

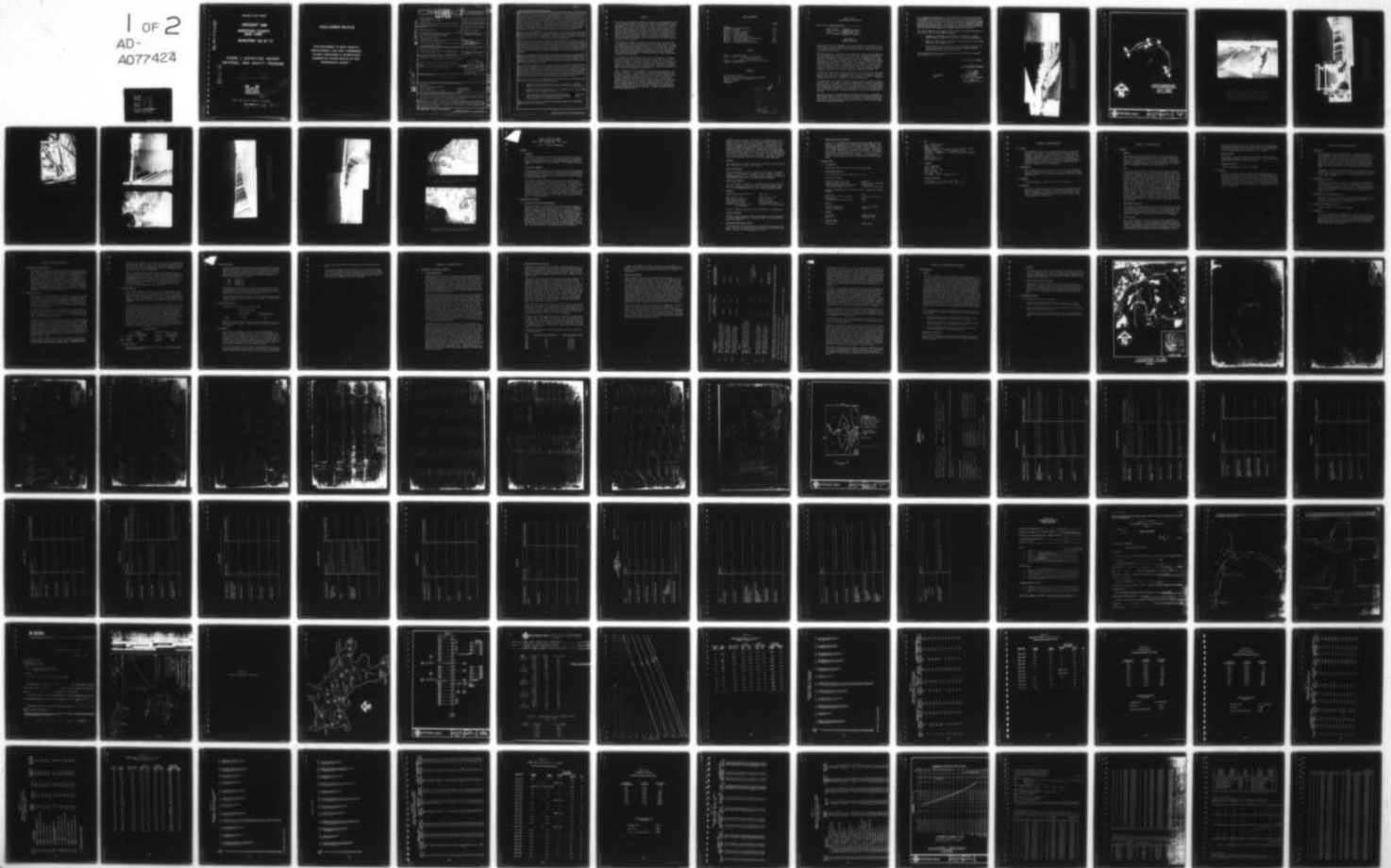
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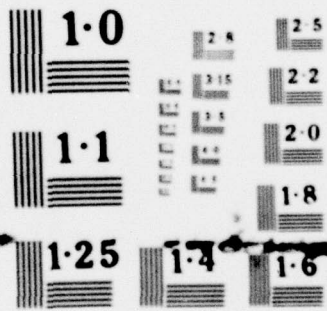
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NATIONAL DAM SAFETY PROGRAM. CRESCENT DAM (INVENTORY NUMBER NY --ETC(U)
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MOHAWK RIVER BASIN

CRESCENT DAM

SARATOGA COUNTY
NEW YORK

INVENTORY N2 NY 171

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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SEPTEMBER 1979

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Crescent Dam
Mohawk River Basin, Saratoga County, New York
Inventory No. NY 171

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Crescent Dam
Saratoga County
Troy

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional studies should be undertaken to further evaluate conditions affecting the dam.

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Additional hydrologic investigations are required to more accurately determine the site specific characteristics of the watershed. Computations prepared according to the Corps of Engineers' screening criteria establish the spillway capacity at 160,000 cfs. This capacity is 28% of the Probable Maximum Flood and 56% of the 1/2 Probable Maximum Flood. The PMF and 1/2 PMF are 571,000 cfs and 285,000 cfs respectively. The spillway is inadequate to pass the 1/2 PMF without overtopping the dam. The westerly section, Dam B, is unstable under all of the loading conditions prescribed by the Corps of Engineers' screening criteria. Therefore, the spillway structure is determined to be seriously inadequate according to the Corps of Engineers' screening criteria.

Although a dam break analysis was not performed on this run-of-river structure, the dam break flood wave is adjudged to have a significant impact on the residential structures 1/2 mile downstream. The spillway is, therefore, seriously inadequate and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

Additional structural investigations involving borings should be undertaken to determine the affect of uplift pressure on the base of the dam and provide further analysis of the structural stability of the dam. It shall evaluate the reduction of the concrete section due to erosion and the affect of this reduction on the stability of the dam.

It is, therefore recommended that within 3 months of the date of notification of the Owner, the above-mentioned structural stability investigations of the structure should be initiated to determine the appropriate mitigating measures to be taken. Within 2 years of the date of notification, appropriate remedial measures should be completed. In the interim, a detailed emergency operation plan and warning system should be developed and around-the-clock surveillance should be provided during periods of unusually heavy precipitation.

The visual inspection and screening analysis revealed additional deficiencies which require the following remedial measures:

1. Complete the aforementioned structural investigation. Perform remedial measures based on the structural stability investigation.
2. Repair the deteriorated concrete at the abutment walls, the spillway construction and expansion joints.
3. Paint and repair the tainter gates and tainter gate structure. Repair the gates and/or concrete to eliminate leakage and the tainter gate while in the closed position.

These items should also be investigated and needed remedial work completed within 2 years of notification.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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- Figure 11 - Sluice Gates - Cohoes Power & Light Corp.
- Figure 12 - Geological Map

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- Previous Inspection Report/Relevant Correspondence
- Hydrologic and Hydraulic Computations
- Stability Analysis
- References

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam Crescent Dam, NY171

State Located New York
County Located Saratoga and Albany
Stream Mohawk River
Date of Inspection August 1, 23, 1979

ASSESSMENT OF
GENERAL CONDITIONS

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional studies should be undertaken to further evaluate conditions affecting the dam.

Additional hydrologic investigations are required to more accurately determine the site specific characteristics of the watershed. Computations prepared according to the Corps of Engineers' screening criteria establish the spillway capacity at 160,000 cfs. This capacity is 28% of the Probable Maximum Flood and 56% of the 1/2 Probable Maximum Flood. The PMF and 1/2 PMF are 571,000 cfs and 285,000 cfs respectively. The spillway is inadequate to pass the 1/2 PMF without overtopping the dam. The westerly section, Dam B, is unstable under all of the loading conditions prescribed by the Corps of Engineers' screening criteria. Therefore, the spillway structure is determined to be seriously inadequate according to the Corps of Engineers' screening criteria.

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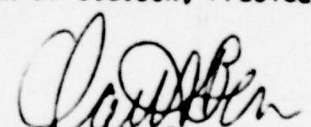
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2. Repair the deteriorated concrete at the abutment walls, the spillway construction and expansion joints.
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These items should also be investigated and needed remedial work completed within 2 years of notification.

Dale Engineering Company


John B. Stetson, President

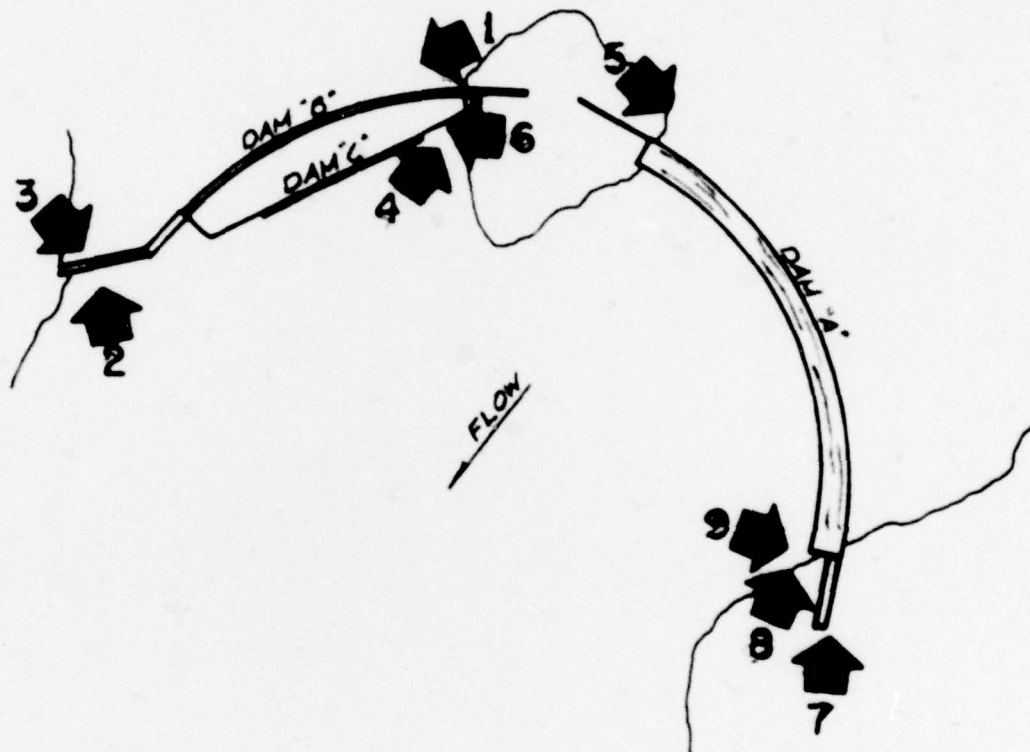
Approved By:
Date:


Col. Clark H. Benn
New York District Engineer

28 Sept 79



Overview of Crescent Dam from western end of dam and tainter gate structure. Dam composed out two overflow sections divided by island in middle of Mohawk River. The west dam section has older dam structure immediately below it.



PHOTOGRAPHIC
KEY MAP



STETSON · DALE

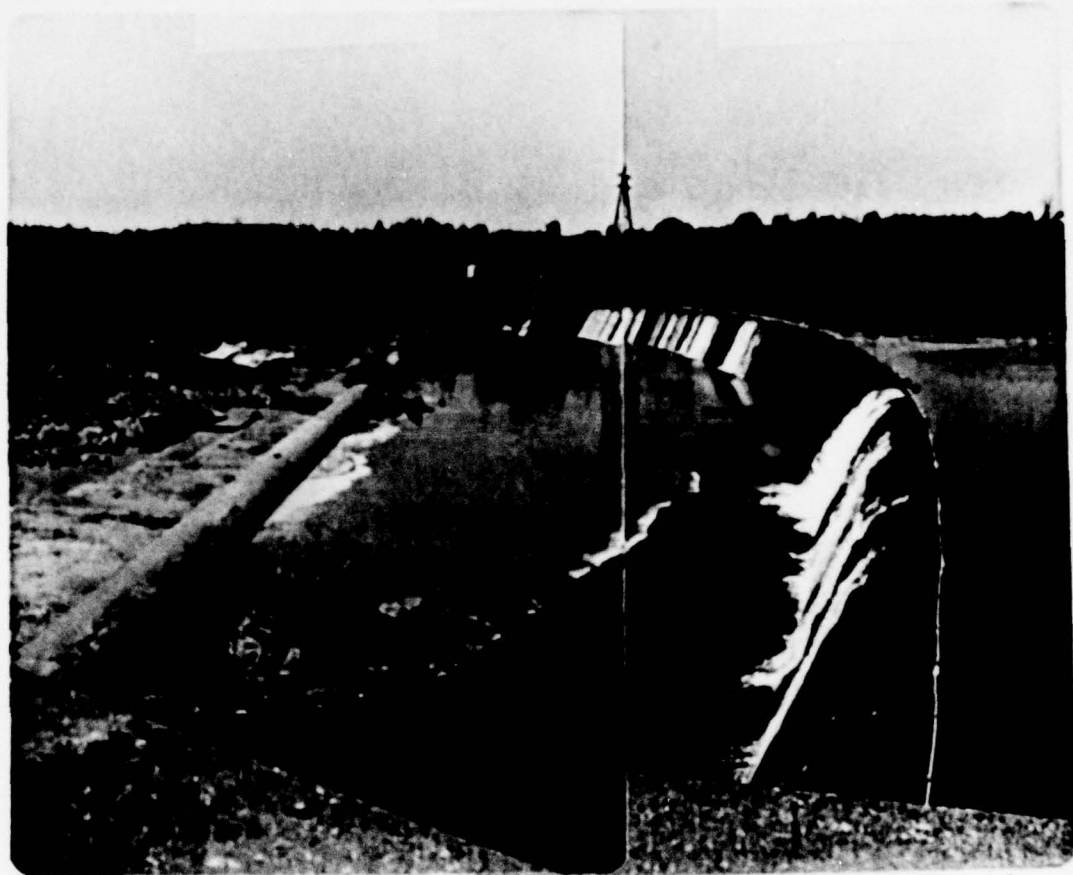
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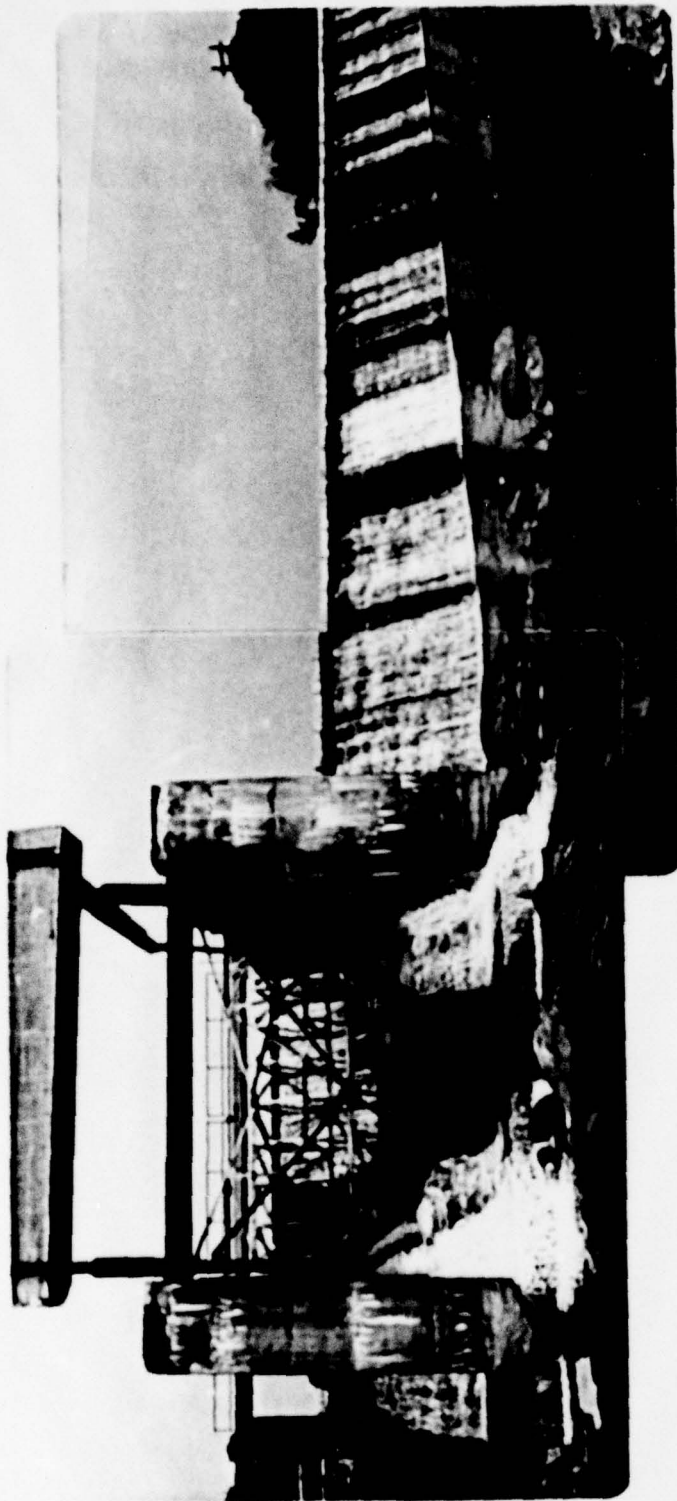
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APP'S

CRESCENT
DAM
iv



1. View of west dam section looking towards west shore. Flow over dam is coming under flashboards. Notice severe spillway surface erosion. Flow at point 1/4 across dam is coming under flashboards at section where crest surface has eroded. Immediately beyond this point, flow can be seen through monolith construction joint.



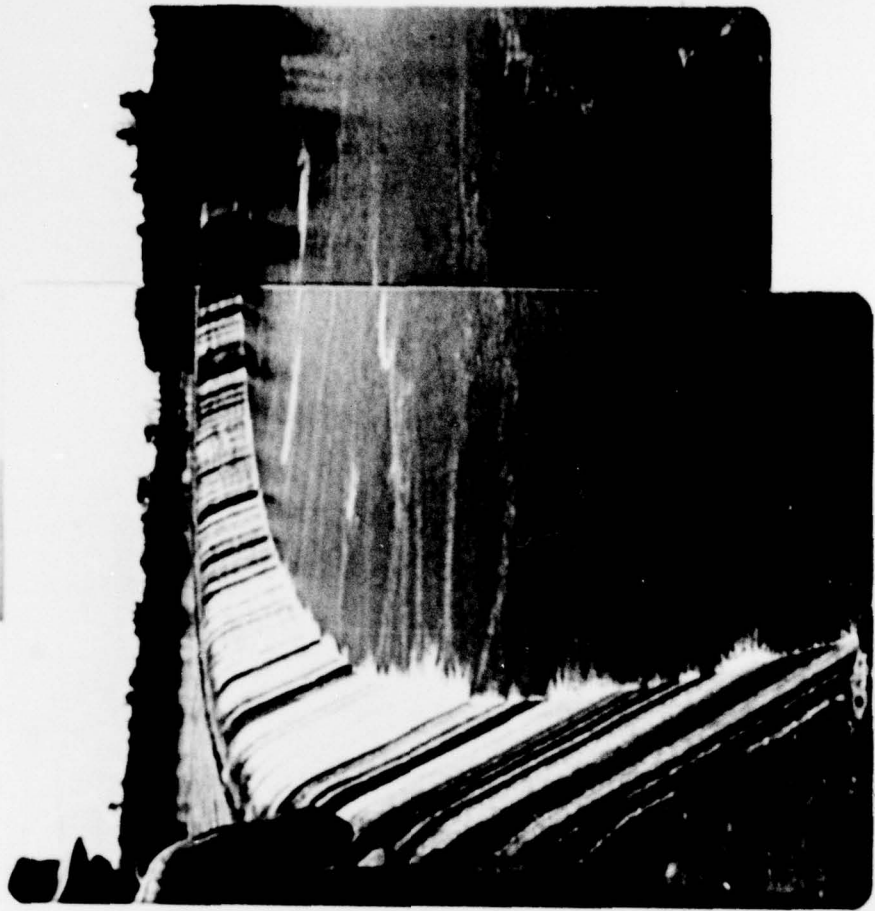
2. Close-up of west dam's west abutment on extreme left, water passage, tainter gate, and spillway with flashboards. Notice significant leakage around sides of gate and the severely eroded spillway surface with 12 inches of erosion along the top most construction joint.



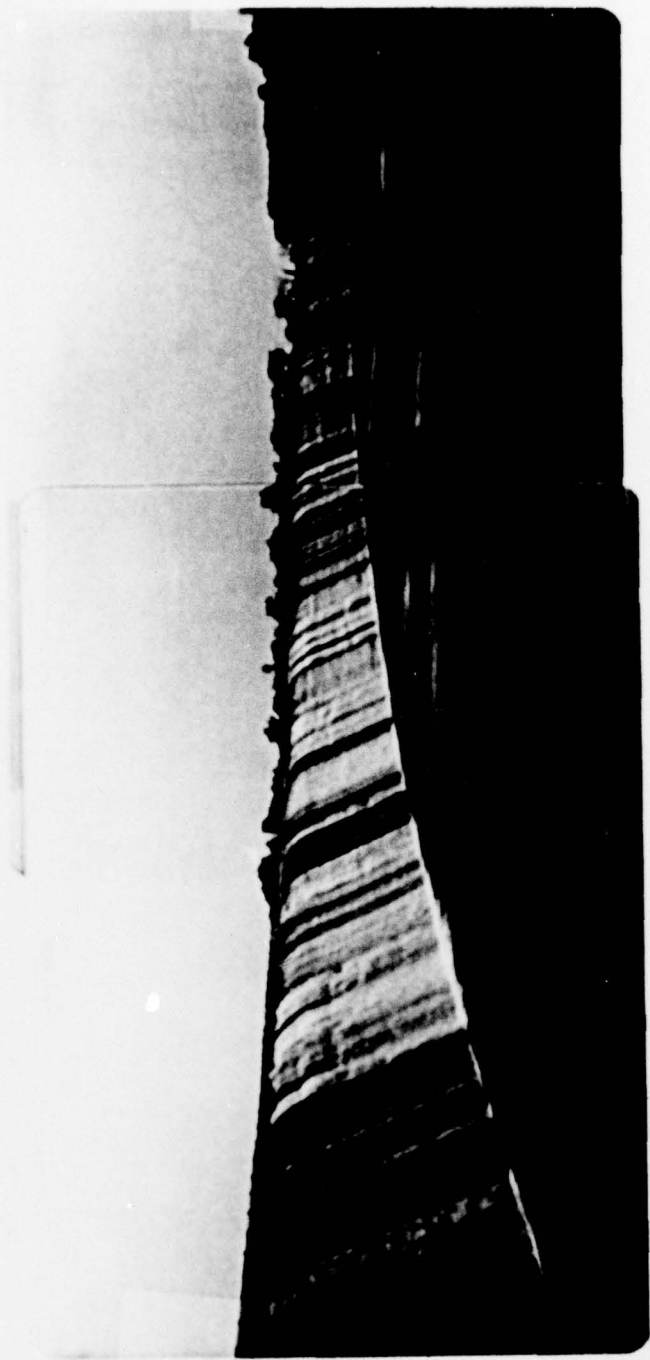
3. Close-up of tainter gate steel work showing corrosion of steel members and plate.



