevation with release discharge rate.

C5.3 Specified Discharge Rates.

a. The Reservoir Regulation Manual 2/, Table 5, lists both the bankfull and safe capacities of the channel downstream from the dam as follows:

Location	River Mile *	Bankfull Capacity, cfs	Safe Capacity, cfs
Rochester	0-6	40,000	33,000
Rochester	6-10	55,000	55,000
Genesee Valley Park	10-14	20,000	20,000
Barge Canal Crossing	11.6	50,000	5,000 (1)
Black Creek - Oatka Creek	14-22	20,000	20,000
Oatka Creek - Avon	22-35	15,000	10,500 (3)
Avon - Jones Bridge	35-61	12,400 (2)	12,400

* River Mile - Distance along stream channel from mouth in miles. Mt. Morris dam is located at River Mile 66.9.

(1) Capacity at which river velocity is too great to allow traffic to cross the Genesee River.

(2) Capacity in Jones Bridge Area; remainder of the reach has bankfull capacity of 15,000 cfs.

(3) Lowest channel capacity of any area downstream of Mt. Morris Dam is at the Avon gaging station, which becomes a critical control point during flood periods and the primary control point during evacuation periods from the reservoir.

b. Outflow discharges will be limited to the above safe capacities downstream, unless an "emergency condition" has been declared and/or a dam failure is imminent.

C6. EMERGENCY OPERATIONS AND REPAIRS - HIGH RESERVOIR LEVEL

C6.1 Potential Problems.

a. Large hydrostatic force on the dam.

b. Dam's inability to impound major inflows without overtopping or uncontrolled spillway flow.

c. Increase in normal seepage.

d. Less freeboard available to contain wave action.

e. Significant amount of floatable debris restrained by a debris boom upstream of the dam. If not restrained during spillway flows (Paragraph C10), debris could cause serious downstream jams and flooding.

f. Submerged and killed vegetation on valley walls. Eventually, it becomes a part of the debris problem.

C6.2 Recommended Emergency Actions.

The only available action for reducing high water levels is the increasing of reservoir releases through the outlet conduits. This should be done in accordance with the Reservoir Regulation Manual 2/ briefly outlined in Paragraph C5 of this subplan. This is only effective or applicable when the pool level is below elevation 760 feet and outflow exceeds the inflow. During all other events when pool is above elevation 760 feet, the District can only monitor the structural stability of the dam, and advise the local downstream interests, about the anticipated extent of flooding, through the Notification Subplan, Appendix D, of the Flood Emergency Plan.

C7. EMERGENCY OPERATIONS AND REPAIRS - EXCESS SEEPAGE OR MALFUNCTION OF INTERNAL DRAINAGE SYSTEM

C7.1 Potential Problems.

a. Rapid and/or significant increases or decreases in the amount of flow through foundation drains into the sump pit. An increase can indicate ineffectiveness of grout curtain. A decrease can indicate plugged drains and no relief of uplift pressure.

b. Sump pit's inability or failure to function properly and handle excess seepage, allowing the dam to fill with water.

c. Significant accumulation of solid matter in the foundation drains and sump pit.

d. Increased leakage at joints and cracks.

C7.2 Recommended Emergency Actions.

Lowering of the reservoir pool level reduces the pressure on the seepage areas, thereby reducing the seepage into the drainage system. This should be done in accordance with the Reservoir Regulation Manual 2/ specified in Paragraph C5 of this subplan. Maintenance and repair of the drain and sump pump system are described in the Operations and Maintenance Manual 3/. However, if new leakage was observed, the integrity of the structure must be evaluated and corrective structural measures, if necessary, must be taken after the emergency situation subsides.