4. Close-up of west dam's east abutment.



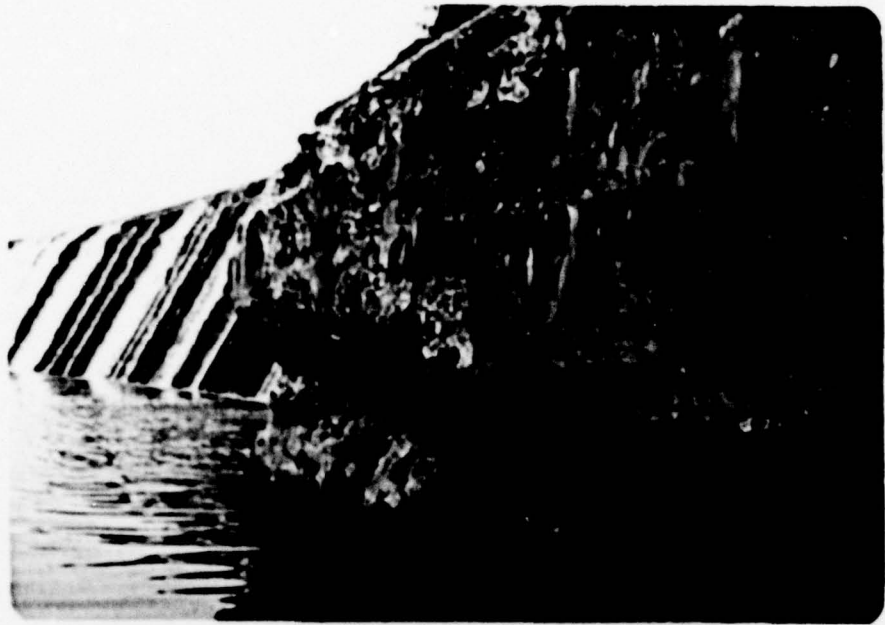
5. View of east dam looking towards east abutment. Pool of the School Street Dam, one mile downstream, comes up to base of spillway.



6. Close-up of spillway surface of east dam section taken from east abutment. Note steel bars exposed in foreground and extent of surface erosion in center portion of picture.



7. View from east abutment of north dam section looking towards island in the center of the river.



8. Close-up of wall below spillway of east dam showing deterioration at waterline.



9. Close-up of deterioration at end of wall and erosion behind walls. The rock surface is very moist.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM - CRESCENT DAM ID# - NY 171

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Authority for this report is provided by the National Dam Inspection Act, Public Law 92-367 of 1972. It has been prepared in accordance with a contract for professional services between Dale Engineering Company and The New York State Department of Environmental Conservation.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the existing condition of the Crescent Dam and appurtenant structures, owned by the New York State Department of Transportation, and to determine if the dam constitutes a hazard to human life or property and to transmit findings to the State of New York.

This Phase I inspection report does not relieve an Owner or Operator of a dam of the legal duties, obligations or liabilities associated with the ownership or operation of the dam. In addition, due to the limited scope of services for these Phase I investigations, the investigators had to rely upon the data furnished to them. Therefore, this investigation is limited to visual inspection, review of data prepared by others, and simplified hydrologic, hydraulic and structural stability evaluations where appropriate. The investigators do not assume responsibility for defects or deficiencies in the dam or in the data provided.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Crescent Dam is a concrete gravity spillway structure which is composed of two main sections which meet at an island in the Mohawk River. An electric power generating station is located on the west bank of the Mohawk River. The forebay to the generating station consists of 10 sluice gate openings which are constructed to accept stop planks. The easterly end of the forebay structure terminates in a small island. Just east of the small island is located a small stop plank structure and a tainter gate. The tainter gate forms the west abutment of one of the main sections of the dam structure. The maximum height of this section of the dam is approximately 20 feet. The stop log structure is 8 feet wide and the tainter gate is 30 feet wide. The east abutment of the westerly section of the dam is



located on a small island in the center of the Mohawk River. The easterly bank of this small island forms the westerly abutment of the easterly section of the dam which stretches across the major river channel to the east bank of the Mohawk River. The easterly section of the dam reaches a maximum height of approximately 36 feet. The Barge Canal enters the Mohawk River channel just upstream from the easterly abutment of Crescent Dam. The combination of power generating station, control structures, the two sections of the dam span the entire width of the Mohawk River in this area. This dam is the first in a series of dams that are used to regulate flow within the Mohawk River for navigational purposes and for use in power generation.

b. Location

The Crescent Dam is located in the Town of Waterford, Saratoga County and in the Town of Colonie, Albany County.

c. Size Classification

The maximum height of the dam is approximately 45 feet. The storage volume in the impoundment is somewhat less than 50,000 acre feet. Therefore, the dam is in the Intermediate Size Category as defined by The Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The Crescent Dam is located just upstream from the Cities of Cohoes and Troy. Therefore, the dam is in the High Hazard Category as defined by The Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

Waterway Maintenance Subdivision:	Region One:
New York State - DOT	New York State - DOT
Main Office - State Campus	Region 1 Office
1220 Washington Avenue	84 Holland Avenue
Albany, New York 12232	Albany, New York 12208
Director - Mr. Joseph Stellato	Engineer - Mr. John Hulchanski
(518) 457-4420	

The dam is owned by the New York State Department of Transportation.

f. Purpose of the Dam

The dam is used to regulate flows in the Mohawk River for navigational use and power generation. The Mohawk River is also used for recreational purposes.

g. Design and Construction History

Limited data was available regarding the design and construction history. Plans for the construction of the dam and lock are dated 1907. Records indicate the dam was completed in 1912.

h. Normal Operational Procedures

The facility is operated by the New York State Department of Transportation in cooperation with Niagara Mohawk Power Corporation who operates the power generating station under a lease agreement with the Department of Transportation. The main function of the facility is to provide adequate pool elevations for navigation in the Barge Canal system. The secondary function of the facility is for power generation at the power generating station. In order to fulfill the primary function of the facility, navigation, it is necessary to maintain the upstream water level at the elevation of the spillway crest.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area of Crescent Dam is 3455 square miles.

b. Discharge at Dam Site

No discharge records are available for this site.

Computed discharges:

Ungated spillway, top of dam	160,000 cfs
Ungated spillway, design flood	100,000 cfs est. from plans
Gated drawdown, tainter gate capacity through hydropower facility	Not calculated 4,343 cfs at normal pool

c. Elevation (Elevations are in Barge Canal Datum. Barge Canal = USGS + 0.99 ft.)

Top of dam	193.0
Maximum pool - Design discharge	191.0 est. from plans
Spillway crest	184.0
Stream bed at centerline of dam	148.0 ₊

d. Reservoir

Length of maximum pool	53,500 ft (1/2 PMF)
Length of normal pool	53,500 ft

e. Storage

Top of dam	67,900 acre feet
Normal pool	49,900 acre feet

f. Reservoir Area

Spillway pool	1996.3 ₊ acre
---------------	--------------------------

g. Dam

Type - Concrete, gravity.

Length - 2001+ feet

Height - 45 feet

Freeboard between normal reservoir and top of dam - 9 feet

Top width - Spillway - 11.5 ft., Abutment - 18 ft.

Side slopes - Downstream - 2 vertical/1 horizontal, Upstream - vertical

Zoning - N/A

Impervious core - N/A

Grout curtain - N/A

h. Spillway

Type - Ogee crest

Length - 1436.2 ft.

Crest elevation - 184.0

Gates - Ungated

U/S channel - Natural

D/S channel - 1 ft. to elevation 185.0

i. Regulating Outlets

Tainter gate - 30 ft. wide, 16 ft. high

Stop plank structure - 8 ft. wide, 10 ft. high

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

The information available for the evaluation of this dam has been included in this report. The information consisting of contract drawings is contained in Figures 2 through 11. Limited hydrologic information regarding the design of this dam was available. This is included in the text of Section 5.5, page 11. The drawings show cross-sections and dimensions of the various structural elements of the dam but do not include information on the properties of the foundation material nor stability analysis.

2.2 CONSTRUCTION

Details regarding the construction of this facility are included in Figures 2 through 11 in this report. The last available dam inspection report by the State of New York Conservation Commission is dated June 12, 1916.

2.3 OPERATION

No Operating Manual is known to exist for this structure.

2.4 EVALUATION

The plans for the construction of the facility agree with the visual observations made in the field. The information included in this report is adequate to complete this Phase I investigation. Therefore, no additional research for data is required in order to complete this Phase I investigation.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The Crescent Dam was inspected on August 1, 1979 and on August 23, 1979. The Dale Engineering Company Inspection Team was accompanied on the first inspection by Walter Elliot of the New York State Department of Transportation. On the second inspection, the inspection team was accompanied by Robert McCarty of the New York State Department of Environmental Conservation Dam Safety Section.

b. Dam

At the time of the inspection, the water level on the upstream side of the dam was below the top of the flashboards, however, leakage between the flashboards and the crest of the dam was of such a volume as to partially obscure the concrete surfaces of the spillway. The southerly section of the Crescent Dam is rather severely deteriorated at both horizontal joints along the spillway surface and at the vertical joints between monoliths. The center portion of the dam appears to be less severely deteriorated than the areas near the abutments. The north section of the dam is also deteriorated along horizontal joints, although this deterioration is at somewhat of a lesser degree than the south section. No through-the-dam seepage was detected during the inspection because of the water flowing over the face of the dam. There is some deterioration of the concrete walls at each abutment. The most severe deterioration was found at the north abutment of the North Crescent. The concrete at this north abutment was deteriorated to a depth 1-1/2 to 2 feet in the area at the lower pool elevation. Some erosion behind this abutment wall has also occurred.

c. Appurtenant Structures

The forebay of the generating station on the south bank of the river is controlled by a stop plank structure. At the time of the inspection, there were no stop planks on the site and the Department of Transportation representative indicates that stop planks have never been used to dewater this forebay to the best of his knowledge.

d. Control Outlet

The tainter gate which controls discharge from the impoundment is electrically operated. The gate structure is definitely in need of maintenance, although no significant deterioration of the steel was noted. Leakage occurs around the sides of the gates. The stop plank structure also controls the outlet from the impoundment. The stop plank structure was in operating condition and some of the stop

planks were in place at the time of the inspection. The concrete surfaces around the tainter gate and the stop plank have been recently repaired, although significant deterioration in the tainter gate wall at the downstream water elevation is still evident.

e. Reservoir Area

The reservoir consists of approximately 10 miles of river channel which extends upstream to the Vischer Ferry Dam. There are no known areas of bank instability along this course.

f. Downstream Channel

The downstream channel is formed in bedrock.

3.2 EVALUATION

The visual inspection revealed generally deteriorated concrete surfaces on the spillway structure and at the spillway abutments near the downstream waterline. No major deformation of the alignment of any of the structures was noted in the visual inspection. The tainter gates and stop log structure are in operating condition, although maintenance is required on the tainter gate. The gates controlling flow into the forebay of the power generating station are not in operating condition.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

The primary function of this facility is to control water levels in the impoundment upstream from the dam for navigational purposes in the Barge Canal. Operation procedures are directed toward this end. The tainter gate at the Crescent Dam is operated to control this water level. Flows through the power generating station are also controlled to assure that water levels in the impoundment are adequate for navigational purposes. The operation of the facility is under the control of the New York State Department of Transportation.

When water is 2.0 feet above masonry dam and the flashboards are on the dam, the tainter gate is open 9.0 feet, provided no ice is in the river. When the water recedes to 1.0 feet above masonry dam, the tainter gate is closed.

4.2 MAINTENANCE OF THE DAM

Maintenance and operation of the dam is controlled by the New York State Department of Transportation. The Department inspects the facility every two years and a report on the condition of the structure is filed at the Central Office in Albany. Maintenance of the structure is scheduled on a priority basis as a result of the bi-annual inspections.

4.3 MAINTENANCE OF OPERATING FACILITIES

The gates controlling the flow into the downstream channel are under the control of the New York State Department of Transportation. These gates are operational at the present time.

4.4 DESCRIPTION OF WARNING SYSTEMS

No warning system is in effect at present.

4.5 EVALUATION

The dam and appurtenant structures are inspected at regular intervals by the New York State Department of Transportation. Maintenance on the structure has been minimal in recent years as evidence by the deteriorated conditions of the concrete on the spillway and of the steel tainter gate. These conditions indicate that, in the past, maintenance has not been adequate.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Mohawk River Basin drains 3456 square miles above Cohoes, New York, according to the USGS stream gage which is located nearby the dam. The river flows south from its source in west-central New York until it reaches the City of Rome, from which it proceeds in a east-southeast direction to Cohoes where it joins the Hudson River. For most of its 156 miles, the Mohawk River is paralleled by the State Barge Canal. Two of the basin's three major reservoirs are used to supplement the flow in the canal. They are Delta Reservoir, on the Mohawk River itself; Hinkley Reservoir, on West Canada Creek; the third impoundment, Schoharie Reservoir, is located on Schoharie Creek in the southern most part of the study area used to supplement the water supply of the City of New York.

5.2 ANALYSIS CRITERIA

The purpose of this investigation is to evaluate the dam and spillway with respect to their flood control potential and adequacy. Where the structure is integrated with hydropower and navigation lock facilities, interrelationships from a hydrologic standpoint have been evaluated. In general, in this screening analysis, control structures and gates used for the latter two purposes are not considered as flood control devices.

Different scenarios of partial dam failures, i.e., tainter gates or monolith failures, are beyond the scope of this analysis due to the fact that the dam is a run-of-river facility and the downstream dam break flood wave analysis is multi-dimensional. The initial hazard area is one-half mile below the dam.

The dam's stability and flood discharge capacity is assessed through the evaluation of the Probable Maximum Flood (PMF) for the watershed and the subsequent routing of the flood through the dam's spillway system. The PMF event is that hypothetical flow induced by the most critical combination of precipitation, minimum infiltration loss and concentration run-off of a specific location that is considered reasonably possible for a particular drainage area. Since this dam is in the Intermediate Dam Category and is a High Hazard, the guidelines criteria (Ref. 1) require that the dam be capable of passing the Probable Maximum Flood.

An HEC-1 computer model for the basin was published by the New York District Corps of Engineers in a report entitled Hydrologic Flood Routing Models, Upper Hudson and Mohawk Rivers, dated October, 1976.

The report was reviewed for the purpose of this investigation and the model which was used for preparation of the report was obtained from the New York District. The model was recoded and executed for analysis of the PMF. No changes were made to the unit hydrograph, base flow, loss rate or routing parameters.

The U.S. Army Corps of Engineers' Hydrologic Engineering Center's Computer Program HEC-1 DB was utilized to evaluate the PMF hydrology. The Probable Maximum Precipitation (PMP) was 21.9 inches according to Hydrometeorological Report (HMR #51) for a 24-hour duration, 200 square mile basin. Loss rates used were those applied in the Transferred Agnes Storm and SPF Analysis in the modeling report. One multi-plan analysis (.2, .4, .5, .6, .8, 1.0 PMP) was performed. Rainfall was distributed evenly over the basin.

5.3 SPILLWAY CAPACITY

The spillway system is composed of two crest shaped spillway sections. Dam A is 900 feet in length and Dam B is 506 feet in length, with an estimated design head of 7 feet for both dams. Discharge coefficients were computed between 3.3 and 4.15. Submergence was not checked. The pool of the School Street power dam, less than a mile downstream, comes up to the toe of Dam A but not Dam B which is less in height.

At the top of dam elevation, the overflow spillway capacity was computed at 160,000 cfs. Two sources of information were used to assess flood magnitudes on the Mohawk in the vicinity of the dam. The aforementioned computer model and the USGS gage at Cohoes, New York. The PMF and 1/2 PMF values computed from the computer model were 571,000 cfs and 285,000 cfs respectively. A frequency analysis of the gage at Cohoes which was obtained from the New York District of the Corps of Engineers indicates that the 500 year flood has a peak of 198,000 cfs. Plotting and extending the frequency analysis results suggests that the PMF and 1/2 PMF may be 300,000 cfs and 225,000 cfs. No adjustment in the gage results for the drainage area was made to assess the flow conditions at Vischer Ferry, since the difference in the drainage area is not significant.

SPILLWAY CAPACITY

	HEC-1 DB Model		Frequency Analysis of Gage	
	Discharge	Capacity as % of Discharge	Discharge	Capacity as % of Discharge
PMF	571,000	28%	300,000	53%
1/2 PMF	285,000	56%	225,000	71%

5.4 RESERVOIR CAPACITY

The reservoir storage capacity at top of dam is estimated at approximately 49,900 acre feet.

5.5 FLOODS OF RECORD

Floods have been measured at USGS gaging station 01357500 at Cohoes, New York since 1918. No events have been recorded which are greater than the top of dam spillway capacity. Four floods have occurred equal or greater in magnitude than the high water elevation of 191 feet shown on Contract No. 14 Plans. That elevation equates to a design flood capacity of 100,000 cfs.

1964	143,000 cfs
1936	130,000 cfs
1938	102,000 cfs
1956	100,000 cfs

The Department of Transportation, Mohawk River Canal design computations show a design flood of 95,000 cfs, these computations were dated October 3, 1913. They also show top of dam capacity at 154,000 and design flood elevation discharge 105,000 cfs.

Flood waters were observed over the Crescent powerhouse forebay walls in March, 1968. That flood elevation corresponds to 7 feet over the crest of the dam.

5.6 OVERTOPPING ANALYSIS

Overtopping of the dam would occur as follows:

	<u>OVERTOPPING IN FEET</u>	
	<u>HEC-DB Model</u>	<u>Frequency Analysis</u>
PMF	10.5	4.5
1/2 PMF	4.0	2.0

According to this analysis, the dam would be overtopped by the 1/2 PMF using either procedure to developing the hydrologic and hydraulic information.

5.7 EVALUATION

The spillway is inadequate to pass the 1/2 Probable Maximum Flood without overtopping the dam. Based on the Corps of Engineers' criteria, the dam is considered to have a seriously inadequate spillway since the stability computations performed in Section 6 have indicated that a portion of the dam, Dam Section B, is unstable under the 1/2 PMF event. The hydrologic analysis performed in this report indicates that the dam would be overtopped by a flood event with a return interval probability of once in every 300 years.

The river's downstream channel capacity as determined by the initial investigations suggests that at the 1/2 PMF condition, the downstream hazard, located 1/2 mile below the dam along the north shore, would

be at or near the threshold of flooding without a dam break condition.

An accurate dam break computer analysis on a run-of-river type dam such as this is beyond the scope limitations of this study. However, it is anticipated that a break in the dam such as one or more of the monoliths failing would increase the flood stage to cause a significant increase in flooding conditions downstream.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Crescent Dam consists of two separate dam structures extending across the Mohawk River. The dam is sited at a location where an island exists near mid-river. By utilizing the island as a natural barrier to flow, the actual dam facility at this location could consist of two independent structures abutting to the island. At the dam location, the river extends in an approximately north-south direction. The structure damming the river to the westerly side of the island has an approximately east-west alignment (Dam B), whereas the structure on the easterly side of the island (Dam A) has been sited with more of a north-south orientation.

Both dam sections are concrete structures having a curved alignment. Virtually the entire lengths of both dams function as spillway sections. The facility was inspected under conditions where limited spillway flow was occurring but visible/accessible downstream toe and abutment locations indicate the dam is sited on rock. Observations indicate the dam/spillway sections retain stability with no indication of structural displacement. With the spillways being topped, the physical condition of concrete in the structures was not fully visible for detailed evaluation. However, it was evident that surface deterioration of the concrete of the downstream faces has occurred: the more significant deterioration consists of spalling and erosion at the numerous construction joints in these poured concrete structures but a general spalling and erosion of the entire facing has also occurred, albeit less severe than at joint locations. Because of the spillway overflow condition, it could not be determined if through-the-dam seepage occurs.

The westerly abutment for Dam B consists of a single tainter gate structure joining a small reservoir bypass. Some, generally limited, deterioration of the concrete in this structure has occurred. The southerly/easterly abutment structure for Dam A consists of concrete which has experienced some deterioration, the most significant being an erosive undermining on the order of two feet deep of the downstream section of abutment headwall at tail water level. Some seepage at the rock face constituting the downstream exposure of this rock abutment occurs, but it is believed the flow represents gravitational ground water and not reservoir leakage (because of the near-vertical bedding planes of the rock which are parallel to the dam's longitudinal axis, reservoir leakage would have to be across the rock bedding, a very restrictive path for flow). Some erosion of soil materials has occurred in embankment areas immediately downstream of the dam but the condition does not present a danger to the dam structures at this time.

b. Geology and Seismic Stability

Crescent Dam is located within the Hudson Valley lowland which is a section of the Valley and Ridge Province. Both the dam and spillway are sited on bedrock of the Austin Glen Formation of Late Ordovician age. The formation here consists mainly of grayish, fine-to medium-grained, calcareous graywacke sandstone with some interbeds of black, fissile shale.

Structurally, the site is within a klippe, an erosional remnant of an overthrust block. Bedding is distorted with the strike variable, from nearly normal to parallel to the dam's orientation. At the westerly end of Dam B, beds strike N65E with a dip of 80° or more to the south. The joint system has two prominent sets with a spacing of two feet or less; both sets have a high angle dip of more than 80°, one set strikes N20W and the other N60W. At the easterly end of this dam, near the island, beds strike N85E and dip 65° south. Beds here are highly contorted. A small syncline is present downstream of the dam near the island, with a plunge to the southeast. Strikes vary from N10E to N30E and dips from 20° to 80°. At the southern end of Dam A the rock is mainly contorted shale, generally striking N25E, approximately parallel to the dam and at a high angle to the abutment; dip varies from 75° south to 90°.

At the abutment of the south easterly end of Dam A there is a ground water seep. Considering the orientation of the bedding relative to the dam and the relative impermeability of the shale perpendicular to the strike, the seep is most likely from ground water rather than dam or abutment leakage. However, the mined condition of the shale behind the abutment could be conducive to frost wedging.

Although faults are present in the region, there are no known faults or shear zones in the immediate vicinity of the dam site (See Geologic Map 1). The thrust block or klippe upon which the dam site is located would not be considered as being potentially active, being that it had been thrust into its present position from the east. The area is located within Zone 2 of the Seismic Probability Map but does have potential of a Zone 3.

Information on some of the larger earthquakes occurring in the area is tabulated below:

<u>Date</u>	<u>Intensity - Modified Mercalli</u>	<u>Location Relative to Dam</u>
1845	VI	21 mi S
1907	IV	14 mi W
1916	IV-V	15 mi NW
1916	V	34 mi N
1931	VII	41 mi N
1955	V	12 mi N
1958	IV	12 mi SW

A number of earthquakes of lesser intensity are known to have occurred in this region, according to the records of the New York State Geological Survey. Two of these were located about 9 miles west of the dam site.

c. Stability Evaluation

Design drawings available for review show plan alignment and cross-sections from the dam spillway but do not include information on the properties of the dam and foundation materials, nor stability analysis. As part of the present study, stability evaluation have been performed for dam spillway sections. Actual properties of the dam's construction materials and foundations were not determined as part of this study; where information on properties were necessary for computations, but lacking assumptions felt to be practical were made. The stability computations assumed a structural cross-section based on dimensions indicated by the plans included in this report. It should be considered that in areas where deterioration has occurred, section dimensions would be less than indicated by the plans, with some adverse affect on the structural strength expected. The analysis also assumed dam sections to be monoliths possessing necessary internal resistance to shear and bending occurring as a result of loading.

The results of the stability computations are summarized in the table below. The stability analysis are presented in Appendix D. The analysis for Dam A is based on a complete dam section sited on foundation rock. Drawings available for Dam B indicate it to be embedded to a significant depth into the area's foundation material; the analysis for the dam is for the section above the ground line. Both dams have a curved alignment but stability benefits gained from possible arching effects have not been considered.

RESULTS OF STABILITY COMPUTATIONS

	Loading Condition	Factor of Safety*		Location of Resultant Passing through Base***
		Overturning	Sliding**	
	<u>Dam A</u>			
(I)	Water elevations at normal operating level, uplift on base plus 7.5 kips per lineal foot ice load acting.	1.45+(1)	5.1+	0.38b(1)
(II)	Water elevations at 1/2 PMF levels, uplift acting on base as computed for normal operating conditions.	1.34+(2)	4+	0.33b(2)
(III)	Water elevations at PMF levels, uplift acting on base as computed for normal operating conditions.	1.31+(2)	3.8+	0.33b(2)
	<u>Dam B</u>			
(IV)	Water elevations at normal operating level, dam section analyzed is section above ground elevation, uplift on plane plus 7.5 kip per lineal foot ice load acting	1.17	7+	0.13b' (b' = width of dam on plane analyzed)
(V)	Water elevations at 1/2 PMF levels, uplift acting on plane as computed for normal operating conditions	1.1	4.8	0.08b'
(VI)	Water elevations at PMF levels, uplift acting on plane as computed for normal operating conditions	0.94	4	Not Applicable (outside b')

*These factors of safety indicate the ratio of moments causing overturning to those moments resisting, and the ratio of forces causing sliding to those resisting.

**As determined applying the friction-shear method.

***Indicated in terms of the dam's base dimension, b, measured from the toe of the dam.

- (1) Not considering affects of passive resistance at toe.
- (2) Includes affects of some passive resistance at toe.

The analysis indicate Dam A is stable under forces possible during normal operations including ice, and the 1/2 PMF and PMF conditions, but the Dam B section analyzed is not stable under any of these conditions according to Corps of Engineers' evaluation criteria (e.g., where the resultant of forces acting on the dam is located outside of the middle third of the base or plane analyzed, tensile stress would develop in the dam section, a condition which is structurally undesirable because of the very low design tensile strength of concrete. The analysis indicate adequate structural stability would exist for Dam B if the concrete does possess limited tensile strength (See Appendix D).

Critical to the analysis and resulting indication of stability are the items of uplift water pressures acting on the dam's base/section and relative permeabilities of the site's foundation rock or dam concrete. For the "normal operating conditions" case, the analysis uplift force was based on a full headwater hydrostatic pressure acting on the dam section's upstream edge and a hydrostatic pressure based on the tail water elevation acting on the dam section's downstream edge. Uplift was assumed to vary linearly between a section's upstream and downstream faces, and act upon 100 percent of the dam base/section. The resulting uplift force represents a condition that is significant in arriving at the indicated factors of safety.

Uplift as computed for the normal operating condition was also assigned for the flood conditions studied, it being assumed that uplift pressures would not increase significantly over a relatively short flood stage time period, because of expected low permeability through the foundation rock or dam concrete.

Further engineering studies are recommended for Dam B to fully evaluate this structure's as-built-condition and to plan measures necessary to improve the stability.

Though the computations indicate the Dam A is stable for the loading conditions studied, the analysis have been based on having a section which possesses structural integrity related to sound and undeteriorated construction materials. Field inspection observations indicate that concrete deterioration is occurring at numerous locations in the dam structure. For assurance of stability, maintenance/repair need be undertaken to rehabilitate the structural concrete comprising the spillway and abutment structures. The maintenance/repair program should include an inspection with the reservoir level slightly below spillway elevation to detect possible through-the-dam and under-dam seepage, and also an inspection with a lowered reservoir to evaluate the physical condition of the dam section's upstream face.

Maintenance inspections should extend to regularly scheduled observations of the areas downstream of dam sections where soil erosion and rock seepage has been noted, to detect significant changes which could effect the dam structures and require an action for their protection.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Safety

The Phase I inspection of the Crescent Dam on the Mohawk River did not indicate conditions which constitute an immediate hazard to human life or property. The tainter gate which controls flow from the impoundment is in need of maintenance. Although the concrete surfaces at this tainter gate have recently been repaired, the steel members of the gate structure are heavily rusted and substantial leakage occurs around the gate while in the closed position. Deterioration of the abutment wall has occurred at the level of the downstream pool. The hydrologic/hydraulic analysis indicates that the dam would be overtopped during a 1/2 PMF flood event. The stability analysis indicates that Dam B, (the westerly spillway section) is unstable under all loadings as prescribed by the Corps of Engineers' criteria, since the resultant of the forces acting on the dam is located outside the middle third of the plane analyzed. Therefore, according to the Corps of Engineers' criteria, the spillway is classified as seriously inadequate and the dam is assessed as unsafe, non-emergency. The visual inspection of the dam also disclosed substantial deterioration of the concrete spillway surfaces along both horizontal and vertical joints.

The following specific safety assessments are based on the Phase I visual examination, analysis of hydrology and hydraulics, and structural ability:

1. Concrete surfaces of the spillway sections are significantly deteriorated along both horizontal and vertical joints.
2. Concrete at the base of the abutment walls is severely deteriorated at the water level of the downstream pool.
3. The tainter gate system is heavily rusted and leakage occurs around the gate while in the closed position.

b. Adequacy of Information

The information available is adequate for this Phase I inspection report. Design and construction information is limited to the construction plans.

c. Urgency

The deterioration of the concrete surfaces has resulted in a reduction in the dam section. This could further reduce the stability of the dam. Therefore, the structural investigations recommended below should be undertaken within three months and remedial work should be completed within two years.

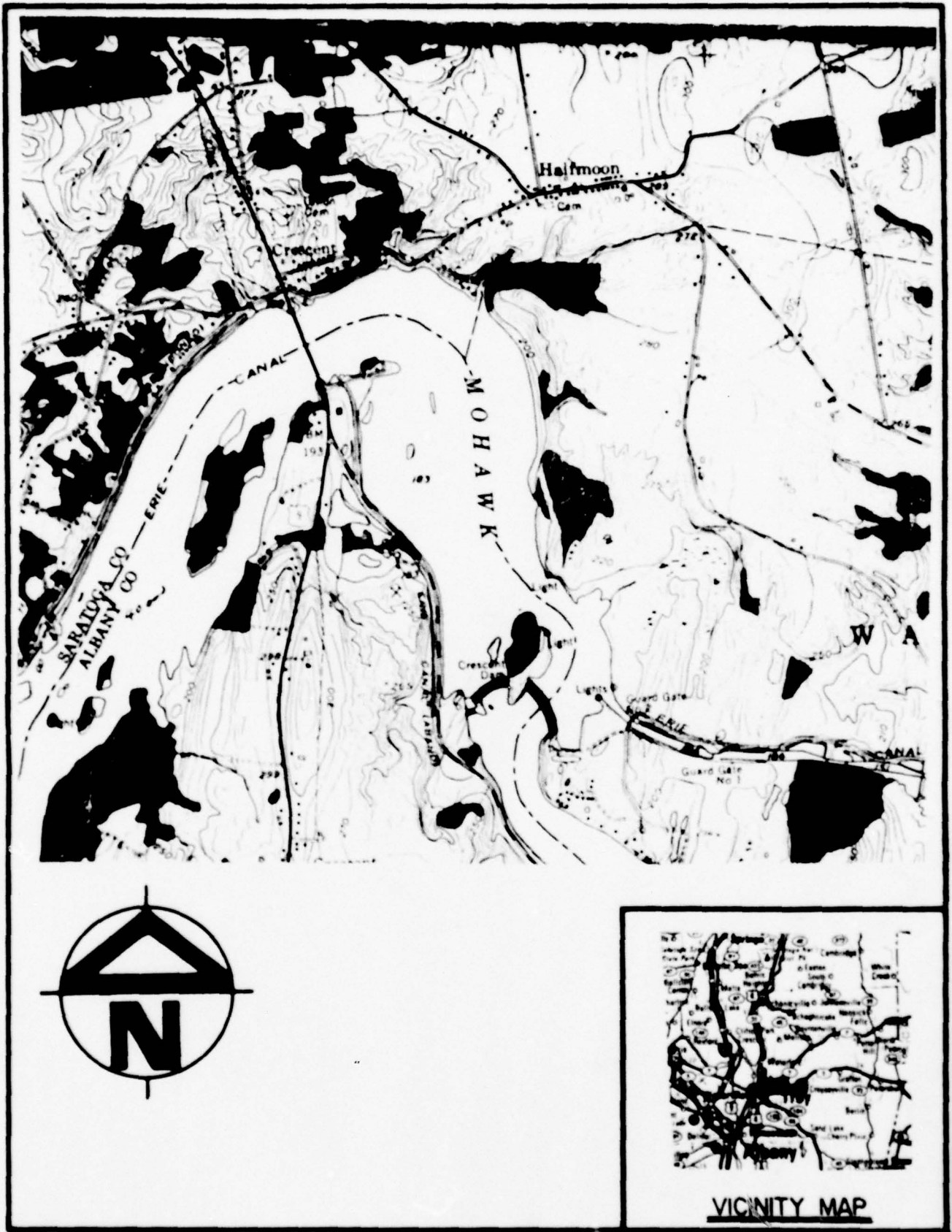
d. Need for Additional Investigation

Additional structural investigations involving borings should be undertaken to determine the affect of uplift pressure on the base of the dam. It should evaluate the reduction of the concrete section due to erosion and the affect of this reduction on the stability of the dam. This investigation should address the stability of the dam.

7.2 RECOMMENDED MEASURES

The following steps should be undertaken:

1. Complete the aforementioned structural investigation. Perform remedial measures based on the structural stability investigation.
2. Repair the deteriorated concrete at the abutment walls, the spillway construction and expansion joints.
3. Increase the level of maintenance on the tainter gate structure and eliminate leakage around the tainter gate while in the closed position.



LOCATION PLAN

FIGURE 1



FIGURE 2



Contract No. 14.

Erie Canal Sections 1 & 2

From about one and one-half miles below Creston, Mo. through Missouri River to vicinity of Hartford, Mo.

DETAILED LOCATION PLAN & PROFILE OF DAM 2, CRESCENT

Scale: 1" = 100'

Prepared by
Checked by
Approved by

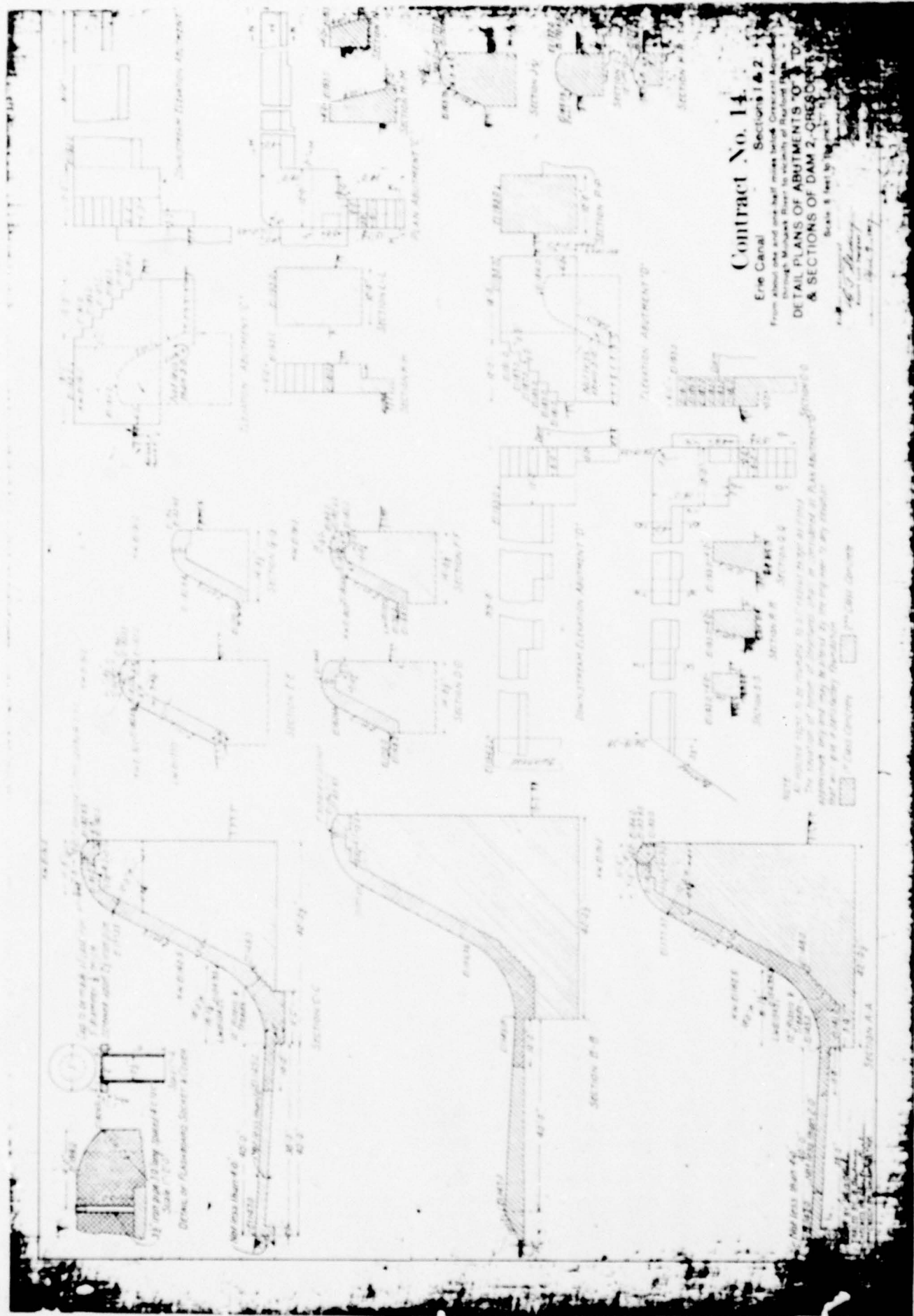
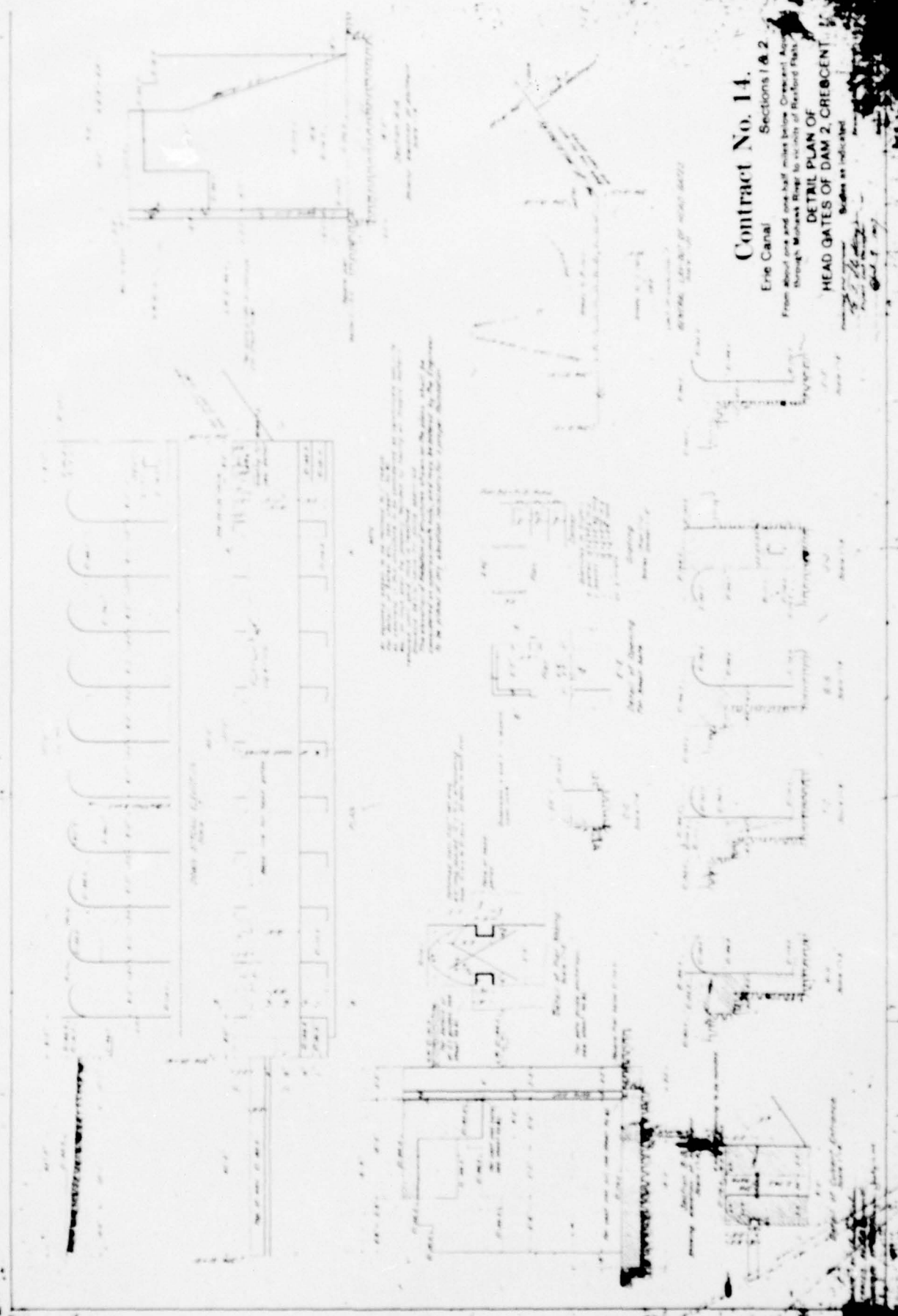


FIGURE 5



Contract No. 14.

Erie Canal Sections 1 & 2

From about one and one-half miles below Crescent No. 1 through Mulhens River to vicinity of Bedford Park

DETAIL PLAN OF HEAD GATES OF DAM 2, CRESCENT

Scales as indicated

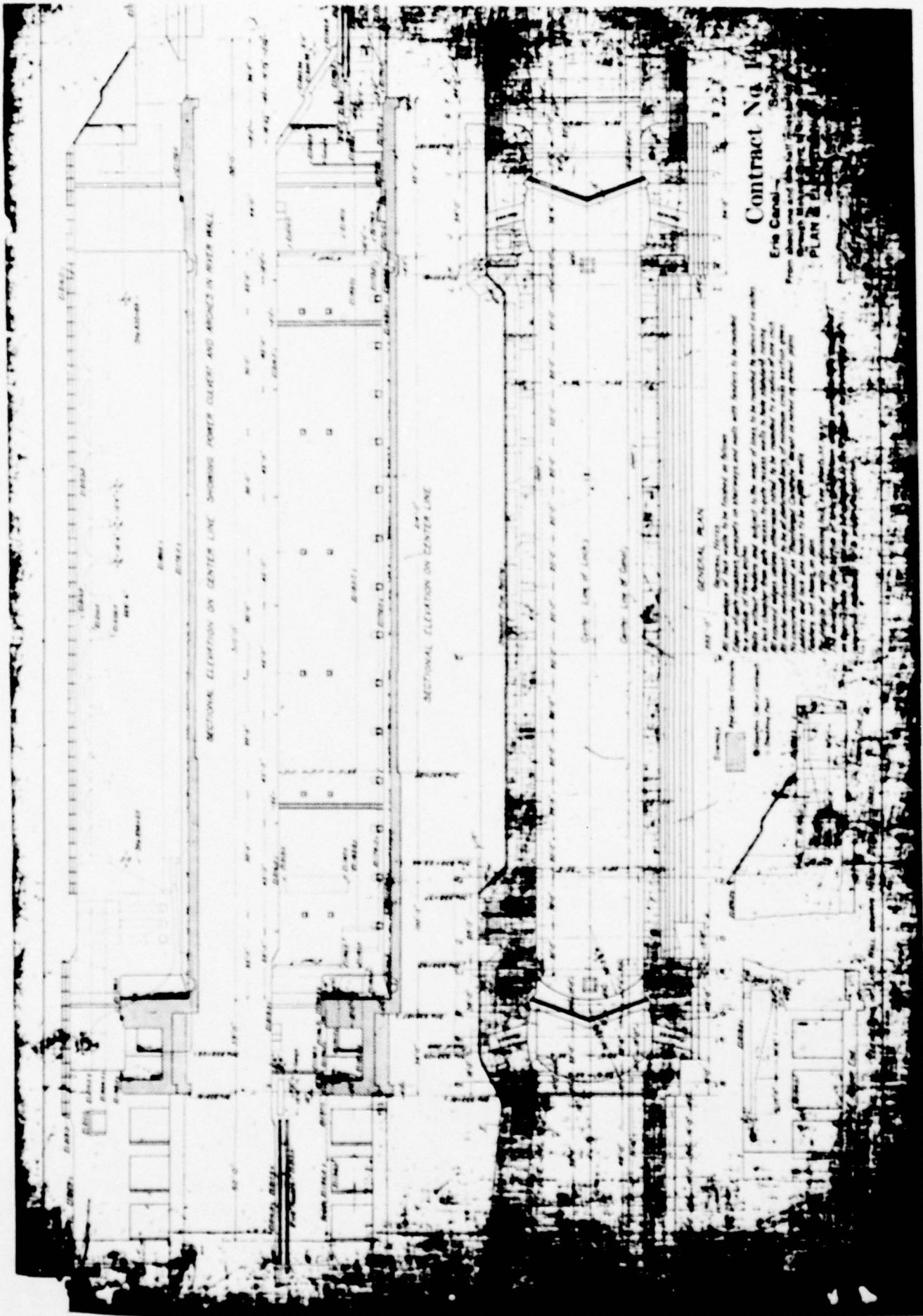
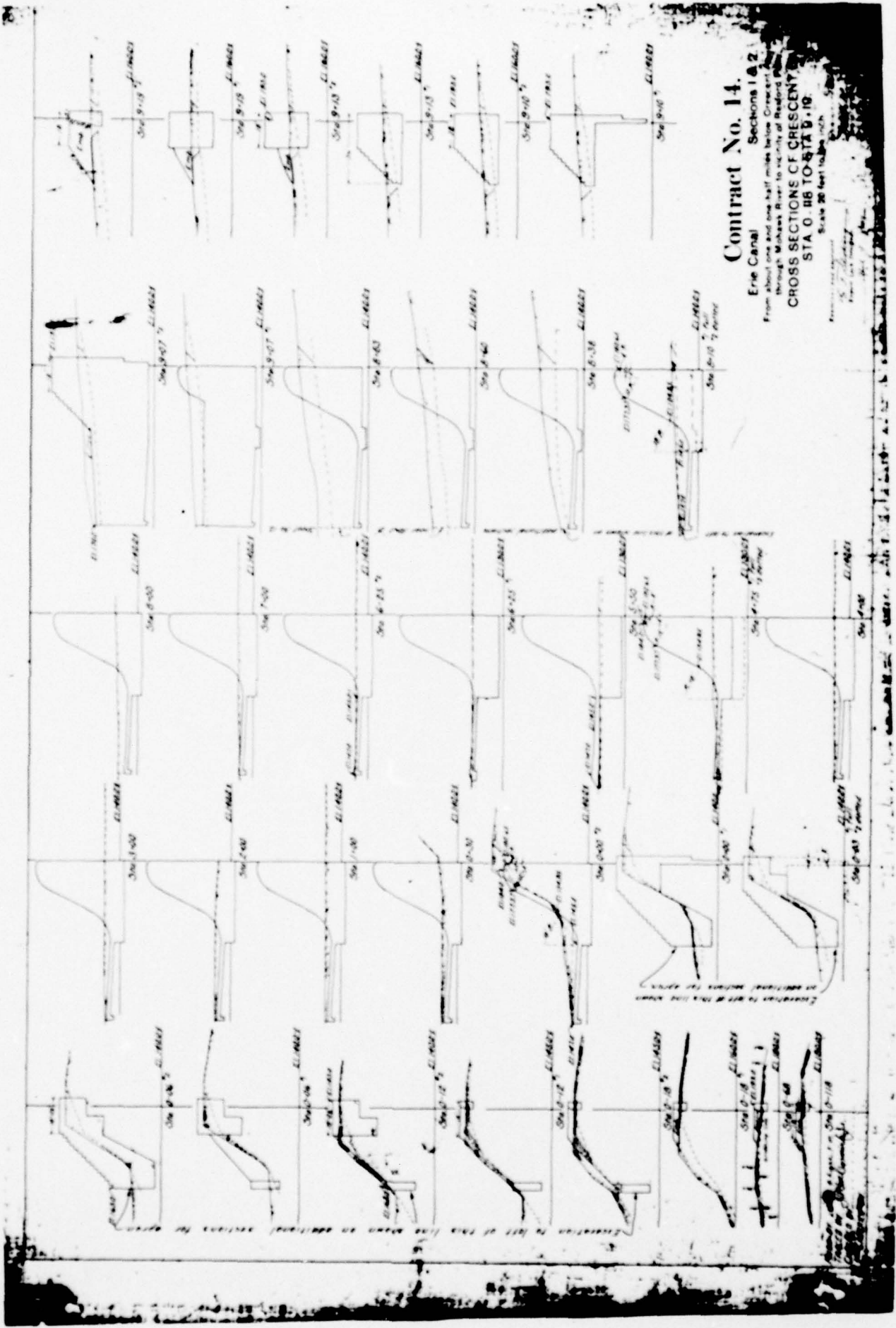