C8. EMERGENCY OPERATIONS AND REPAIRS - THREATENED OR ACTUAL SABOTAGE

C8.1 Potential Problems.

a. Sabotage by professional saboteurs or terrorists is not likely to be preceded by threats. Sabotage threats will most likely be received from amateurs who lack modern weapons, high explosives or sophisticated knowledge about the design or operation of the dam. All such threats will be taken seriously. The most probable threats are those related to disruption of communications, impeding access to the project, interference with project operations, and damaging key project features affecting safety.

b. Actual sabotage may range from minor disruptions to quasi-military attacks by knowledgeable and well-equipped professionals. The effects of sabotage fall into three categories: not affecting safety of the dam, posing a minor or future safety problem, and posing an immediate and serious safety problem.

C8.2 Recommended Emergency Actions.

a. All threats and acts of sabotage concerning Mt. Morris Dam will be reported immediately to the District and the Federal Bureau of Investigation's District office at Rochester (716-546-2220) or Buffalo (716-856-7800).

b. Immediate assistance to secure and protect the project will be requested from the law enforcement agencies listed below, if a threatened action could jeopardize the safety of visitors and dam personnel, or the downstream areas when the action is carried out:

Agency	Phone Numbers
New York State Police	
Toll Free (Emergency)	1-800-252-0820
Headquarters (Canandaigua)	716-398-3200
Livingston County (Geneseo)	716-243-2200
Monroe County (Henrietta)	716-271-4646
Livingston County Sheriff (Geneseo)	716-243-1212
Mount Morris Police	716-658-2155
Letchworth State Park Police (Castile)	716-493-2611

c. Every effort shall be made to operate Mt. Morris Dam in a manner which will avoid injury to all parties. However, the catastrophic consequences of dam failure require that actions necessary to maintain the safety of the dam must not be compromised by individuals seeking to block access to the site, limit reservoir levels or releases, or otherwise impede essential operations.

d. Immediate remedial action shall be initiated in all cases of sabotage causing an imminent or future safety problem of a serious nature. As appropriate, remedial action shall include:

(1) Declaration of an "emergency condition", and activation of the "Notification Subplan", Appendix D, of the Flood Emergency Plan.

(2) Activation of the reservoir regulation plan specified in Paragraph C5 of this subplan.

(3) Initiation of emergency repairs according to the nature of the damage. However, any major structural repairs will be made after the emergency subsides.

C9. EMERGENCY OPERATIONS AND REPAIRS - MALFUNCTION OF GATE SYSTEM

C9.1 Potential Problems.

a. Inability or reduced ability to control pool level and evacuate flood storage in the reservoir (Paragraph C5).

b. High reservoir levels (Paragraph C6) and resulting potential problems.

C9.2 Recommended Emergency Actions.

a. Since there are nine outflow conduits, each with a service gate and an emergency gate (upstream of service gate), the Dam Foreman has the choice of operating any particular gate or series of gates to vary or maintain the required outflow within a small and limited range. Maximum discharge is 23,700 cfs at pool elevation 760 feet. An emergency gate may be operated in lieu of a service gate.

b. If an operational problem arises with a particular gate, other gate(s) will be used. The repair work will be done immediately, if the cause of the problem can be handled by the Dam Foreman and his crew. However, major emergency work, such as repair of the hydraulic system piping and pumps, will be accomplished by an emergency contract, through the District Office.

C10. EMERGENCY OPERATIONS AND REPAIRS - SPILLWAY DISCHARGE

C10.1 Potential Problems.

a. Sizeable uncontrolled flows. The dam was designed for a spillway discharge of 320,000 cfs.

b. Significant amount of floatable bedris restrained by a debris boom upstream of dam. If not restrained, debris could cause serious downstream jams and flooding.

c. Significant downstream flooding where channel capacities are exceeded.

C10.2 Recommended Emergency Actions.

a. Through the flood warning system, established in the Notification Subplan, Appendix D, of the Flood Emergency Plan, local agencies are notified that spillway flow is imminent, so they can implement their evacuation proce-

dures and conduct other efforts such as traffic control, rescue operations, and debris removal.

b. During spillway discharge events, the District can only monitor the structural stability of the dam. The District must wait until the spillway discharge ceases and pool elevation drops, before repairing the debris boom and before removing floatable debris.