FIGURE 7



Contract No. 14.
 Erie Canal Sections 1 & 2
 From about one and one-half miles below Crescent Lake
 through Mohawk River to vicinity of Hartford High
 CROSS SECTIONS OF CRESCENT DAM
 STA 9+25 TO STA 10+78
 Scale 20 feet to the inch

FIGURE 8

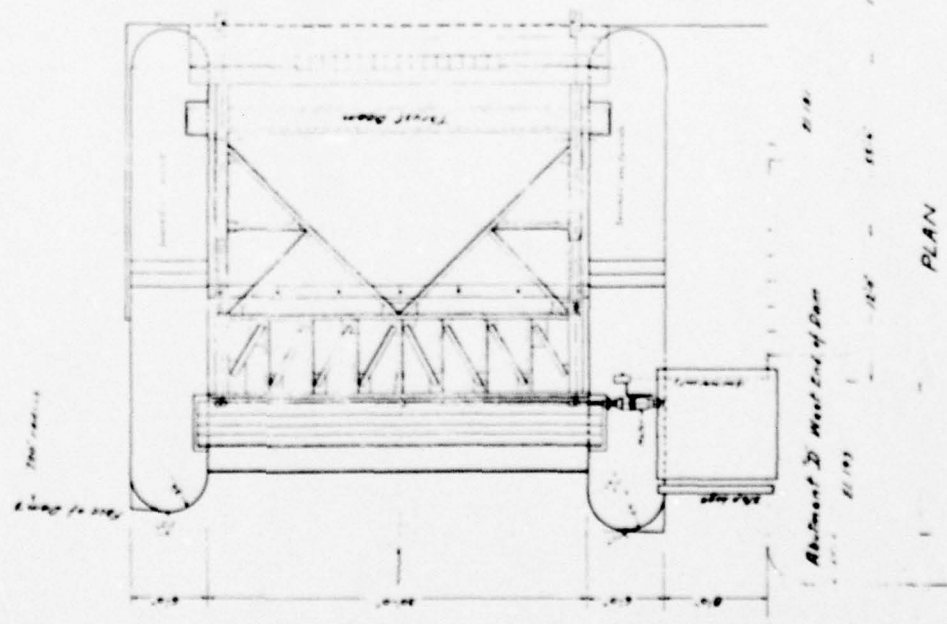
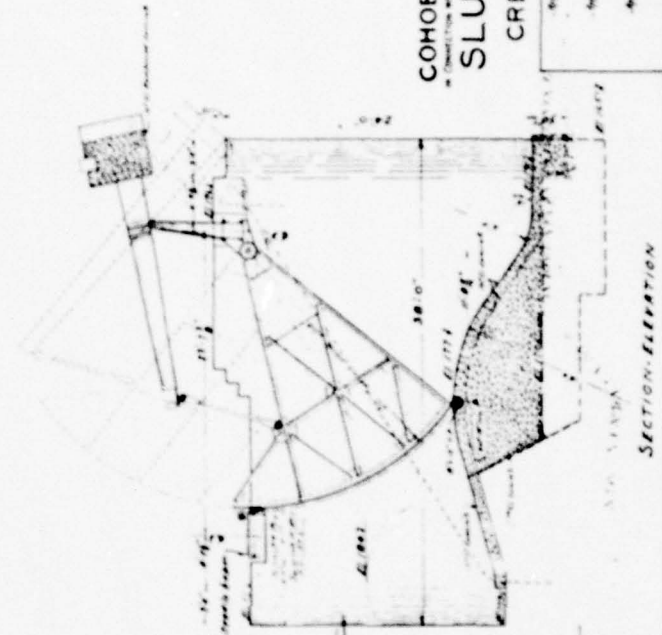


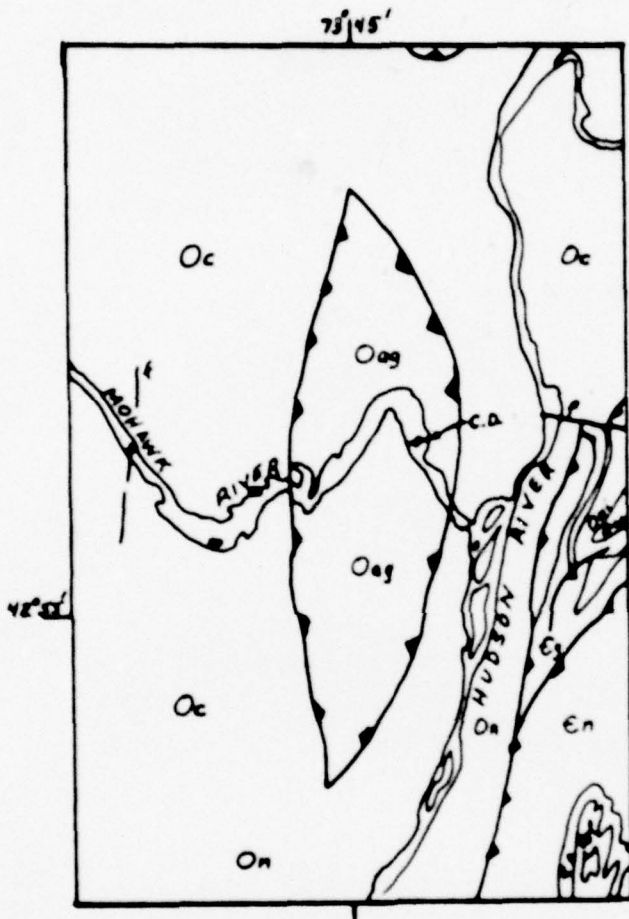
Contract No. 14.
 Erie Canal Sections 1 & 2
 From about one and one-half miles below Croton
 through Mahanet River to vicinity of Bedford
CROSS SECTIONS OF CRESCENT
STA 0+00 TO STA 0+118
 Scale 20 feet to one inch

FIGURE 10

COHOES PR & LT CORP
 CONSULTING ENGINEERS
SLUICE GATES
 CRESCENT DAM

Approved: _____
 Checked: _____
 Drawn: _____
 Date: _____





- LEGEND**
- Oc - Canajoharie shale
 - On - Normanskill shale
 - Oag - Austin Glen Formation
 - Omi - Mount Merino Formation
 - Osf - Stuyvesant Falls Fm.
 - Eg - Germantown Fm.
 - En - Nassau Formation

Thrust Plate
Teeth on overthrust block

Fault line

C.D. - Crescent Dam



STETSON • DALE

DATE
8.21.79

DRAWN
HM

JOB
2305

APP'D
FIGURE 12

GEOLOGIC
MAP

CHECK LIST
VISUAL INSPECTION

PHASE 1

Name Dam Crescent Dam County Albany/Saratoga State New York ID # NY171

Type of Dam Concrete Gravity Hazard Category High

Date(s) Inspection 1. August 1, 1979 Weather Sunny Temperature 90°
2. August 23, 1979

Pool Elevation at Time of Inspection 184.66* M.S.L. Tailwater at Time of Inspection 156.29*

* Barge Canal Datum

Inspection Personnel:

(1), (2) <u>N. F. Dunlevy</u>	<u>Dale Engineering</u>	<u>(1) J. Hulchanski N.Y.S.D.O.T.</u>
(1) <u>F. W. Byszewski</u>	<u>Dale Engineering</u>	<u>(1) W. Elliot N.Y.S.D.O.T.</u>
(1) <u>D. F. McCarthy</u>	<u>Dale Engineering</u>	
(1) <u>H. Muskatt</u>	<u>Dale Engineering</u>	
(2) <u>J. A. Gomez</u>	<u>Dale Engineering</u>	
(2) <u>R. McCarty</u>	<u>N.Y.S.D.E.C. Dam Safety Section</u>	

N. F. Dunlevy Recorder

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	None	North abutment on north dam section has wetness on rock outcropping behind end of concrete wall.
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Abutments tied to rock. Island abutments have concrete wall tying dam into island section.	North abutment of north dam wall below spillway severely eroded at water line. Wall undermined and exposed in back.
DRAINS	None	
WATER PASSAGES	Small stop log passage adjacent to south dams south section between tainter gate and abutment	Some leakage through stop logs - minor.
FOUNDATION	Bedrock both dam sections.	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	South dam: Severe surface cracks & erosion along top horizontal cold joint. Surface erosion along length. North Dam: Limited deep surface erosion.	Surface cracks along south dam cold joint significant. North dam has what appears to be steel exposed at deep erosion.
STRUCTURAL CRACKING	None observed. Very close inspection prohibited due to tailwater condition.	
VERTICAL & HORIZONTAL ALIGNMENT	Good	
MONOLITH JOINTS	Significantly deteriorated in south dam. Flow through top portion of joints.	Depth of deterioration is visually up to 12 inches.
CONSTRUCTION JOINTS	Surface erosion is more significant along horizontal construction joints.	
STAFF GAGE OF RECORDER	None - Measure of discharge taken in power house.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	N/A	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	N/A	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	N/A	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	N/A	
RIPRAP FAILURES	N/A	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	N/A	
ANY NOTICEABLE SEEPAGE	N/A	
STAFF GAGE AND RECORDER	N/A	
DRAINS	N/A	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR Entire dam, both north and south sections.	See sheets 2 and 3	
APPROACH CHANNEL	Consists of entire reservoir.	
DISCHARGE CHANNEL	Consists of entire river width.	
BRIDGE AND PIERS	None.	

GATED SPILLWAY

Tainter gate - South end of south dam section

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	Downstream view shows concrete in fair condition.	Immediately below south spillway section is located a small earlier dam. The south section is missing on this structure.
APPROACH CHANNEL	No observation given.	
DISCHARGE CHANNEL	Directly into river channel. An abandoned dam located just downstream from the gate has been breached.	
BRIDGE AND PIERS	None	
GATES AND OPERATION EQUIPMENT	Electrically operated gate.	Gates are quite rusty, although not heavily deteriorated. Leakage exists around sides of gates.

OUTLET WORKS

Operates through powerhouse and tainter gate (sheet 7)

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	None	
INTAKE STRUCTURE	None	
OUTLET STRUCTURE	None	
OUTLET CHANNEL	None	
EMERGENCY GATE	None	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
<p>CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)</p>	<p>Unobstructed, no debris. Small dam immediately below south dam. N-M dam pool comes up to toe of north dam section.</p>	
<p>SLOPES</p>	<p>Pool of N-M dam on north section. Smaller south dam section has old dam and exposed bedrock channel below south section dam.</p>	
<p>APPROXIMATE NO. OF HOMES AND POPULATION</p>	<p>Approximately 12 residential structures and vacation cottages on north shore 15-20 feet above normal pool. N-M School Structure Station</p>	
	<p>1/2 mile downstream. City of Albany and Watervliet 3 miles downstream. Limited recreational use of reach below dam.</p>	

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER		

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Not significant	
SEDIMENTATION	No observation	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM _____

ID # _____

ITEM	REMARKS
AS-BUILT DRAWINGS	See this report
REGIONAL VICINITY MAP	See this report
CONSTRUCTION HISTORY	See this report
TYPICAL SECTIONS OF DAM	See this report
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	See this report
RAINFALL/RESERVOIR RECORDS	At powerhouse available from New York State Department of Transportation

ITEM	REMARKS
DESIGN REPORTS	None
GEOLOGY REPORTS	None
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None
POST-CONSTRUCTION SURVEYS OF DAM	None
BORROW SOURCES	---

ITEM	REMARKS
MONITORING SYSTEMS	---
MODIFICATIONS	New York State Department of Transportation reported
HIGH POOL RECORDS	New York State Department of Transportation reported
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	---
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None reported
MAINTENANCE OPERATION RECORDS	New York State Department of Transportation

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	See this report
OPERATING EQUIPMENT PLANS & DETAILS	New York State Department of Transportation records and some information given in this report.

CHECK LIST
HYDROLOGIC & HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 3455 sq. mi.
ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 185.00 w/ flashboards
184.00 w/o flashboards
ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): ---
ELEVATION MAXIMUM DESIGN POOL: ---
ELEVATION TOP DAM: 193

CREST:

a. Elevation 185.00 w/ flashboards
184.00 w/o flashboards
b. Type Crested spillway
c. Width See sections in report
d. Length 1600 feet
e. Location Spillway entire width
f. Number and Type of Gates 1 tainter gate

OUTLET WORKS:

a. Type through powerhouse
b. Location _____
c. Entrance Inverts _____
d. Exit Inverts _____
e. Emergency Draindown Facilities _____

HYDROMETEOROLOGICAL GATES:

a. Type ---
b. Location ---
c. Records ---

MAXIMUM NON-DAMAGING DISCHARGE: Stage 15-20 feet above normal

(NOTICE: After filling out one of these forms as completely as possible for each dam in your district, return it at once to the Conservation Commission, Albany.)

STATE OF NEW YORK
CONSERVATION COMMISSION
ALBANY

225 C
23 mch

DAM REPORT

June 12, 1916
(Date)

CONSERVATION COMMISSION,

DIVISION OF INLAND WATERS.

GENTLEMEN:

I have the honor to make the following report in relation to the structure known as the Convent Dam 1021 Superior Dam.

This dam is situated upon the Melanch Glass (Give name of stream)
in the Town of Westerlo Colonia Albany & Saratoga County,
about one mile (State distance) from the Village or City of Convent Station

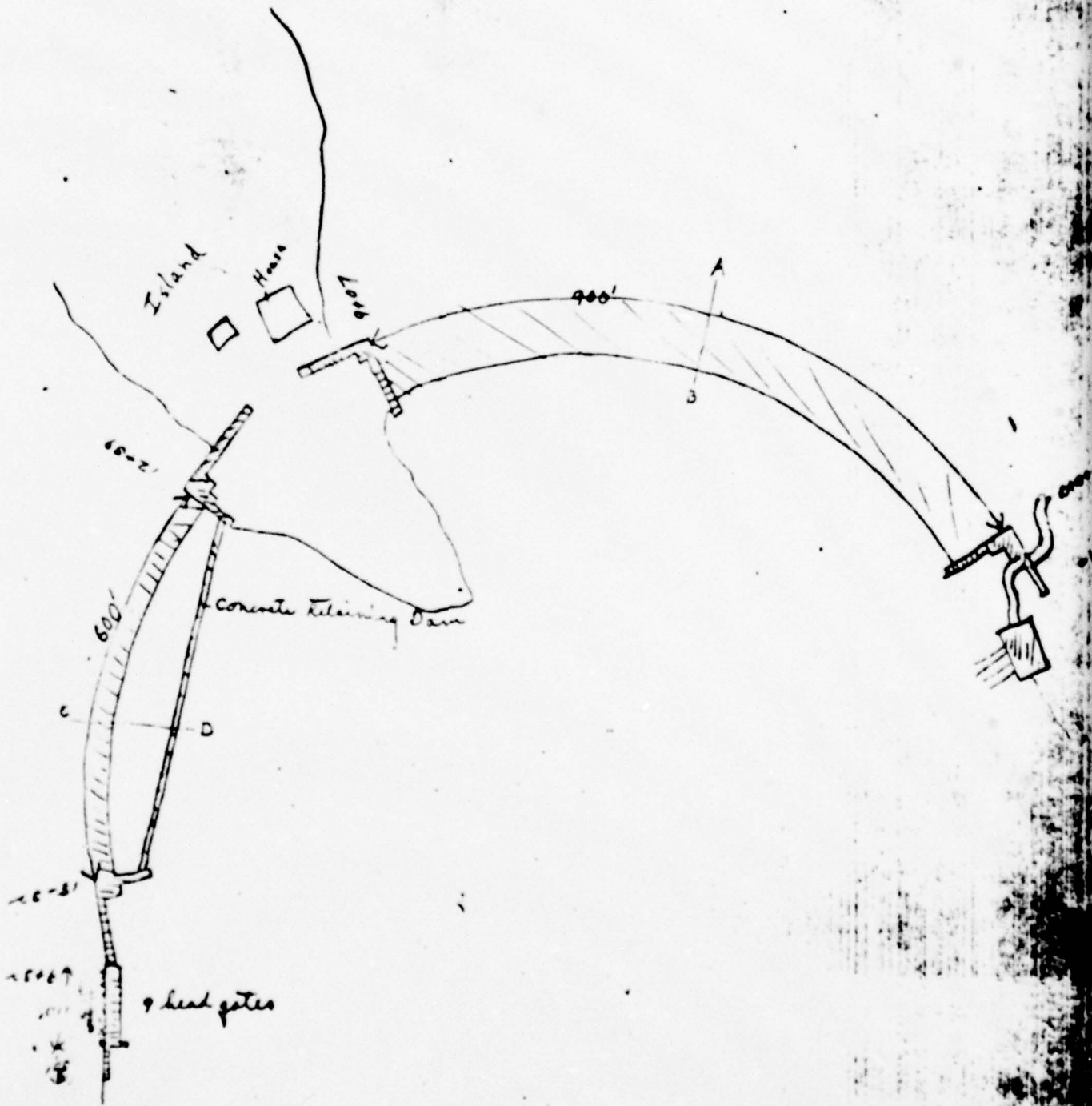
The distance down (Up or down) stream from the dam, to the Cohoes Falls (Give name of nearest important stream or of a bridge)
is about 1 1/2 mile (State distance)

The dam is now owned by State of New York (Give name and address in full)
and was built in or about the year 1909, and was extensively repaired or reconstructed during the year _____

As it now stands, the spillway portion of this dam is built of concrete (State whether of masonry, concrete or timber)
and the other portions are built of concrete (State whether of masonry, concrete, earth or timber with or without rock fill)

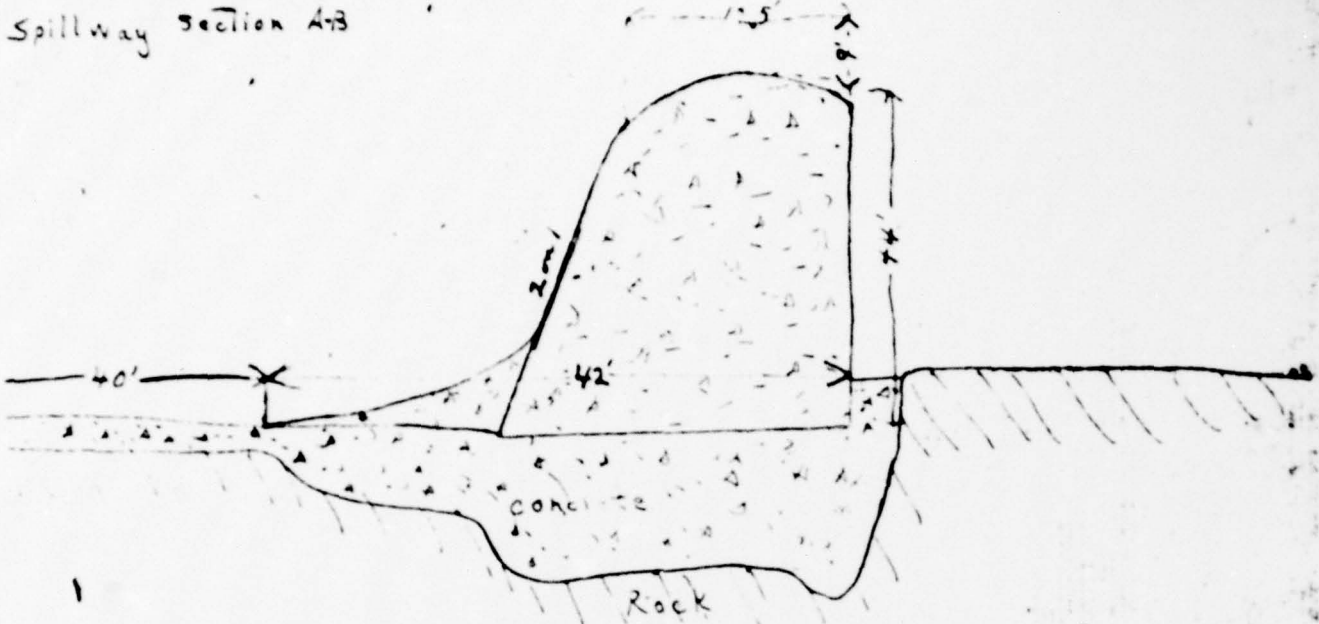
As nearly as I can learn, the character of the foundation bed under the spillway portion of the dam is rock and under the remaining portions such foundation bed is rock

(In the space below, make a third sketch showing the general plan of the dam, and its approximate position in relation to buildings or other conspicuous objects in the vicinity.)