C11. EMERGENCY OPERATIONS AND REPAIRS - DAM FAILURE/BREAK AT HIGH POOL LEVELS

C11.1 Potential Problems.

a. Extremely large volume of water released within a short period of time causing severe flooding downstream.

b. Destruction of flood control structures along the river.

c. Significant physical danger to all those downstream in inundation areas defined in Appendix A and shown on Plates 28 to 33 of Main Report.

C11.2 Recommended Emergency Actions.

a. Sudden or extraordinary changes in the instrumentation readings or readings beyond the limits previously established, would foretell potential movement/failure of the dam, necessitating the declaration of an "emergency condition" (Paragraph B8.2), the notification of downstream interests (Appendix D), and implementation of their evacuation effort. Operating personnel and visitors at the dam must evacuate to high ground.

b. Once the flow through the break has subsided, structural damage will be surveyed, repairs will be designed, and appropriate construction/repair contracts will be established.

C12. INVENTORY OF RESOURCES

C12.1 General

Resources for implementing emergency operations and performing repairs are available at Mt. Morris Dam (including the Government Reservation), at the Buffalo District Office (including the warehouse and maintenance shop), and through additional sources (including contractors and suppliers).

C12.2 Resources at Mt. Morris Dam.

Item	Quantity	Location
Equipment		
Diesel - Electric Generator (Stationary - Type)	1 each	Dam
Arc Welder	1 each	Dam
Compressor	1 each	Dam
Pneumatic Tool	1 each	Dam
Outboard Motor Boat	1 each	Dam
Dewatering Pump: 8-inch	2 each	Reservation
(Crisafulli-Type) 12-inch	5 each	Reservation
Materials		
Fuel Oil	1,200 gallon	Dam
Fuel Oil	300 gallon	Garage
Sand Bags	30,000 each	Reservation
Labor		
Maintenance Worker Foreman	1 each	Dam
Maintenance Mechanic (Dam)	1 each	Dam
Maintenance Worker (Dam)	2 each	Dam

C12.3 Resources at Buffalo District Office.

Item	Quantity	Location
Equipment		
Arc Welder	2 each	Maintenance Shop
Compressor	1 each	Maintenance Shop
Dewatering Pump: 12-inch (Crisafulli-Type)	2 each	Warehouse
Materials		
Sand Bags	15,000 each	Warehouse
Labor		
Maintenance Worker Foreman	1 each	Maintenance Shop
Electrician	1 each	Maintenance Shop
Welder	1 each	Maintenance Shop
Maintenance Worker Helper	1 each	Maintenance Shop
Carpenter Worker	1 each	Maintenance Shop

C12.4 Sources of Additional Resources.

Item	Contractor/Source	Location	Phone
Heavy Construction	Cipriano Brothers, Inc.	Mt. Morris	658-2248
Heavy Construction	Yencer (Roger E.)	Mt. Morris	658-2566
Electrical Repair/ Parts	T. H. Green Electric Company	Rochester	424-3800
Elevator Service	Downey Goodlein Elevator Corp.	Rochester	328-5610
Heavy Mechanical Repair	Higgins Erectors	Buffalo/ Rochester	849-8000/ 235-8410
Large Hardware/ Mechanical Parts	Christiano A.R. Hardware & Implement Co.,Inc.	Leicester	382-3211
Fuel Oil	Buell Oil Co.,Inc.	Geneseo	243-2140
Fuel Oil	Macaluso (Frank A.)	Mt. Morris	658-4561
Granular Material/ Concrete	Cipriano Brothers, Inc.	Mt. Morris	658-2248
Sand Bags	Sterling Bag & Supply Co., Inc.	Lackawanna	826-1990 (Day)/ 876-7093 (Night)

C13. REFERENCES

1/ Flood Emergency Plans, Guidelines for Corps Dams (Corps of Engineers, HEC, Davis, CA, June 1980, Second Edition - July 1982).

2/ Reservoir Regulation Manual, Mount Morris Dam and Reservoir (U.S. Army Engineer District, Buffalo, September 1978).

3/ Mt. Morris Lake, Operation and Maintenance Manual (Corps of Engineers, Buffalo District, October 1978).

FLOOD EMERGENCY PLAN FOR MOUNT MORRIS DAM

GENESEE RIVER WATERSHED, NEW YORK

1985
Revised 1985

APPENDIX D

NOTIFICATION

SUBPLAN

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

FLOOD EMERGENCY PLAN FOR MOUNT MORRIS DAM

GENESEE RIVER WATERSHED, NEW YORK

1985
Revised 1985

APPENDIX D

NOTIFICATION

SUBPLAN

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

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FLOOD EMERGENCY PLAN FOR
MOUNT MORRIS DAM

APPENDIX D

NOTIFICATION SUBPLAN

D1. INTRODUCTION

D1.1 General.

Conditions affecting the operation of Mt. Morris Dam and Reservoir could result in hazards to life and property due to high pool levels and sudden release of large volumes of water. Prompt issuance of appropriate notification is essential for minimizing hazards to life and property.

D1.2 Purpose.

This subplan implements a portion of the Corps of Engineers program to prepare emergency plans for all Corps of Engineers dams. It establishes procedures for issuing notifications of impending and existing emergencies affecting the operation and safety of Mt. Morris Dam. The other subplans pertain to emergency identification, emergency operations and repairs, and evacuation.

D1.3 Scope.

This subplan specifies notifications and other actions to be taken upon declaration of a "Flood Warning" or "Emergency" condition. Notifications and actions specified are those necessary for:

a. Insuring safety.

b. Vacating project areas where emergency operations and repairs may be conducted.

c. Internal coordination of Corps of Engineers activities.

d. Coordination with non-Federal units of Government and other Federal agencies.

D1.4 Applicability.

This subplan is applicable to all Corps elements and field offices concerned with operation of Mt. Morris Dam.

D2. DEFINITIONS

D2.1 Flood Warning Condition.

A "Flood Warning Condition" is one in which downstream flooding, influenced by releases at the dam, is likely and the loading conditions at

the dam are within acceptable limits. No unusual or significant hazard to life or property is expected to occur.

D2.2 Emergency Condition.

An "Emergency Condition" is one in which the significant hazard to life and/or property is possible or certain to occur. Conditions justifying the declaration of an "emergency condition" may be imminent or longer term.

D2.3 Dam Foreman.

The individual in charge at the Mt. Morris Dam site is called the Dam Foreman. He may also be referred to as the Dam Tender or Maintenance Worker Foreman.

D2.4 District.

Depending upon which is appropriate for the current situation, the District may be one or more of the following offices, from the normal Buffalo District organization, which are responsible for implementing this subplan:

a. District Commander - for declaration of a "flood warning condition" or an "emergency condition."

b. Lower Great Lakes Hydraulics and Hydrologic Engineering Branch, particularly the Water Control Section - for matters involving reservoir regulation.

c. Design Branch, particularly the O&M Support Section and Geotechnical Section - for matters involving structural integrity.

d. Maintenance and Operations Branch - for matters involving direct operations and maintenance at the dam. All guidance or directions for the Dam Foreman will be coordinated through the Maintenance & Operations Branch.

e. Emergency Management Division - for matters involving establishing and operating the Emergency Operations Center (EOC).

D3. BASIS OF ACTIVATION

This subplan is to be activated immediately upon declaration of a "Flood Warning" or "Emergency Condition."

D4. PARTIES TO BE NOTIFIED

D4.1 Corps of Engineers.

Buffalo District and North Central Division personnel to be notified in case of dam problems are indicated below.