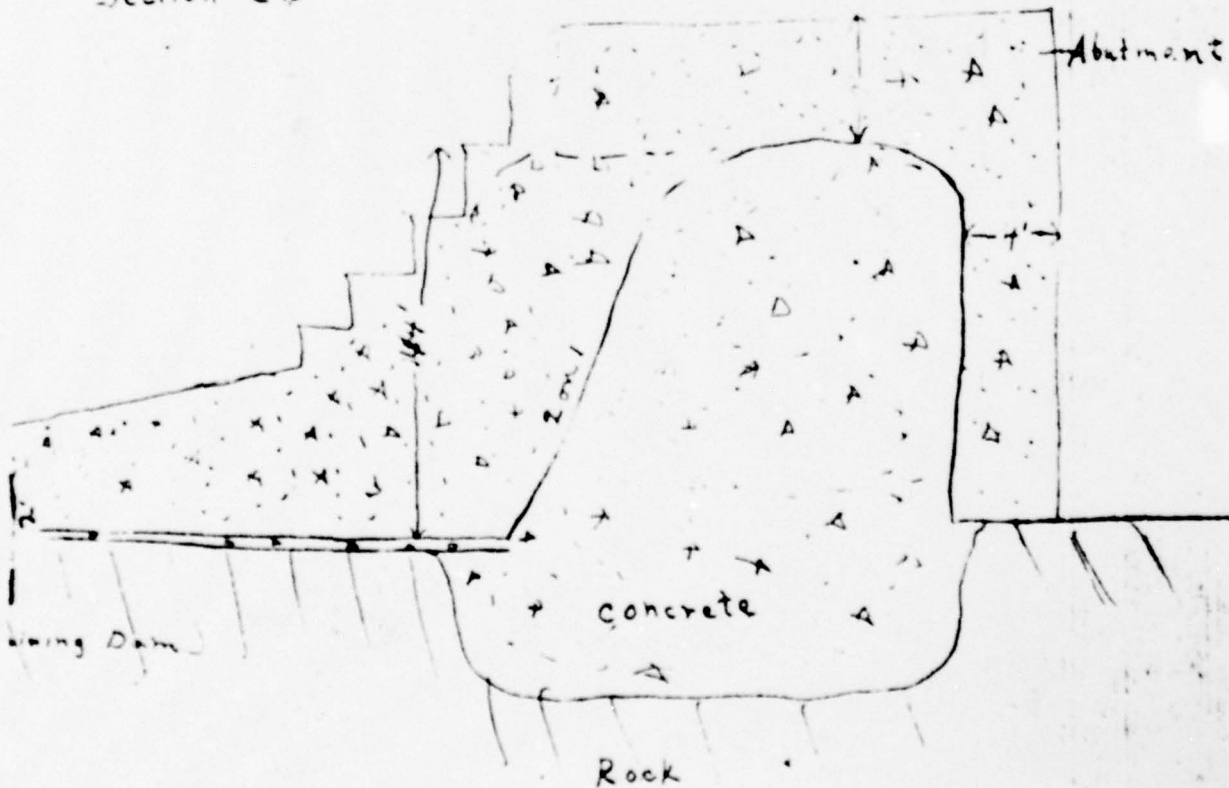


(In the space below, make one sketch showing the form and dimensions of a cross section through the spillway or waste-weir of this dam, and a second sketch showing the same information for a cross section through the other portion of the dam. Show particularly the greatest height of the dam above the stream bed, its thickness at the top, and thickness at the bottom, as nearly as you can learn.)

Spillway Section A-B



Section C-D



Distance of retaining dam to main dam varies with curvatures.

**NIAGARA
MOHAWK**

NIAGARA MOHAWK POWER CORPORATION / 300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202 / TELEPHONE (315) 474-1511

August 22, 1979

REC

AUG 24 1979

Mr. Neal F. Dunlevy
Stetson-Dale
Bankers Trust Building
Utica, New York 13501

Subject: Browns Falls Dam National Dam
Safety Inspection

Dear Neal:

Enclosed is one copy each of the following items:

The total length of this dam is 2150 feet. The spillway or waste-weir portion, is about 1500 feet long, and the crest of the spillway is about 9' feet below the top of the dam.

The number, size and location of discharge pipes, waste pipes or gates which may be used for drawing off the water from behind the dam, are as follows: 9 head gates (8'x10')

At the time of this inspection the water level above the dam was 6 in. 7
~~below~~
above the crest of the spillway.

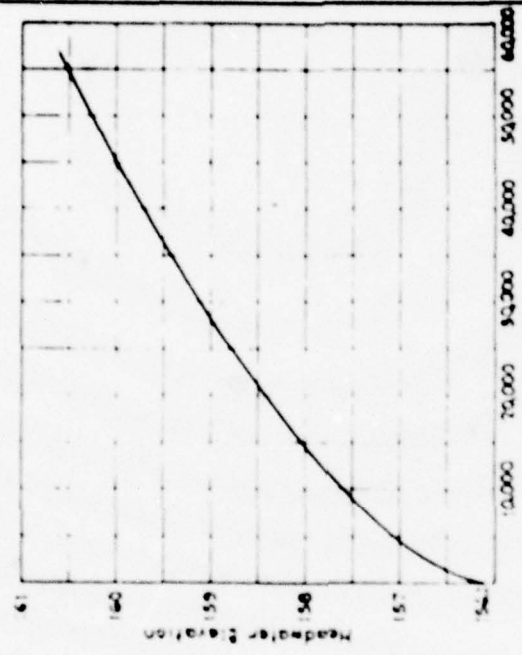
(State briefly, in the space below, whether, in your judgment, this dam is in good condition, or bad condition, describing particularly any leaks or cracks which you may have observed.)

Dam new and in good condition

RAQUETTE RIVER PROJECT #274

PROJECT #274

OSWEGO RIVER PROJECT #274

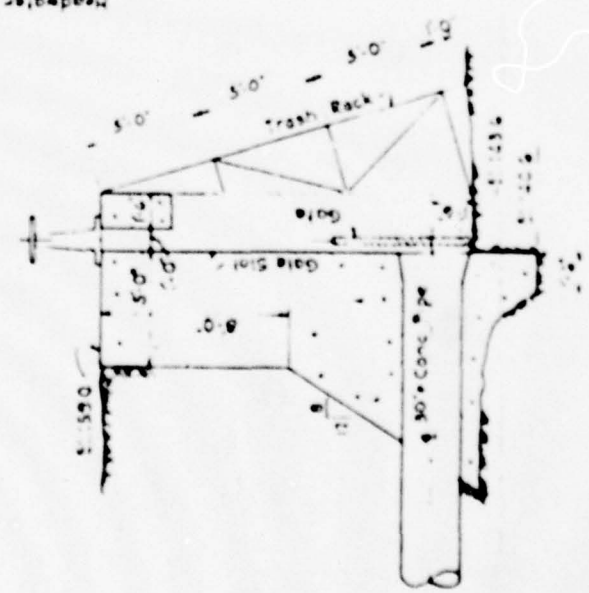


FLOOD DISCHARGE CAPACITY

THIS DRAWING IS A PART OF THE APPLICATION FOR LICENSE MADE BY THE UNDERSIGNED THIS 20TH DAY OF AUGUST 1965 NIAGARA MOHAWE POWER CORPORATION

BY *[Signature]*
 TITLE: *[Signature]*

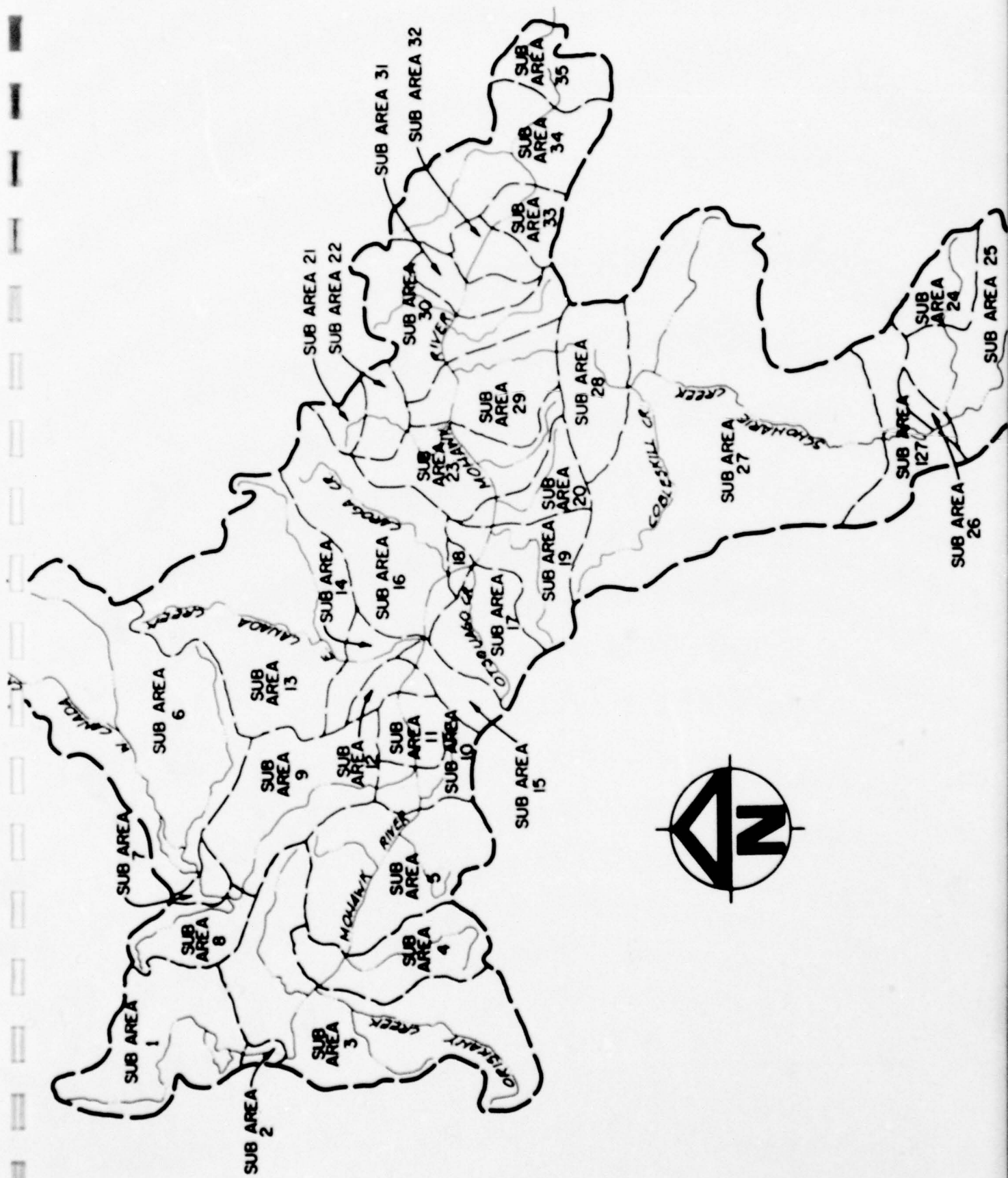
NIAGARA MOHAWE POWER CORPORATION
 PROJECT # 274
CONSTRUCTED SCHOOL STREET PROJECT
 GENERAL PLAN AND DETAILS OF DAM
 SHEET No. 1

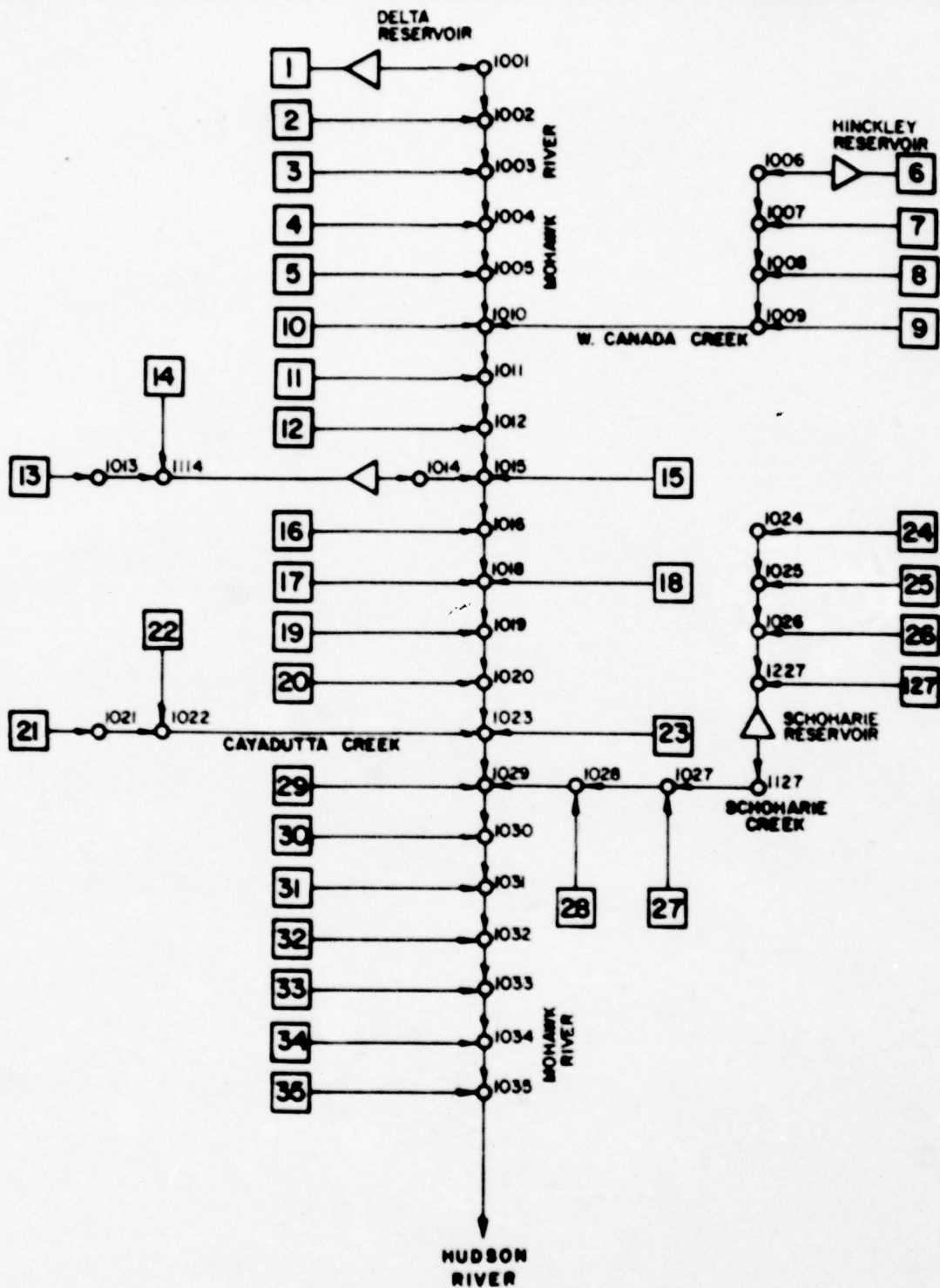


SECTION 4-1

APPENDIX C

HYDROLOGIC AND HYDRAULIC COMPUTATIONS







STETSON • DALE

BANKERS TRUST BUILDING
UTICA • NEW YORK • 13501
TEL 315-797-5800

DESIGN BRIEF

PROJECT NAME NEW YORK STATE DAM INSPECTION DATE 7-31-79

SUBJECT MOHAWK RIVER DRAINAGE BASIN PROJECT NO 2325

DEPTH - AREA - DURATION RELATIONSHIP * DRAWN BY JPG

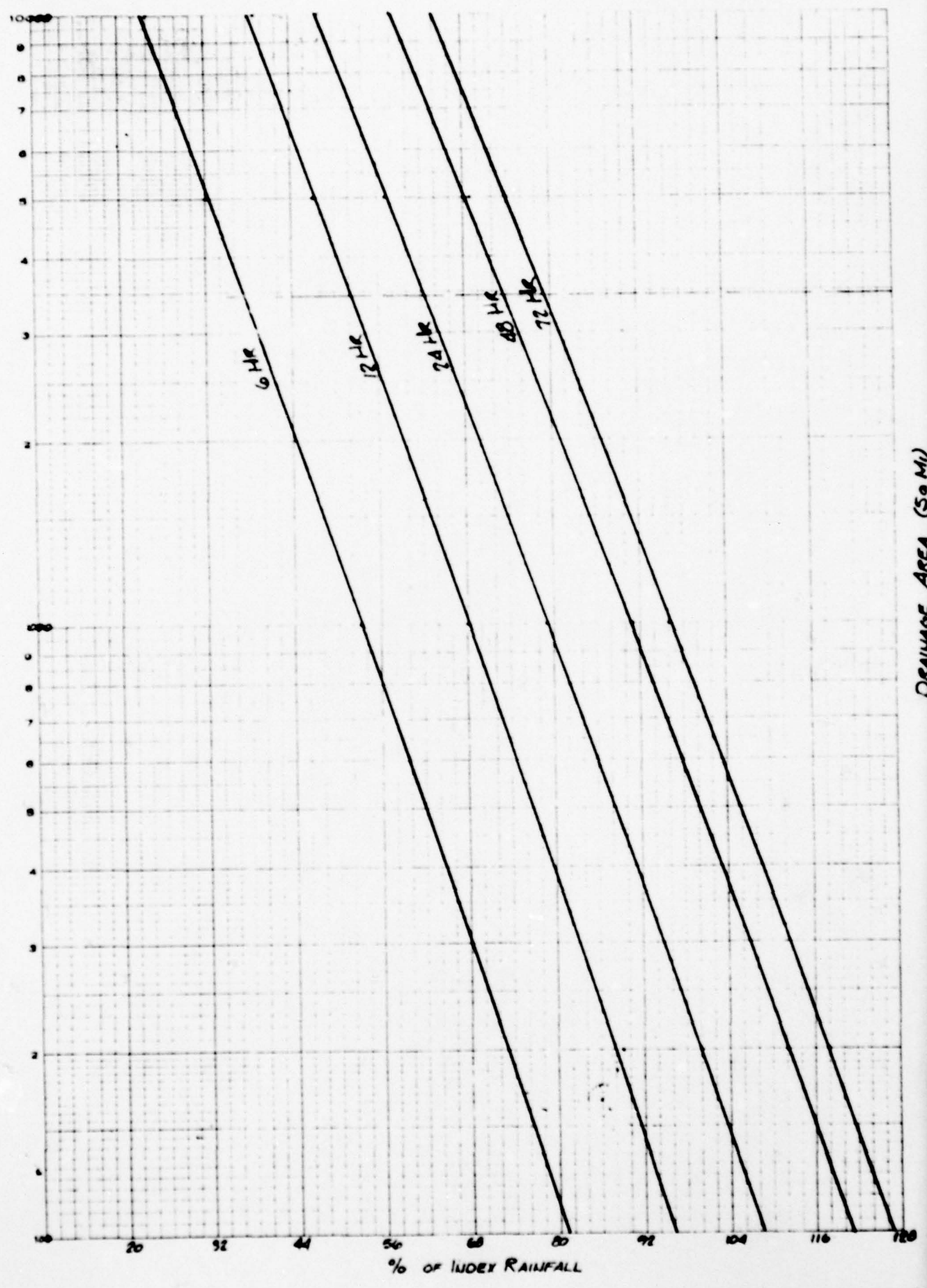
AREA	DURATION	DEPTH	% OF INDEX
200 Sq mi	6 Hr	16.0	73
	12 Hr	19.4	89
	24 Hr	21.9	100
	48 Hr	24.5	112
200 Sq mi	72 Hr	25.9	118
1000 Sq mi	6 Hr	11.5	53
	12 Hr	14.8	68
	24 Hr	17.3	79
	48 Hr	20.0	91
1000 Sq mi	72 Hr	21.0	96
5000 Sq mi	6 Hr	7.0	32
	12 Hr	10.3	47
	24 Hr	12.5	57
	48 Hr	15.1	69
5000 Sq mi	72 Hr	16.3	74
10000 Sq mi	6 Hr	5.3	24
	12 Hr	8.6	39
	24 Hr	10.5	48
	48 Hr	12.8	58
10000 Sq mi	72 Hr	14.0	64

← PMF INDEX RAINF

* FROM HYDROMETEOROLOGICAL REPORT N^o 51
SEPT 1976

<u>PMF</u>	<u>DURATION</u>	<u>% OF INDEX</u>
	6 Hr	37.5
	12 Hr	52.0
	24 Hr	62.5
	48 Hr	73.5
	72 Hr	79.0

SEM-LOGARITHMIC
2 CIRCLES X 60 DIVISIONS 16 DIV PER IN.



DRAINAGE AREA (Sq Mi)

% OF INDEX RAINFALL

Table 6.1

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
SUBBASIN CHARACTERISTICS

Subbasin No.	Area (mi ²)	Storage Area (% + 1.0)	Clark Coefficients		Snyder Coefficients		Recession Parameters	
			TC (hr)	R (hr)	LAG (hr)	CP (-)	RCSN (cfs)	RYOR (-)
1	150	1.02	15.0	7.3	12.3	.75	1900	1.3
2	7	1.00	7.0	4.5	5.9	.69	50	1.3
3	289	1.04	17.6	8.2	14.4	.76	4100	1.3
4	93	1.06	13.4	7.0	11.2	.74	1100	1.3
5	158	1.17	15.7	8.2	13.2	.75	2100	1.3
6	375	2.32	22.6	15.9	20.0	.58	5700	1.3
7	7	1.13	7.1	4.9	6.1	.66	50	1.3
8	53	1.03	11.6	6.2	9.7	.73	550	1.3
9	121	1.01	14.2	7.0	11.6	.75	1450	1.3
10	45	1.10	11.3	6.4	9.5	.72	500	1.3
11	27	1.03	9.8	5.6	8.2	.71	280	1.3
12	23	1.04	9.5	5.5	8.0	.72	250	1.3

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
 SUBBASIN 3-HOUR UNIT HYDROGRAPHS

Time (hrs)	1	2	3	4	5	6	7	8	9	10	11	12
3	698	152	953	527	623	478	136	409	632	354	291	266
6	2435	427	3354	1833	2192	1746	394	1407	2198	1217	970	877
9	4449	439	6314	3244	4083	3448	425	2325	3950	1995	1449	1275
12	5771	245	8818	3966	5474	5312	257	2474	4969	2075	1260	1061
15	5762	122	9963	3513	5782	6966	137	1850	4646	1530	772	625
18	4483	61	9342	2445	4838	8020	73	1134	3395	950	447	359
21	2953	30	7241	1580	3406	8365	39	695	2197	590	259	206
24	1945	15	4999	1021	2349	7813	21	426	1422	366	150	118
27	1281	7	3452	661	1620	6642	11	261	920	227	87	68
30	844		2383	425	1118	5495	6	160	595	141	50	39
33	556		1645	275	771	4547		98	385	88	29	22
36	366		1136	178	532	3762		60	249	54	17	
39	241		784	115	367	3113		37	161	34		
42	159		541	74	253	2575		23	104	21		
45	105		374	48	175	2131			68			
48	69		258		120	1763						
51			178		83	1459						
54			123		57	1207						
57						999						
60						826						
63						684						
66						566						
69						468						
72						387						
75						320						
78						265						
81						219						
84						181						
87						150						
90						124						
93						103						
96						85						
99						70						

All flows in cfs/unit rainfall.