D4.1 Corps of Engineers (Cont'd)

Position	Name	Office Number	Home Number
Dam Foreman:	Myles Sinnott	716-658-4220	716-658-4762
Maintenance & Operations Supervisor:		716-876-5454	
NCBCO-MO	Donald Borkowski	Ext. 2284	716-674-1227
District Commander:		716-876-5454	
NCBDE	COL Daniel R. Clark	Ext. 2200	716-689-9004
Dam Safety Officer & Committee Chairman:		716-876-5454	
NCBED	Kenneth Hallock	Ext. 2212	716-839-4023
Dam Safety Committee Members:		716-876-5454	
NCBED-DD	Ambrose Andre	Ext. 2238	716-688-7506
NCBED-DM	George Brooks	Ext. 2231	716-694-2621
NCBED-D	Joseph Foley	Ext. 2225	716-834-6488
NCBCO	James Brade	Ext. 2297	716-835-5867
NCBED-H	Thomas Pieczynski	Ext. 2275	716-662-3688
NCBED-DF	Thomas Wilkinson	Ext. 2168	716-691-8877
Emergency Management Staff:		716-876-5454	
NCBEM	Henry Vitale	Ext. 2206	716-662-4878
NCBEM	Raymond Lewis	Ext. 2208	716-691-3538
NCDEM	Timothy Monteen	312-886-8451	312-961-2195
NCDEM	Bernard Bochantin	312-353-5275	815-568-7544

D4.2 National Weather Service.

Flood prediction, based on climatological conditions, is the responsibility of the National Weather Service (NWS). Close coordination and liaison are, therefore, required for any Corps announcements. The Memorandum of Understanding (MOU), provided at the end of this appendix, details the working arrangements between Buffalo District and NWS. The local NWS meteorologist-in-charge is Donald Weurch, who can be reached at phone number 716-632-1328.

D4.3 Other Parties.

The New York State (NYS) Emergency Management Office and the Disaster Preparedness Offices of the affected counties to be notified are indicated below. The County Coordinators will alert all downstream communities using their established notification system.

New York State Emergency Management Office - Western District - Batavia:

Fred Allein	Office:	716-343-1465
	Home:	716-343-3196

Livingston County Office of Disaster Preparedness - Geneseo:

David Harter	Office:	716-243-0510
	Home:	716-335-6873

Monroe County Office of Disaster Preparedness - Rochester:

Edward Smith	Office:	716-473-0710
	Home:	716-223-7917

D5. RESPONSIBILITY FOR NOTIFICATION

D5.1 Dam Foreman.

The Dam Foreman will immediately notify the District Office of all conditions affecting the dam. In dire situations, or when communications with the District are disrupted, he will take independent action to alert parties listed in paragaraph D4.3.

D5.2 Maintenance & Operations (M&O) Supervisor.

The M&O Supervisor will assure that all other pertinent District personnel are informed.

D5.3 Dam Safety Officer.

The Dam Safety Officer will notify North Central Division (NCD), who, in turn, will inform the Office of Chief of Engineers (OCE).

D5.4 Emergency Operations Center (EOC).

The EOC will notify the Western District Office of the NYS Emergency Management Office, who will notify the disaster coordinators of both Livingston and Monroe counties. As a back-up, the EOC will also contact the same county coordinators to verify receipt of notification. Further notification to the affected communities is the responsibility of the county coordinators. The EOC will establish liaison with the National Weather Service in accordance with the MOU.

D5.5 Public Affairs Officer (PAO).

Upon receipt of the instructions of the EOC, the PAO will make the required public announcements.

D6. COMMUNICATIONS

D6.1 Normal.

Notifications will normally be by telephone. Telephones at the dam site and the District EOC will be attended on a 24-hour basis, whenever a "Flood Warning" or "Emergency" condition is in effect. Home and office phone numbers of parties to be notified are listed in paragraphs D4.1 and D4.3.

D6.2 Back-up.

Radio communications are available between the District Office and the dam site. Radios at each office will be attended on a 24-hour basis, whenever telephone service is disrupted while a "Flood Warning" or "Emergency" condition is in effect. The radio communication facilities are listed in Paragraph B7.2, Appendix B, of the Flood Emergency Plan. A 40-channel citizen band station is available in the District Office as additional back-up equipment. Radio communications are also available between the NYS Emergency Management Office and the Livingston and Monroe County coordinators. Radio frequencies used by the State and Corps systems are not compatible.