Table 6.3

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
INITIAL FLOW AND INFILTRATION PARAMETERS

Subbasin No.	December, 1948		June, 1972		SPF and Transposed Agnes				
	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)			
1	90	.50	.045	250	0.25	.045	250	1.0	.075
2	7	.50	.045	7	2.00	.075	7	2.0	.075
3	200	.50	.040	540	2.00	.125	540	2.0	.125
4	50	.50	.040	140	2.00	.125	140	2.0	.125
5	100	.50	.040	265	2.00	.100	265	2.0	.100
6	280	.25	.055	725	0.10	.040	725	1.0	.075
7	7	.25	.045	7	0.10	.020	7	1.0	.075
8	25	.25	.045	72	0.10	.040	72	1.0	.075
9	70	.25	.045	190	0.10	.045	190	1.0	.075
10	20	.20	.045	60	0.35	.075	60	2.0	.075
11	10	.10	.040	32	0.30	.050	32	1.0	.075
12	10	.10	.040	27	0.30	.050	27	1.0	.075

Table 6.4
 MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
 ROUTING REACH CHARACTERISTICS

<u>Reach No.</u>	<u>Length</u> (mi)	<u>Slope</u> (ft/mi)	<u>Muskingum</u> <u>Parameters</u>		<u>X</u> (-)
			<u>NSTEPS</u> (-)	<u>K</u> (hrs.)	
1001-1002	5.2	8.7	1	1.0	.3
1002-1003	7.8	2.1	2	1.4	.3
1003-1004	5.2	2.1	1	2.0	.2
1004-1005	13.1	2.1	2	2.4	.2
1005-1010	3.9	2.1	1	1.5	.2
1006-1007		**	DUMMY LINK	**	
1007-1008		**	DUMMY LINK	**	
1008-1009	23.1	11.9	4	1.1	.3
1009-1010	4.4	14.1	1	0.7	.3
1010-1011	5.7	2.1	1	2.1	.2
1011-1012	4.6	2.1	1	1.7	.2

Table 6.5
 DELTA RESERVOIR
Storage-Discharge Relationship

<u>Elevation</u> (ft. above MSL)	<u>Storage</u> (acre-ft)	<u>Discharge</u> (cfs)
550	62330	0
550.5	64170	337
551	65540	954
551.5	66920	1753
552	68750	2698
552.5	69900	3771
553	71500	4957
555	76770	10666
561.8	94617	30000

Initial Storage Level
(acre-ft)

December 1948	(not simulated)
June 1972	64170
SPF and Transposed Agnes	62330

Table 6.6
HINCKLEY RESERVOIR
Storage-Discharge Relationship

<u>Elevation</u> (ft. above MSL)	<u>Storage</u> (acre-ft)	<u>Discharge</u> (cfs)
1225	157900	0
1225.5	161100	474
1226	164540	1340
1226.5	167750	2462
1227	170960	3790
1227.5	174400	5297
1230	190670	14982
1239	211515	50000

Initial Storage Level
(acre-ft)

December 1948	(not simulated)
June 1972	157900
SPF and Transposed Agnes	157900

Table 6.7

MOHAWK BASIN ABOVE LITTLE FALLS, N. Y.
SUBBASIN RAINFALL AND PEAK FLOWS

Subbasin	December, 1948			June, 1972			SPF			Transposed Agnes		
	Rainfall (in)		Peak Flow (cfs)	Rainfall (in)		Peak Flow (cfs)	Rainfall (in)		Peak Flow (cfs)	Rainfall (in)		Peak Flow (cfs)
	Total	Excess		Total	Excess		Total	Excess		Total	Excess	
1	3.69	1.51	5866	4.14	2.50	10796	12.0		47388	11.3	8.1	30707
2	3.55	1.46	351	3.99	1.77	634	13.5		8259	10.7	5.7	1095
3	3.38	1.03	5125	3.94	1.28	10536	11.4		69424	10.7	3.9	25050
4	3.62	1.37	2651	4.17	1.46	4670	12.4		30463	10.7	3.9	9068
5	3.62	1.44	4373	3.76	1.33	6029	12.0		44203	11.9	7.6	30068
6	5.42	2.40	9767	4.07	2.40	13693	11.2		63107	14.0	10.7	69847
7	4.96	2.47	475	2.53	1.82	572	13.5		4023	12.7	9.5	2227
8	4.34	2.19	3132	2.57	1.26	2627	12.8		21441	12.4	9.2	13350
9	4.41	1.95	4417	3.59	1.83	5471	12.2		40602	13.3	10.0	30669
10	3.28	1.05	1171	3.28	0.87	1266	12.9		18330	12.6	8.9	11482
11	3.55	1.40	889	2.40	1.14	628	13.2		12558	13.3	10.2	8152
12	3.72	1.60	809	2.28	1.24	601	13.3		10996	13.7	10.6	7269

Table 6.8

MOHAWK BASIN ABOVE LITTLE FALLS, N.Y.
SIMULATED PEAK FLOWS AT CONTROL POINTS
(All Flows in cfs)

<u>Control Point</u>	<u>Description</u>	<u>December 1948</u>	<u>June 1972</u>	<u>SPF</u>	<u>Transposed Agnes</u>	<u>Drainage Area (mi²)</u>
1001	Mohawk R. at Delta Dam, USGS 3360	651 ^R	6335 ^R	28630	21819	150
1002	Mohawk R. at Rome, NY above Barge Canal	869	6549	28733	22539	157
1003	Mohawk R. at Oriskany, NY	5720	17016	83307	47381	446
1004	Mohawk R. at Utica, NY	8317	20029	96011	54269	539
1005	Mohawk R. at Ilion, NY	12254	22693	112525	66034	697
1006	W. Canada Cr. below Hinckley Reservoir, USGS 3440	300 ^R	6600	35759	45461	375
1007	W. Canada Cr. at Trenton Falls, NY	775	6648	35759	45511	382
1008	W. Canada Cr. below Cincinnati Cr.	3848	7114	36264	46977	435
1009	W. Canada Cr. at Kast Bridge, USGS 3460	8054	9408	58143	58538	556
1010	Mohawk R. below W. Canada Cr.	16903	31438	151042	125403	1298
1011	Mohawk R. at Little Falls, NY	17258	31204	150221	125863	1325
1012	Mohawk R. at Little Falls, USGS 3470	17413	31132	149572	126143	1348

R = Assumed Regulated Discharge

Table 6.11
 MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
 SUBBASIN CHARACTERISTICS

Subbasin No.	Area (mi ²)	Storage Area (% + 1:0)	Clark Coefficients		Snyder Coefficients		Recession Parameters	
			TC (hr)	R (hr)	LAG (hr)	CP (-)	ORCSN (cfs)	RYTOR (-)
13	261	1.01	17.1	7.9	14.0	.77	3650	1.3
14	30	1.01	10.0	5.6	8.3	.71	320	1.3
15	35	1.03	10.5	5.9	8.9	.73	400	1.3
16	151	3.25	18.6	17.9	17.4	.59	3500	1.3
17	59.2	1.01	11.9	6.3	10.0	.74	600	1.3
18	13.1	1.08	8.2	5.2	7.0	.69	100	1.3
19	72	1.00	12.4	6.4	10.3	.74	700	1.3
20	55	1.05	11.8	6.4	9.9	.74	550	1.3
21	12.7	1.39	8.6	6.3	7.4	.65	120	1.3
22	23	1.12	9.6	5.9	8.2	.70	250	1.3
23	84	1.07	13.1	6.9	11.1	.74	870	1.3
24	39.3	1.18	11.1	6.6	9.4	.70	420	1.3
25	186.5	1.14	16.2	8.2	13.4	.74	2500	1.3
26	10.2	1.00	7.7	4.7	6.3	.69	70	1.3
127	78	1.09	13.0	6.9	10.9	.74	800	1.3
27	491	1.19	20.8	9.9	17.2	.76	6800	1.3
28	78	1.02	12.8	6.6	10.5	.74	800	1.3
29	87	1.03	13.1	6.8	11.0	.75	920	1.3
30	103	1.90	15.6	11.1	13.8	.67	1150	1.3
31	28	1.06	10.0	5.8	8.3	.71	300	1.3
32	32	2.14	11.7	10.2	10.4	.61	350	1.3
33	38	1.02	10.7	5.9	9.0	.73	400	1.3
34	108	1.39	14.8	8.8	12.6	.71	1250	1.3
35	33	1.07	10.4	6.0	8.9	.73	370	1.3

Table 6.12
 MOHAWK BASIN, LITTLE FALLS, N.Y. TO MOUTH
 SUBBASIN 3-HOUR UNIT HYDROGRAPHS

Time (hrs)	13	14	15	16	17	18	19	20	21	22	23	24
3	933	313	332	231	442	195	492	409	152	249	496	309
6	3275	1047	1124	847	1520	610	1696	1410	494	827	1723	1065
9	6134	1585	1752	1684	2536	771	2893	2350	676	1226	3026	1739
12	8443	1408	1644	2535	2767	554	3313	2550	540	1055	3645	1786
15	9333	881	1089	3156	2113	306	2660	1944	333	648	3151	1310
18	8411	511	645	3395	1296	170	1679	1204	205	384	2144	827
21	6264	296	382	3168	795	94	1042	746	127	227	1380	522
24	4260	172	226	2697	488	52	647	462	78	135	889	329
27	2898	100	134	2280	299	29	402	286	48	80	572	208
30	1971	58	79	1928	183	16	249	177	30	47	368	131
33	1341	33	47	1630	113	9	155	110	18	28	237	83
36	912	19	28	1378	69		96	68	11	17	153	52
39	620		17	1165	42		60	42	7		98	33
42	422			985	26		37	26			63	21
45	287			833							41	
48	195			704								
51	133			595								
54	90			503								
57				425								
60				360								
63				304								
66				257								
69				217								
72				184								
75				155								
78				131								
81				111								
84				94								
87				79								
90				67								
93				57								
96				48								
99				41								
102				34								
105				29								

All flows in cfs/unit rainfall.

Table 6.12 (Cont'd)

Time (hrs)	25	26	27	28	29	30	31	32	33	34	35
3	695	183	1080	502	525	313	289	162	350	434	311
6	2446	548	3848	1735	1820	1124	967	579	1187	1535	1053
9	4579	629	7363	2998	3185	2148	1465	1013	1869	2851	1641
12	6221	401	10879	3513	3821	2967	1304	1177	1789	3771	1539
15	6721	208	13431	2912	3280	3259	821	1013	1208	3855	1023
18	5814	108	14333	1895	2209	2898	483	753	718	3125	613
21	4204	56	13446	1192	1405	2239	284	560	425	2223	367
24	2907	29	10867	750	894	1708	167	416	253	1576	220
27	2010	15	7999	472	569	1302	98	309	150	1117	132
30	1389	8	5889	297	362	993	58	230	89	792	79
33	961		4335	187	230	758	34	171	53	562	47
36	664		3191	118	147	578	20	127	32	398	28
39	459		2349	74	93	441		94	19	282	17
42	317		1729	47	59	336		70		200	
45	219		1273		38	256		52		142	
48	152		937			195		39		101	
51	105		690			149		29		71	
54	73		508			114		21		51	
57			374			87		16		36	
60			275			66		12			
63			203			50					
66			149			38					
69						29					

Table 6.13
 MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
 INITIAL FLOW AND INFILTRATION PARAMETERS

Subbasin No.	December, 1948			June, 1972			SPF and Transposed Agnes		
	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)	Initial Flow (cfs)	Initial Loss (in)	Constant Loss (in/hr)
13	180	0.10	0.04	480	0.10	0.02	480	1.0	0.075
14	12	0.10	0.04	37	0.10	0.02	37	1.0	0.075
15	15	0.10	0.04	44	0.10	0.02	44	1.0	0.075
16	90	0.40	0.04	250	0.50	0.05	250	1.0	0.075
17	29	0.40	0.04	82	0.50	0.05	82	1.0	0.075
18	8	0.40	0.04	14	0.50	0.05	14	1.0	0.075
19	36	0.40	0.04	103	0.50	0.05	103	1.0	0.075
20	26	0.40	0.04	75	0.50	0.05	75	1.0	0.075
21	8	0.40	0.05	13	1.30	0.05	13	1.3	0.075
22	10	0.40	0.05	27	1.30	0.05	27	1.3	0.075
23	44	0.40	0.05	125	1.00	0.03	125	1.0	0.075
24	13	0.50	0.055	51	2.00	0.03	51	2.0	0.075
25	120	0.50	0.05	320	2.00	0.013	320	2.0	0.075
26	8	0.50	0.05	10	1.50	0.05	10	1.5	0.075
127	42	0.50	0.055	115	1.50	0.05	115	1.5	0.075
27	380	0.50	0.055	1010	1.25	0.01	1010	1.25	0.075
28	40	0.50	0.05	115	1.25	0.01	115	1.25	0.075
29	46	0.50	0.04	132	1.10	0.04	132	1.1	0.075
30	57	0.10	0.05	160	0.70	0.05	160	1.0	0.075
31	11	0.10	0.05	34	0.70	0.05	34	1.0	0.075
32	13	0.10	0.05	40	0.25	0.04	40	1.0	0.075
33	17	0.10	0.05	49	0.25	0.04	49	1.0	0.075
34	60	0.10	0.05	170	0.25	0.04	170	1.0	0.075
35	13	0.10	0.05	41	0.25	0.04	41	1.0	0.075

Table 6.14
 MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
 ROUTING REACH CHARACTERISTICS

<u>Reach No.</u>	<u>Length</u> (mi)	<u>Slope</u> (ft/mi)	<u>Muskingum</u> <u>Parameters</u>		<u>K</u> (-)
			<u>NSTEPS</u> (-)	<u>K</u> (hrs.)	
1012-1015	2.3	2.1	1	0.9	.2
1013-1114		**	DUMMY LINK	**	
1114-1014	(Kyser and E. Canada Lakes)		1	14.0	.0
1014-1015	1.4	14.3	1	1.0	.2
1015-1016	6.6	2.1	1	2.5	.2
1016-1018	2.5	2.1	1	1.0	.2
1017-1018		**	DUMMY LINK	**	
1018-1019	3.3	2.1	1	1.2	.2
1019-1020	3.1	2.1	1	1.2	.2
1020-1023	8.3	2.1	2	1.6	.2
1021-1022		**	DUMMY LINK	**	
1022-1023	8.5	41.5	1	1.4	.3
1023-1029	5.5	2.1	1	2.5	.2
1024-1025	12.2	27.9	1	1.3	.3
1025-1026		**	DUMMY LINK	**	
1127-1027	33.0	11.8	4	1.4	.3
1027-1028	6.6	9.1	1	1.2	.2
1028-1029	15.2	15.3	1	2.1	.2
1029-1030	5.6	2.1	1	2.1	.2
1030-1031	3.4	2.1	1	1.3	.2
1031-1032	5.6	2.1	1	2.1	.2
1032-1033	8.0	2.1	2	1.5	.2
1033-1034	9.5	2.1	2	1.8	.2
1034-1035	10.2	13.1	1	1.5	.2

Table 6.15
 SCHOHARIE RESERVOIR
Storage-Discharge Relationship

<u>Elevation</u> (ft. above MSL)	<u>Storage</u> (acre-ft)	<u>Discharge</u> (cfs)
1130	60660	0
1131	61750	3480
1132	62840	9890
1133	63920	18160
1134	65010	27960
1135	66100	39080
1139.6	71091	90000

Initial Storage Level
(acre-ft)

December 1948	15530
June 1972	60660
SPF and Transposed Agnes	60660

Table 6.16

MOHAWK BASIN, LITTLE FALLS, N.Y. TO MOUTH
SUBBASIN RAINFALL AND PEAK FLOWS

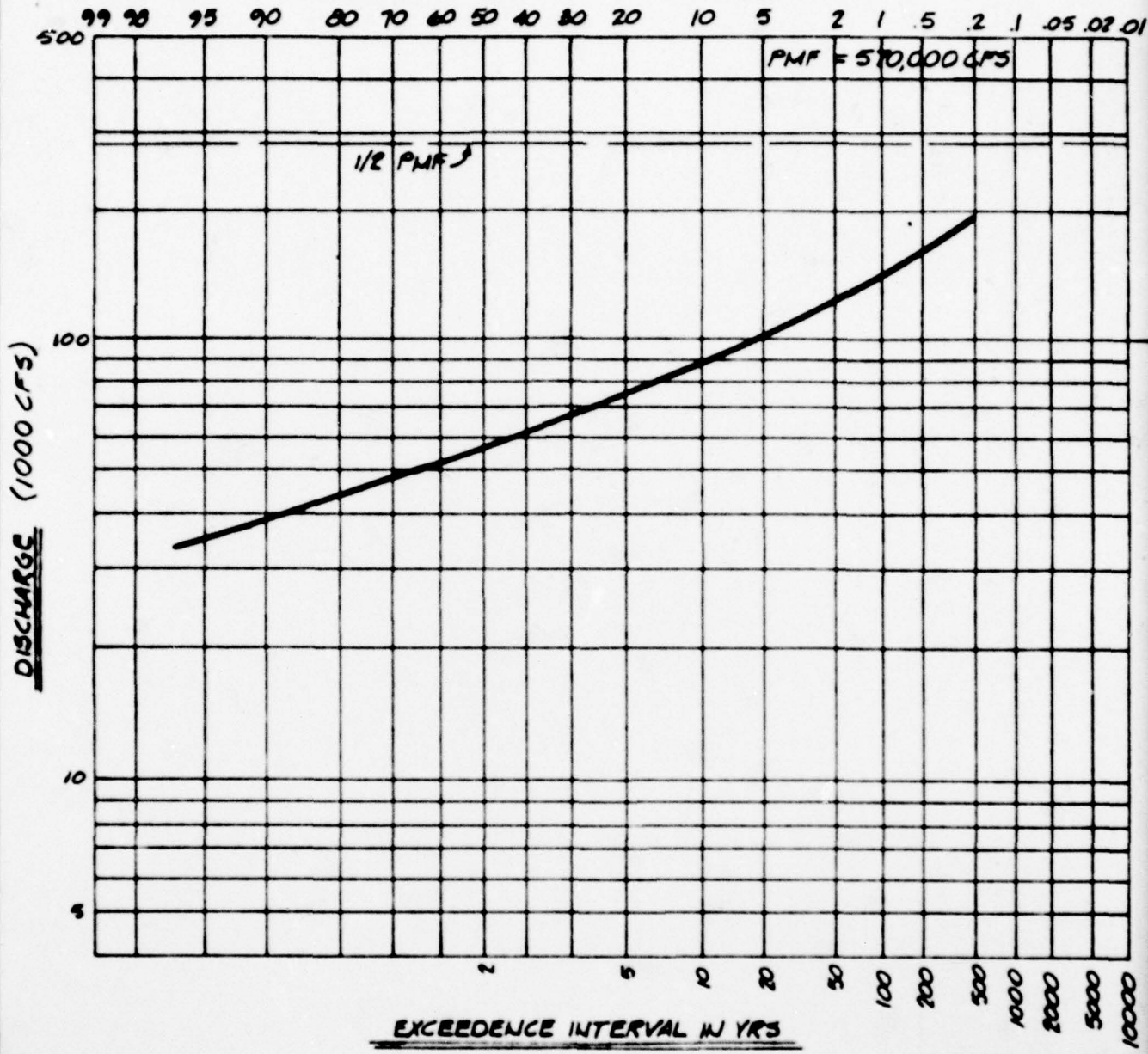
Subbasin	December, 1948			June, 1972			SPF			Transposed Agnes		
	Rainfall (in)		Peak	Rainfall (in)		Peak	Rainfall (in)		Peak	Rainfall (in)		Peak
	Total	Excess	Flow (cfs)	Total	Excess	Flow (cfs)	Total	Excess	Flow (cfs)	Total	Excess	Flow (cfs)
13	4.53	2.24	8000	2.52	1.65	8711	11.5		70974	13.9	10.7	68095
14	3.76	2.14	1435	2.03	1.59	850	13.1		13765	14.0	10.8	9576
15	3.43	1.17	953	1.69	1.27	756	13.1		15449	13.6	10.5	10565
16	4.34	1.83	3731	2.76	1.48	1810	12.0		27889	14.0	10.8	27973
17	3.98	1.56	2165	2.56	1.45	1490	12.7		23618	14.3	11.2	18047
18	4.07	1.58	429	2.90	1.78	510	13.4		6875	15.3	12.2	4895
19	4.53	2.04	3611	2.67	1.58	1955	12.6		27614	13.9	10.7	20949
20	4.40	2.13	2498	2.43	1.24	1096	12.8		21927	13.2	10.0	15206
21	5.19	2.11	511	3.36	1.68	366	13.4		5981	11.6	8.6	3973
22	5.12	2.05	957	3.36	1.69	679	13.3		10655	11.9	8.9	7538
23	4.54	1.60	3364	2.68	1.39	1500	12.5		30114	13.1	10.0	22043
24	6.03	2.97	2469	7.16	4.59	2740	13.0		15973	11.0	7.4	9154
25	5.92	3.07	10185	6.18	3.99	16152	11.8		52595	11.1	7.0	29251
26	4.46	1.76	505	3.85	1.73	446	13.4		5747	11.1	7.2	2076
127	4.46	1.40	2589	3.89	1.78	2573	12.5		28157	10.7	6.8	12464
27	4.48	1.40	12611	3.08	1.57	6670	10.9		103558	12.0	8.1	81426
28	4.47	2.01	3832	2.63	1.44	1412	12.5		29052	14.8	11.5	23896
29	5.24	3.01	6098	2.40	1.03	1173	12.4		31436	12.9	9.9	28406
30	5.76	3.17	6387	2.88	1.51	2202	12.3		27188	11.4	8.5	22887
31	5.59	3.03	2090	2.64	1.28	791	13.2		12756	11.1	8.2	8521
32	5.24	2.68	1864	2.31	0.61	426	13.1		10381	10.8	8.2	7702
33	5.24	2.68	2576	2.27	0.58	518	13.0		16684	10.5	8.0	11416
34	5.40	2.84	6716	2.39	0.60	1175	12.3		32452	8.4	5.9	19529
35	5.85	3.46	3170	1.59	0.54	404	13.1		14498	6.8	4.1	4479

Table 6.17

MOHAWK RIVER, LITTLE FALLS, N.Y. TO MOUTH
SIMULATED PEAK FLOWS AT CONTROL POINTS
(All Flows in cfs)

Control Point	Description	December 1948	June 1972	SPF	Transposed Agnes	Drainage Area (mi ²)
1013	E. Canada Cr. at Dolgeville, N.Y.	8000	8711	70974	68095	261
1014	E. Canada Cr. at East Creek, USGS 3480	6907	5615	46206	52369	291
1015	Mohawk R. below E. Canada Cr	23401	36010	183761	176014	1674
1016	Mohawk R. Below Caroga Cr.	25026	36651	194176	196968	1825
1017	Otsuago Cr. at Fort Plain, USGS 3490	2156	1490	23618	18047	59.2
1018	Mohawk R. Below Otsuago Cr.	26324	37158	195199	203707	1897.3
1019	Mohawk R. Below Canajoharie Cr.	29087	37673	196138	212635	1969.3
1020	Mohawk R. at Sprakers, N.Y.	30862	37899	196354	218553	2024.3
1021	Cayadutta Cr. at Gloversville, N.Y.	511	366	5981	3973	12.7
1022	Cayadutta Cr. at Johnstown, N.Y.	1467	1045	16289	11498	35.7
1023	Mohawk R. Below Cayadutta Cr.	33528	38595	195513	229900	2144
1024	Batavia Kill at Windham, N.Y.	2469	2740	15973	9154	39.3
1025	Schoharie Cr. Below Batavia Kill	12391	18784	64462	37654	225.8
1026	Schoharie Cr. at Prattsville, USGS 3500	12664	19025	66414	39513	236
1127	Schoharie Res. Outflow at Gilboa Dam	2073	21070	87488	51789	314
1027	Schoharie Cr. Below Cobleskill Cr.	12661	26334	173316	131666	805
1028	Schoharie Cr. at Burtonsville, USGS 3515	15359	26797	180196	149922	883
1029	Mohawk R. below Schoharie Cr.	54800	64118	293924	379254	3114
1030	Mohawk R. at Amsterdam, N.Y.	60953	64116	297861	395809	3217
1031	Mohawk R. at Cranesville, N.Y.	62612	64026	297090	397365	324 ^c
1032	Mohawk R. at Rotterdam Jct., N.Y.	63986	63525	295736	398075	3277
1033	Mohawk R. at Schenectady, N.Y.	65146	63339	293535	396922	3315
1034	Mohawk R. at Vischer Ferry, N.Y.	69566	63320	291113	397577	3423
1035	Mohawk R. at Cohoes, USGS 3575	70486	63291	290206	397659	3456

EXCEEDENCE FREQUENCY PER 100 YRS



EXCEEDENCE INTERVAL IN YRS

CRESCENT DAM

DISCHARGE - FREQUENCY
CURVE

1.....
 * FLOOD FLOW FREQUENCY ANALYSIS *
 * PRELIMINARY ----- JUNE 1976 *

0
 0**TITLE CARD(S)**
 TT MUHAWK RIVER AT CUMBOES, N.Y.
 TT 1918-1975
 TT D.A. = 3456 SQ. MI.
 0**JOB CARD(S)**

IPPC ISAFX IPRUT IFMT IAYR IUNIT
 J1 2 1 0 1 0 1

0**STATION IDENTIFICATION**
 ID 01357500 MUHAWK RIVER AT CUMBOES, N.Y.
 0**GENERALIZED SKEW**
 GS .70
 0**SYSTEMATIC FLOOD PEAKS**
 DH 58 GR CARDS SUPPLIED
 0**END OF INPUT DATA**

ED

PRELIMINARY RESULTS

-ANNUAL PEAKS - 01357500 MUHAWK RIVER AT CUMBOES, N.Y.

.....
DATA ANALYZED..........ORDERED DATA.....*

		WATER			MEDIAN					
MON	DAY	YEAR	FLOW	RANK	YEAR	FLOW	PLOT POS			
*	0	0	1918	45400.	*	1	1964	143000.	.0120	*
*	0	0	1919	35000.	*	2	1936	130000.	.0291	*
*	0	0	1920	64500.	*	3	1938	102000.	.0462	*
*	0	0	1921	47100.	*	4	1956	100000.	.0634	*
*	0	0	1922	56400.	*	5	1949	86300.	.0805	*
*	0	0	1923	58300.	*	6	1960	83300.	.0976	*
*	0	0	1924	71500.	*	7	1948	82700.	.1147	*
*	0	0	1925	57500.	*	8	1974	80900.	.1318	*
*	0	0	1926	52600.	*	9	1951	77300.	.1490	*
*	0	0	1927	54800.	*	10	1975	74200.	.1661	*
*	0	0	1928	54800.	*	11	1950	72800.	.1832	*
*	0	0	1929	72000.	*	12	1929	72000.	.2003	*
*	0	0	1930	58500.	*	13	1961	71900.	.2175	*
*	0	0	1931	53000.	*	14	1924	71500.	.2346	*
*	0	0	1932	41000.	*	15	1920	64500.	.2517	*
*	0	0	1933	47600.	*	16	1959	64400.	.2688	*
*	0	0	1934	45200.	*	17	1943	63900.	.2860	*
*	0	0	1935	61100.	*	18	1940	63000.	.3031	*
*	0	0	1936	130000.	*	19	1962	61900.	.3202	*
*	0	0	1937	48900.	*	20	1963	61600.	.3373	*
*	0	0	1938	102000.	*	21	1935	61100.	.3545	*
*	0	0	1939	51000.	*	22	1952	60800.	.3716	*
*	0	0	1940	24000.	*	23	1977	59000.	.3887	*

0	0	0	1941	49100.	*	24	1946	58300.	.4058
0	0	0	1942	47200.	*	25	1923	58300.	.4229
0	0	0	1943	63900.	*	26	1972	58100.	.4401
0	0	0	1944	46000.	*	27	1925	57500.	.4572
0	0	0	1945	47500.	*	28	1954	56800.	.4743
0	0	0	1946	56300.	*	29	1922	56400.	.4914
0	0	0	1947	51300.	*	30	1970	56400.	.5085
0	0	0	1948	62700.	*	31	1968	55800.	.5257
0	0	0	1949	86300.	*	32	1973	55800.	.5428
0	0	0	1950	72800.	*	33	1928	54800.	.5599
0	0	0	1951	77300.	*	34	1927	54800.	.5771
0	0	0	1952	60800.	*	35	1926	52600.	.5942
0	0	0	1953	59000.	*	36	1955	51500.	.6113
0	0	0	1954	56800.	*	37	1947	51300.	.6284
0	0	0	1955	51500.	*	38	1939	51000.	.6455
0	0	0	1956	100000.	*	39	1941	49100.	.6627
0	0	0	1957	23000.	*	40	1937	48900.	.6798
0	0	0	1958	34700.	*	41	1933	47600.	.6969
0	0	0	1959	64400.	*	42	1945	47500.	.7140
0	0	0	1960	63300.	*	43	1942	47200.	.7312
0	0	0	1961	71900.	*	44	1921	47100.	.7483
0	0	0	1962	61900.	*	45	1944	46000.	.7654
0	0	0	1963	61600.	*	46	1918	45400.	.7825
0	0	0	1964	143000.	*	47	1934	45200.	.7997
0	0	0	1965	27800.	*	48	1969	42300.	.8168
0	0	0	1966	32700.	*	49	1932	41000.	.8339
0	0	0	1967	24600.	*	50	1971	40600.	.8510
0	0	0	1968	55800.	*	51	1958	39700.	.8682
0	0	0	1969	42300.	*	52	1930	38500.	.8853
0	0	0	1970	56400.	*	53	1919	35000.	.9024
0	0	0	1971	40600.	*	54	1931	33000.	.9195
0	0	0	1972	58100.	*	55	1966	32700.	.9366
0	0	0	1973	55800.	*	56	1965	27800.	.9538
0	0	0	1974	80900.	*	57	1967	24600.	.9709
0	0	0	1975	74200.	*	58	1957	23000.	.9880

PRELIMINARY RESULTS

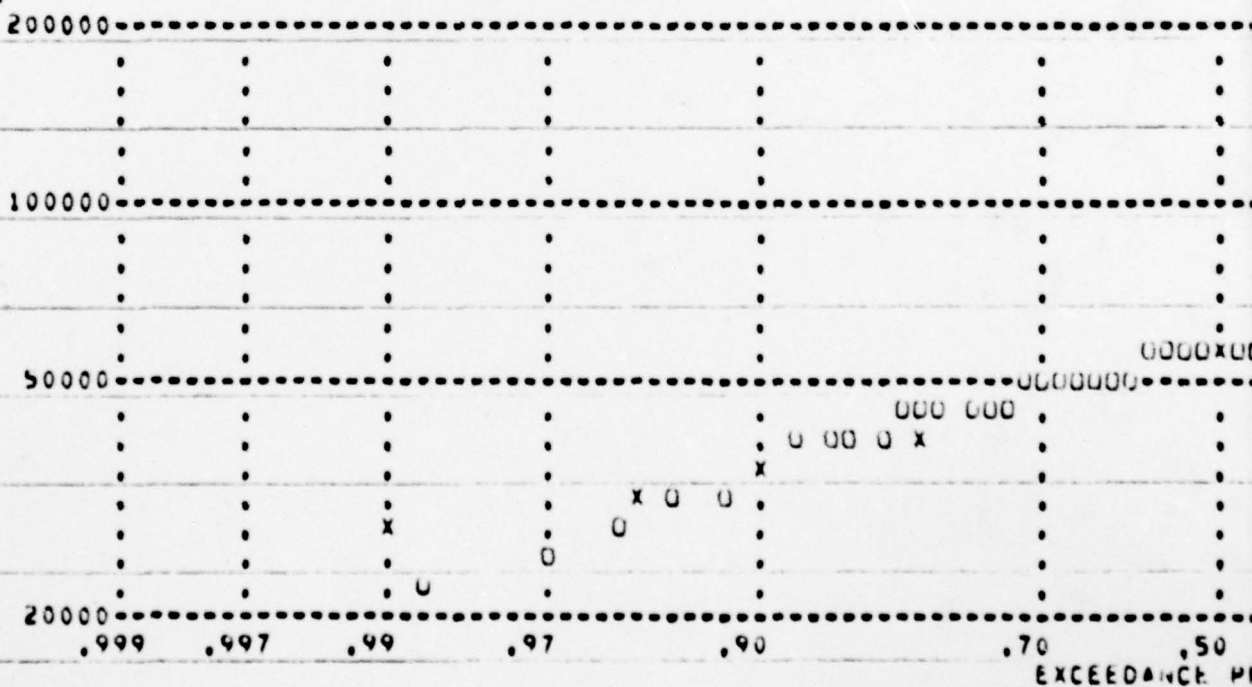
-FREQUENCY CURVE- 01357500 HUDAK RIVER AT COMUES, N.Y.

.....PEAK FLOWS.....		...CONFIDENCE LIMITS...	
COMPUTED	EXPECTED	EXCEEDANCE	PROBABILITY
PROBABILITY	PROBABILITY	.05 LIMIT	.95 LIMIT
182000.	196000.	.002	230000.
157000.	166000.	.005	193000.
140000.	146000.	.010	169000.
124000.	127000.	.020	146000.
108000.	110000.	.040	125000.
88600.	89600.	.100	99700.
74300.	74700.	.200	81800.
54500.	54500.	.500	54500.

•	41300.	41100.	•	.800	•	44900.	37400.	•
•	36200.	35900.	•	.900	•	39700.	32300.	•
•	32000.	32300.	•	.950	•	30100.	28700.	•
•	27300.	26700.	•	.990	•	30800.	23400.	•

FREQUENCY CURVE STATISTICS		STATISTICS BASED ON				
•	MEAN LOGARITHM	4.7464	•	SYSTEMATIC DATA	58	•
•	STANDARD DEVIATION	.1528	•	HISTORIC EVENTS	0	•
•	COMPUTED SKEW	.0250	•	HIGH OUTLIERS	0	•
•	GENERALIZED SKEW	.7000	•	LOW OUTLIERS	0	•
•	ADOPTED SKEW	.4000	•	ZERO OR MISSING	0	•
•			•	TOTAL PERIOD, YEARS	58	•

PRELIMINARY RESULTS
 -FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COHOES, N.Y.
 BASED ON COMPUTED VALUES, FLOW IN CUBIC FEET PER SECOND



LEGEND = U UNOBSERVED VALUE, H HIGH OUTLIER OR HISTORIC VALUE, L L

FINAL RESULTS
 -ANNUAL PEAKS - 01357500 MOHAWK RIVER AT COHOES, N.Y.
DATA ANALYZED.....

MUN	DAY	YEAR	FLOW	RANK	WATER YEAR	FLOW	MEDIAN PLOT POS
0	0	1918	45400.	1	1964	143000.	.0120
0	0	1919	35000.	2	1936	130000.	.0291
0	0	1920	64500.	3	1938	102000.	.0462
0	0	1921	47100.	4	1956	100000.	.0634
0	0	1922	56400.	5	1949	86300.	.0805
0	0	1923	58300.	6	1960	83300.	.0976
0	0	1924	71500.	7	1948	82700.	.1147
0	0	1925	57500.	8	1974	80900.	.1318
0	0	1926	52600.	9	1951	77300.	.1490
0	0	1927	54800.	10	1975	74200.	.1661
0	0	1928	54800.	11	1950	72800.	.1832
0	0	1929	72000.	12	1929	72000.	.2003
0	0	1930	38500.	13	1961	71900.	.2175
0	0	1931	33000.	14	1924	71500.	.2346
0	0	1932	41000.	15	1920	64500.	.2517
0	0	1933	47600.	16	1959	64400.	.2688
0	0	1934	45200.	17	1943	63900.	.2860
0	0	1935	61100.	18	1940	63000.	.3031
0	0	1936	130000.	19	1962	61900.	.3202
0	0	1937	48900.	20	1963	61600.	.3373
0	0	1938	102000.	21	1935	61100.	.3545
0	0	1939	51000.	22	1952	60800.	.3716
0	0	1940	63000.	23	1953	59000.	.3887
0	0	1941	49100.	24	1946	58300.	.4058
0	0	1942	47200.	25	1923	58300.	.4229
0	0	1943	63900.	26	1972	58100.	.4401
0	0	1944	46000.	27	1925	57500.	.4572
0	0	1945	47500.	28	1954	56800.	.4743
0	0	1946	56300.	29	1922	56400.	.4914
0	0	1947	51300.	30	1970	56400.	.5086
0	0	1948	82700.	31	1968	55800.	.5257
0	0	1949	86300.	32	1973	55800.	.5428
0	0	1950	72800.	33	1928	54800.	.5599
0	0	1951	77300.	34	1927	54800.	.5771
0	0	1952	60600.	35	1926	52600.	.5942
0	0	1953	59000.	36	1955	51500.	.6113
0	0	1954	56800.	37	1947	51300.	.6284
0	0	1955	51500.	38	1939	51000.	.6455
0	0	1956	100000.	39	1941	49100.	.6627
0	0	1957	23000.	40	1937	48900.	.6798
0	0	1958	39700.	41	1933	47600.	.6969
0	0	1959	64400.	42	1945	47500.	.7140
0	0	1960	83300.	43	1942	47200.	.7312
0	0	1961	71900.	44	1921	47100.	.7483
0	0	1962	61900.	45	1944	46000.	.7654
0	0	1963	61600.	46	1918	45400.	.7825
0	0	1964	143000.	47	1934	45200.	.7997
0	0	1965	27800.	48	1969	42300.	.8168
0	0	1966	32700.	49	1932	41000.	.8339
0	0	1967	24600.	50	1971	40600.	.8510
0	0	1968	55800.	51	1958	39700.	.8682

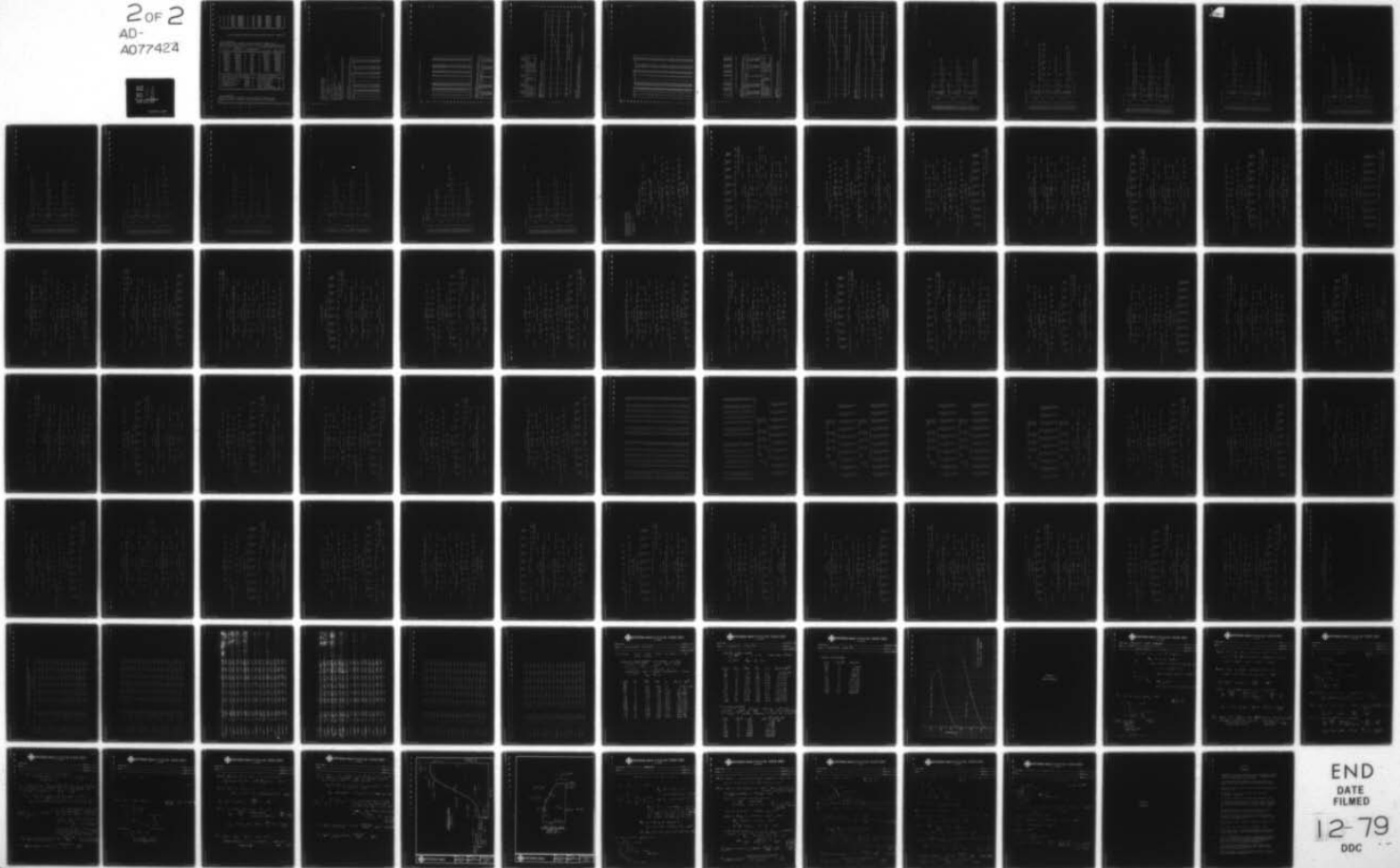
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NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. CRESCENT DAM (INVENTORY NUMBER NY --ETC(U)
SEP 79 J B STETSON DACW51-79-C-0001

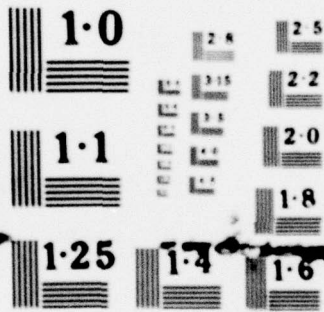
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END
DATE
FILMED
12-79
DDC



NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

0	0	1969	42300.	52	1930	38500.	.8853
0	0	1970	56400.	53	1919	35000.	.9024
0	0	1971	40600.	54	1931	33000.	.9145
0	0	1972	58100.	55	1966	32700.	.9366
0	0	1973	55800.	56	1965	27800.	.9538
0	0	1974	80900.	57	1967	24600.	.9709
0	0	1975	74200.	58	1957	23000.	.9880

1 LOW OUTLIER(S) IDENTIFIED BELOW TEST VALUE OF 23470.4

FINAL RESULTS

-FREQUENCY CURVE - 01357500 MOHAWK RIVER AT COMUES, N.Y.

.....PEAK FLOWS.....		CONFIDENCE LIMITS.....	
COMPUTED	EXPECTED PROBABILITY	EXCEEDANCE PROBABILITY	.05 LIMIT	.95 LIMIT
181000.	146000.	.002	227000.	153000.
156000.	165000.	.005	191000.	134000.
139000.	145000.	.010	166000.	121000.
122000.	126000.	.020	144000.	108000.
107000.	109000.	.040	123000.	95900.
87900.	88800.	.100	98200.	80300.
73900.	74200.	.200	80900.	66400.
54700.	54700.	.500	58800.	50800.
41800.	41800.	.800	45300.	38000.
36600.	36500.	.900	40100.	32800.
32800.	32500.	.950	36300.	28900.
0.	0.	.990	0.	0.

FREQUENCY CURVE STATISTICS

STATISTICS BASED ON

MEAN LOGARITHM	4.7531	SYSTEMATIC DATA	57
STANDARD DEVIATION	.1452	HISTORIC EVENTS	0
COMPUTED SKEW	.2299	HIGH OUTLIERS	0
GENERALIZED SKEW	.7000	LOW OUTLIERS	1
ADOPTED SKEW	.5000	ZERO OR MISSING	0
		TOTAL PERIOD, YEARS	58

FINAL RESULTS

-FREQUENCY PLOT - 01357500 MOHAWK RIVER AT COMUES, N.Y.
BASED ON COMPUTED VALUES, FLOW IN CUBIC FEET PER SECOND

200000.....
: : : : : :


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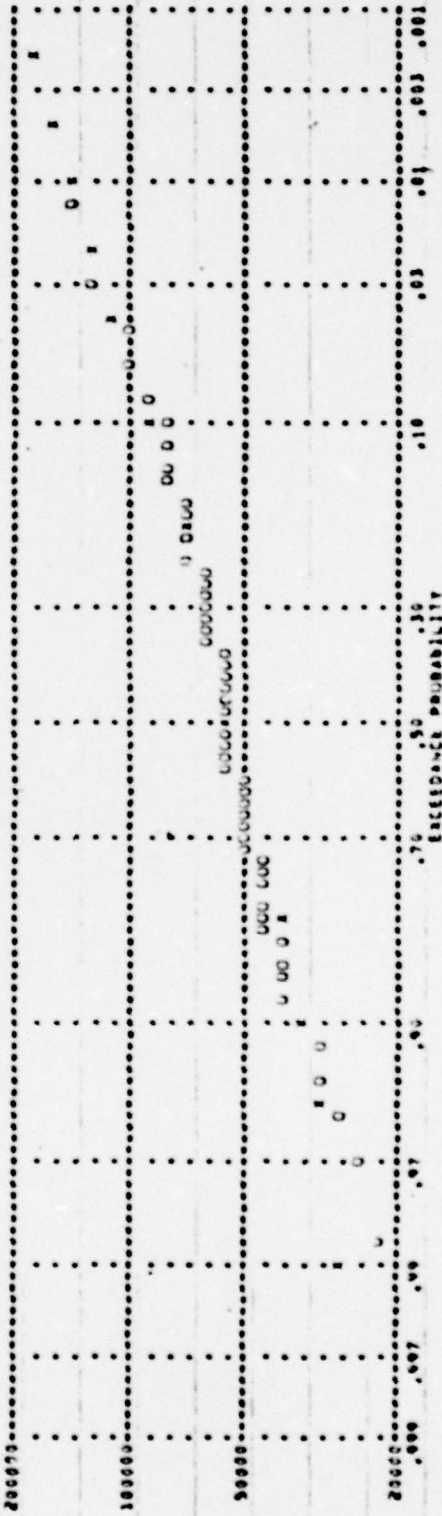
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05000. 05000. 0.000 0.00000 40300.
07000. 07000. 0.000 0.00000 41900.
.....
FREQUENCY CURVE STATISTICS 0 STATISTICS BASED ON
.....
MEAN 0.000000 0.7000 0 SYSTEMATIC DATA 50
STANDARD DEVIATION 0.1000 0 HISTORIC EVENTS 0
COMPUTED SKEW 0.0000 0 HIGH OUTLIER 0
GENERALIZED SKEW 0.0000 0 LOW OUTLIER 0
ADJUSTED SKEW 0.0000 0 ZERO OR MISSING 0
TOTAL PERIOD 0.7000 0
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PRELIMINARY RESULTS
FREQUENCY PLOT - 01157500 NUMBER GIVEN AT COMES, N.Y.
BASED ON COMPUTED VALUES. PLUM IN CUBIC FEET PER SECOND
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LEGEND - LOWEST VALUE, HISTORIC OUTLIER OR HISTORIC VALUE, LOW OUTLIER, RECOMPUTED CURVE

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FINAL RESULTS
ANNUAL PEAKS - 01157500 NUMBER GIVEN AT COMES, N.Y.
.....
DATA ANALYZED.....
.....