D6.3 Emergency.

During a situation when both radio and telephone communciations are disrupted, other Corps offices, the State Police, or any other agency equipped with radio or telephone facilities will be called upon for assistance.

D7. TIMING OF NOTIFICATIONS

All District and Division Corps personnel in paragraph D4.1 and agencies in paragraph D4.3 will be notified as soon as possible after a declaration of a "Flood Warning" or "Emergency" condition. Unless immediate notification is essential, public announcements by the Corps should not precede local notification bulletins. This will allow the local government time to get their evacu-ation actions in order.

D8. CONTENT OF NOTIFICATION MESSAGES

D8.1 Corps of Engineers.

Report to higher authority should include the following information:

a. Description of Situation.

(1) Nature and severity of problem.

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

(3) Current and forecasted weather conditions.

b. Action Planned or Underway.

(1) Type of corrective actions.

(2) Estimated time to complete corrective actions.

(3) Outlook for success.

(4) Assistance required or being furnished.

(5) Potential complications.

(6) Recommended evacuation.

c. Other.

(1) Staff at dam site.

(2) Visitors at project.

(3) Road conditions.

D8.2 Other Parties.

a. State and Local Officials.

Parties listed in paragraph D4.3 will be provided all information necessary for them to adequately execute their evacuation plans.

b. Public.

Public announcements will be limited to information pertaining to the current situation and the actions of the Corps of Engineers. The public should be referred to the local government for advice concerning evacuation.

D9. ADDITIONAL ACTIONS

D9.1 Emergency Operations Center.

The EOC will be immediately activated upon the declaration of a "Flood Warning" or "Emergency" condition. Hours of operation will be as necessary for the current situation. Representatives from the Public Affairs Office, Engineering Division, and Construction-Operations Division will be assigned to the EOC.

D9.2 Technical Liaisons.

Immediately following a declaration, a District representative, technically qualified, will be stationed at each county Office of Disaster Preparedness to provide local officials with technical advice and liaison with the District Office.

D10. EXAMPLE MESSAGES

Preparation of warning messages or announcements should begin as soon as their potential need is apparent, so that they can be issued promptly upon the declaration of an "emergency condition." Where time is available for its preparation, the initial message or announcement should contain all pertinent information. However, in some cases, an "emergency condition" may be declared with little or no advance notice. An immediate announcement will be made and additional details provided in subsequent announcements. Examples of announcements are as follows:

D10.1 Slowly Developing Conditions.

The Buffalo District of the Army Corps of Engineers announced today that a structural defect has been detected at the Mt. Morris Dam. There is no immediate danger of flooding, since there is presently no pool of water behind the dam. However, as a precautionary measure, until the dam is repaired, incoming water will not be stored, but rather passed through the dam. If heavy rains occur, flooding is possible in low-lying areas. Residents should follow instructions provided by local officials. Additional information will be released as soon as possible.

D10.2 Rapidly Developing Conditions.

The Buffalo District of the U.S. Army Corps of Engineers announced today that a structural defect has been detected at the Mt. Morris Dam. The pool behind the dam must be lowered as quickly as possible. These large releases of water will cause flooding at downstream communities. Evacuation will be directed by local officials. Additional information will be released as promptly as possible.

D10.3 Major Failure.

The Buffalo District of the U.S. Army Corps of Engineers announced today that the Mt. Morris Dam has failed. A large flood wave is moving downstream at a high rate of speed. Residents in communities along the river should immediately move to high ground and follow the instructions of local officials.

MEMORANDUM OF UNDERSTANDING
BETWEEN
CORPS OF ENGINEERS, BUFFALO DISTRICT
AND
NATIONAL WEATHER SERVICE

TO BE PUBLISHED

END

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