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MOY	JOUR	YEAR	PLUM	BASE	YEAR	PLUM	FLC	MEDIAN
0	0	1919	85000	1	1920	100000	.0129	
0	0	1919	35000	2	1920	130000	.0291	
0	0	1920	60000	3	1920	100000	.0082	
0	0	1921	47100	4	1920	100000	.0034	
0	0	1922	56000	5	1920	80000	.0055	
0	0	1923	50000	6	1920	80000	.0079	
0	0	1924	71000	7	1920	60000	.1187	
0	0	1925	57500	8	1920	80000	.1316	
0	0	1926	52000	9	1920	90000	.1099	
0	0	1927	50000	10	1920	70000	.1061	
0	0	1928	54000	11	1920	70000	.1032	
0	0	1929	74000	12	1920	70000	.2053	
0	0	1930	36500	13	1920	70000	.2175	
0	0	1931	33000	14	1920	70000	.2309	
0	0	1932	61000	15	1920	80000	.2517	
0	0	1933	67000	16	1920	80000	.2089	
0	0	1934	69000	17	1920	80000	.2002	
0	0	1935	81000	18	1920	80000	.3031	
0	0	1936	130000	19	1920	80000	.2872	
0	0	1937	60000	20	1920	80000	.3373	
0	0	1938	100000	21	1920	80000	.3565	
0	0	1939	51000	22	1920	80000	.3716	
0	0	1940	63000	23	1920	80000	.3087	
0	0	1941	61000	24	1920	80000	.0058	
0	0	1942	67000	25	1920	80000	.0270	
0	0	1943	60000	26	1920	80000	.0401	
0	0	1944	60000	27	1920	80000	.0572	
0	0	1945	67000	28	1920	80000	.0743	
0	0	1946	51000	29	1920	80000	.0914	
0	0	1947	51000	30	1920	80000	.0096	
0	0	1948	62000	31	1920	80000	.0297	
0	0	1949	60000	32	1920	80000	.0200	
0	0	1950	72000	33	1920	80000	.0509	
0	0	1951	77000	34	1920	80000	.0371	
0	0	1952	60000	35	1920	80000	.0942	
0	0	1953	50000	36	1920	80000	.0113	
0	0	1954	50000	37	1920	80000	.0200	
0	0	1955	51000	38	1920	80000	.0055	
0	0	1956	100000	39	1920	80000	.0927	
0	0	1957	20000	40	1920	80000	.0766	
0	0	1958	36700	41	1920	80000	.0900	
0	0	1959	66000	42	1920	80000	.7103	
0	0	1960	63000	43	1920	80000	.7012	
0	0	1961	71000	44	1920	80000	.7083	
0	0	1962	61000	45	1920	80000	.0000	
0	0	1963	61000	46	1920	80000	.7654	
0	0	1964	100000	47	1920	80000	.7425	
0	0	1965	27000	48	1920	80000	.7907	
0	0	1966	27000	49	1920	80000	.0108	
0	0	1967	60000	50	1920	80000	.0339	
0	0	1968	59000	51	1920	80000	.0510	
0	0	1969	59000	52	1920	80000	.0642	

```

0 0 1000 22370. 0 52 1030 10500. 0053
0 0 1070 50000. 0 53 1010 35000. 0022
0 0 1071 40000. 0 54 1031 33000. 0195
0 0 1072 50130. 0 55 1006 34700. 0100
0 0 1073 53000. 0 56 1065 27000. 0530
0 0 1074 80000. 0 57 1067 20000. 0700
0 0 1075 74200. 0 50 1057 23000. 0080

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1 LOW CONFIDENCE IDENTIFIED BELOW TEST VALUE OF 28070.0

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FINAL RESULTS
FREQUENCY CURVE 01357500 CHANGE GIVEN AT CURVES, MAY.
.....PLAD PLUG.....
.....COMBINED .....
.....CONFIDENCE LIMITS.....
COMPUTED PROBABILITY & PROBABILITY * .05 LIMIT .05 LIMIT
101000 190000 0.002 227000 153000
150000 105000 0.005 191000 130000
130000 120000 0.010 100000 121000
140000 140000 0.020 100000 100000
107000 140000 0.040 123000 95000
079000 080000 0.100 062000 81000
73000 74200 0.200 03900 90000
54700 54700 0.500 50000 52000
01000 01000 0.000 033000 30000
30000 30500 0.050 01100 20000
34000 34500 0.090 000 0
0.
FREQUENCY CURVE STATISTICS * STATISTICS BASED ON
MEAN LOGARITHM 0.7931 * SYSTEMATIC DATA 57
STANDARD DEVIATION 0.1052 * HISTORIC EVENTS 0
COMPUTED SKEW 0.2000 * HIGH UTILITIES 0
UNBALANCED SKEW 0.7000 * LOW UTILITIES 1
ADJUSTED SKEW 0.5000 * ZERO UP -ISSUING 0
TOTAL PERIOD 1489 50

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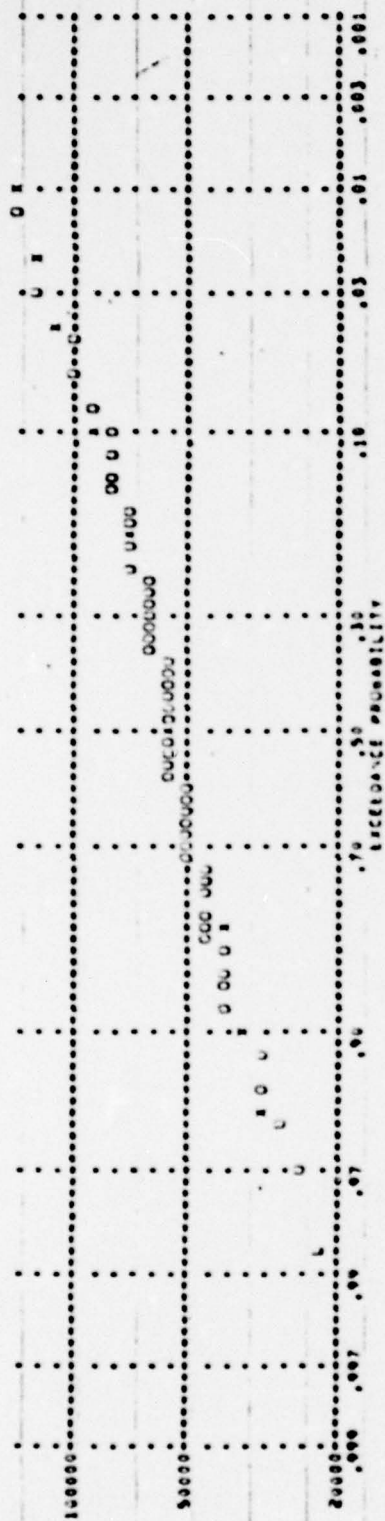
$M/S_{1.2} = 4.75 - 75 \log C = 2.65$
 $3456 = 2.10$

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FINAL RESULTS
FREQUENCY CURVE 01357500 CHANGE GIVEN AT CURVES, MAY.
BASED ON COMPUTED VALUES, PLUG IN CURVE FEET PER SECOND
200000

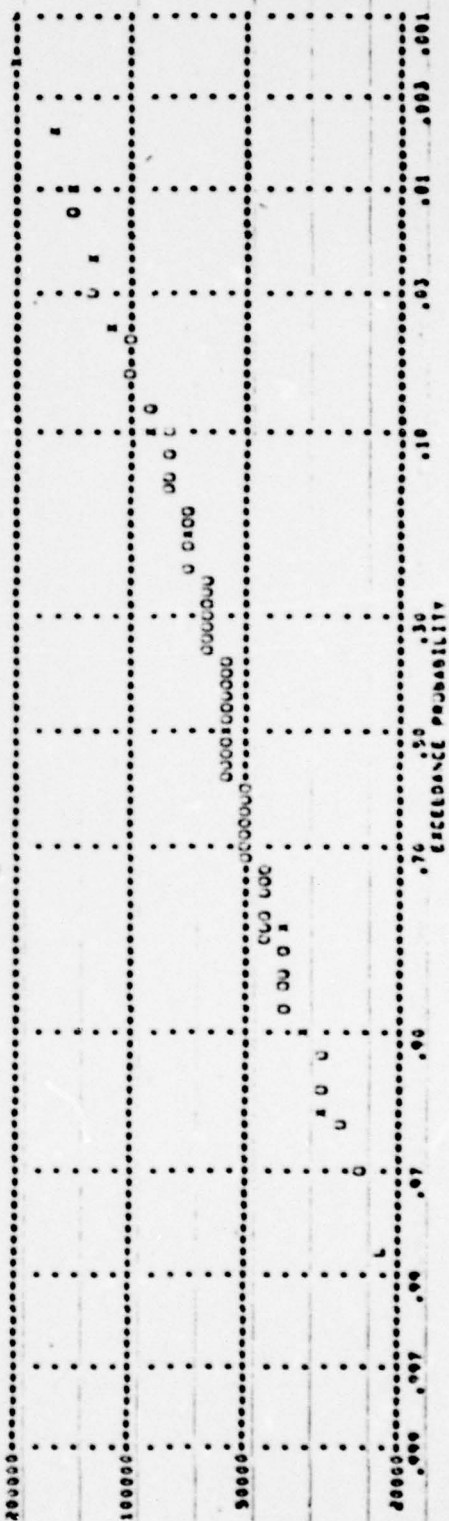
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MB



4 LEGEND - UNOBSERVED VALUE, MARGIN OUTLIER OR HISTORIC VALUE, LOG-O OUTLIER, RECOMPUTED CURVE

FINAL RESULTS
 FREQUENCY PLOT - 0137500 NUMBER GIVEN AT CONCES. N.Y.
 BASED ON EXPECTED PROBABILITY ADJUST-ENT, FLOW IN CUBIC FEET PER SECOND



(0039)	KT	7	7	3456	C	3456	C	79.0	C	1
(0040)	P	1	C	209	C	62.5	73.5	79.0	C	1
(0041)	F	C	21.9	37.5	52.0	62.5	73.5	79.0	C	1
(0042)	T	.125	2.0	1.0						
(0043)	V	17.65	8.14							
(0044)	X	56	4100	1.3						
(0045)	K	2	1003	C	C	C	C	C	C	1
(0046)	KT	8	COMBINE 2 HYDROGRAPHS FOR POMARK RIVER AT ORISKANY							
(0047)	K	1	1004	C	C	C	C	C	C	1
(0048)	KT	9	CHANNEL ROUTE - POMARK RIVER TO UTICA							
(0049)	V	C	C	C	C	C	C	C	C	1
(0050)	YI	1	C	2	-2					
(0051)	K	6	C	C	C	C	C	C	C	1
(0052)	KT	10	SUB AREA-4 RUNOFF							
(0053)	P	1	C	53	52.0	62.5	73.5	79.0	C	1
(0054)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	C	1
(0055)	T	.125	2.0	1.0						
(0056)	V	13.44	6.96							
(0057)	A	140	1100	1.3						
(0058)	K	2	1004	C	C	C	C	C	C	1
(0059)	KT	11	COMBINE 2 HYDROGRAPHS FOR POMARK RIVER AT UTICA							
(0060)	K	1	1005	C	C	C	C	C	C	1
(0061)	KT	12	CHANNEL ROUTE - POMARK RIVER TO ILLION							
(0062)	V	C	C	C	C	C	C	C	C	1
(0063)	YI	2	C	C	2.45	-2				
(0064)	K	5	C	C	C	C	C	C	C	1
(0065)	KT	13	SUB AREA-5 RUNOFF							
(0066)	P	1	C	158	3456	C	C	C	C	1
(0067)	F	C	21.9	37.5	52.0	62.5	73.5	79.0	C	1
(0068)	T	.10	2.00	1.0						
(0069)	V	15.65	8.17							
(0070)	A	262	2100	1.3						
(0071)	K	2	1005	C	C	C	C	C	C	1
(0072)	KT	14	COMBINE 2 HYDROGRAPHS FOR POMARK RIVER AT ILLION							
(0073)	K	1	1010	C	C	C	C	C	C	1
(0074)	KT	15	CHANNEL ACUTE - POMARK RIVER BELOW W. CANADA CREEK							
(0075)	V	C	C	C	C	C	C	C	C	1
(0076)	YI	1	C	1.5	-2					

AT MCHANE RIVER BASIN

(0077)	K	0	6	0	0	C	0	0	1	
(0078)	K1	16	SUB AREA-6 RUNOFF	0	0	3456	0	0	C	1
(0079)	M	1	37.5	52.0	62.5	73.5	79.0			
(0080)	P	0	21.9	37.5	52.0	62.5	73.5	79.0		
(0081)	T	.075	1.0							
(0082)	V	22.55	15.88							
(0083)	A	725	5700	1.3						
(0084)	K	1	1006	0	0	0	0	0	1	
(0085)	K1	17	CHANNEL ROUTE - W. CANADA CREEK BELOW MINCKLEY RESERVOIR (USGS 3440)	0	0	0	0	0	0	1
(0086)	V	0	0	0	0	0	0	0	0	1
(0087)	V1	0	0	0	0	0	0	0	0	157900
(0088)	V2	5370	6400	124710	157900	161100	164540	167750	170940	174400
(0089)	V3	0	0	0	0	474	1340	2462	3790	5297
(0090)	K	0	7	0	0	0	0	0	0	1
(0091)	K1	18	SUB AREA-7 RUNOFF	0	0	0	0	0	0	1
(0092)	P	1	0	0	0	3456	0	0	0	1
(0093)	F	0	21.9	37.5	52.0	62.5	73.5	79.0		
(0094)	T	.075	1.0							
(0095)	V	7.32	4.91							
(0096)	X	2	50	1.3						
(0097)	K	2	1007	0	0	0	0	0	0	1
(0098)	K1	19	COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT TRENTON	0	0	0	0	0	0	1
(0099)	V	0	0	0	0	0	0	0	0	1
(0100)	K1	20	SUB AREA-8 RUNOFF	0	0	3456	0	0	0	1
(0101)	P	1	53	52.0	62.5	73.5	79.0			
(0102)	F	0	21.9	37.5	52.0	62.5	73.5	79.0		
(0103)	T	.075	1.0							
(0104)	V	11.62	6.25							
(0105)	X	72	550	1.3						
(0106)	K	2	1008	0	0	0	0	0	0	1
(0107)	K1	21	COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK BELOW CINCINNATI CREEK	0	0	0	0	0	0	1
(0108)	K	1	1009	0	0	0	0	0	0	1
(0109)	K1	22	CHANNEL ROUTE - W. CANADA CREEK TO EAST BRIDGE (USGS 3440)	0	0	0	0	0	0	1
(0110)	V	0	0	0	0	0	0	0	0	1
(0111)	V1	4	0	0	0	0	0	0	0	1
(0112)	K	0	0	1.08	0	0	0	0	0	1
(0113)	K1	23	SUB AREA-9 RUNOFF	0	0	0	0	0	0	1
(0114)	P	1	0	121	0	3456	0	0	0	1

AT POMARK RIVER BASIN

STATION	DATE	TIME	21.9	37.5	52.0	62.5	73.5	79.5	REMARKS
(C1315)	F	0	21.9	37.5	52.0	62.5	73.5	79.5	
(C1316)	F	0.075	1.0	1.0					
(C1317)	V	14.17	7.0						
(C1318)	X	190	1450	1.3					
(C1319)	K	2	1005						
(C1320)	KT	24	COMBINE 2 HYDROGRAPHS FOR N. CANADA CREEK AT EAST BRIDGE (USGS 3460)						
(C1321)	K	1	1010						
(C1322)	KT	25	CHANNEL ROUTE - W. CANADA CREEK TO POMARK RIVER						
(C1323)	V	0	0	0	0	0	0	0	
(C1324)	V	1	0	0	0.72	-3			
(C1325)	K	0	10	0					
(C1326)	KT	26	SUB AREA-10 RUNOFF						
(C1327)	M	1	0	0	0	3456	0	0	
(C1328)	F	0	21.9	37.5	52.0	62.5	73.5	79.5	
(C1329)	F	0.075	2.0	1.0					
(C1330)	V	11.33	6.41						
(C1331)	A	60	500	1.3					
(C1332)	K	3	1010	0					
(C1333)	KT	27	COMBINE 3 HYDROGRAPHS AT POMARK RIVER BELOW N. CANADA CREEK						
(C1334)	K	1	1011						
(C1335)	KT	28	CHANNEL ROUTE - POMARK RIVER AT LITTLE FALLS						
(C1336)	V	0	0	0	0	0	0	0	
(C1337)	V	1	0	0	2.1	-2			
(C1338)	M	0	11	0	0	0	0	0	
(C1339)	KT	29	SUB AREA-11 RUNOFF						
(C1340)	M	1	0	27	0	3456	0	0	
(C1341)	F	0	21.9	37.5	52.0	62.5	73.5	79.5	
(C1342)	F	0.075	1.0	1.0					
(C1343)	V	5.63	5.63						
(C1344)	X	52	220	1.3					
(C1345)	K	2	1011	0					
(C1346)	KT	30	COMBINE 2 HYDROGRAPHS AT POMARK RIVER IN LITTLE FALLS						
(C1347)	K	1	1012	0	0	0	0	0	
(C1348)	KT	31	CHANNEL ROUTE - POMARK RIVER AT LITTLE FALLS (USGS 3470)						
(C1349)	V	0	0	0	0	0	0	0	
(C1350)	V	1	0	0	1.7	-2			
(C1351)	K	0	12	0	0	0	0	0	
(C1352)	KT	32	SUB AREA-12 RUNOFF						

AT MOHAWK RIVER BASIN

Code	Category	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6	Value 7	Value 8	Value 9	Value 10
(C153)	F	1	C	23	C	3454	D	73.5	C	79.C	1
(C154)	F	2	21.9	37.5	52.C	62.5	73.5	79.C	C		
(C155)	F	.075	1.C	1.0							
(C156)	V	9.45	5.54								
(C157)	X	22	250	1.5							
(C158)	K	2	1012		C						1
(C159)	KT	33	COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER IN LITTLE FALLS (USGS 3470)								
(C160)	K	1	1015		C						1
(C161)	K	34	CHANNEL ROUTE - MOHAWK RIVER BELOW E. CANADA CREEK								
(C162)	V	C	C		C						
(C163)	V	1	C		.5						
(C164)	K	C	13		D						1
(C165)	KT	35	SUB AREA-13 RUNOFF								
(C166)	M	1	C	261	C	3456	C		C		1
(C167)	F	C	29.1	37.5	52.0	62.5	73.5	79.C	C		
(C168)	T	.075	1.0	1.0							
(C169)	V	17.09	7.68								
(C170)	X	480	3650	1.5							
(C171)	K	C	14		C						1
(C172)	KT	36	SUB AREA-14 RUNOFF								
(C173)	M	1	C	30	C	3456	C		C		1
(C174)	F	C	21.9	37.5	52.0	62.5	73.5	79.C	C		
(C175)	T	.075	1.C	1.0							
(C176)	V	10.04	5.64								
(C177)	X	37	320	1.3							
(C178)	K	2	1014		C						1
(C179)	KT	37	COMBINE 2 HYDROGRAPHS AT E. CANADA CREEK AT EAST CREEK (USGS 3480)								
(C180)	K	1	1014		C						1
(C181)	KT	38	CHANNEL ROUTE - E. CANADA CREEK TO EAST CREEK (USGS 3460)								
(C182)	V	C	C		C						
(C183)	V	1	C		14						
(C184)	K	1	1015		C						1
(C185)	KT	39	CHANNEL ROUTE - MOHAWK RIVER BELOW E. CANADA CREEK								
(C186)	V	C	C		C						
(C187)	V	1	C		1						
(C188)	V	1	C		1.0						
(C189)	K	C	15		C						1
(C190)	KT	40	SUB AREA-15 RUNOFF								
(C191)	M	1	C	37	C	3456	C		C		1

A1 MOHAWK RIVER BASIN

Station	Code	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6	Value 7	Value 8
(C193)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	
(C192)	T	.075	1.0						
(C193)	V	10.42	5.86						
(C194)	A	44	400	1.3					
(C195)	K	3	1015						
(C196)	K1	41	COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW E. CANADA CREEK						
(C197)	K	1	1016						
(C198)	K1	42	CHANNEL ROUTE - MOHAWK RIVER BELOW CAROGA CREEK						
(C199)	T	0	0	0	0	0	0	0	0
(C200)	V1	1	0	0	0	0	0	0	0
(C201)	K	0	10	0	0	0	0	0	0
(C202)	K1	43	SUB AREA-16 RUNOFF						
(C203)	M	1	0	151	0	3456	0	0	0
(C204)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	0
(C205)	T	.075	1.0						
(C206)	V	18.56	17.91						
(C207)	A	29L	3500	1.3					
(C208)	K	2	1016						
(C209)	K1	44	COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELOW CAROGA CREEK						
(C210)	K	1	1012						
(C211)	K1	45	CHANNEL ROUTE - MOHAWK RIVER BELOW OTSOUAGO CREEK						
(C212)	V	0	0	0	0	0	0	0	0
(C213)	V1	1	0	0	0	0	0	0	0
(C214)	K	0	17	0	0	0	0	0	0
(C215)	K1	46	SUB AREA-17 RUNOFF						
(C216)	M	1	0	59.2	0	3456	0	0	0
(C217)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	0
(C218)	T	.075	1.0						
(C219)	V	11.88	6.66						
(C220)	A	52	400	1.3					
(C221)	K	0	18						
(C222)	K1	47	SUB AREA-18 RUNOFF						
(C223)	M	1	0	13.1	0	3456	0	0	0
(C224)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	0
(C225)	T	.075	1.0						
(C226)	V	8.42	5.42						
(C227)	A	14	100	1.3					
(C228)	K	3	1016						

31 MOHAWK RIVER BASIN

(0229)	K1	48 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW CTSUAGO CREEK							
(0230)	K	1019	C	C	C				
(0231)	K1	49 CHANNEL ROUTE-MOHAWK RIVER BELOW CANAJOHARIE CREEK							
(0232)	Y		C	1					
(0233)	Y1		C	1-2	-2				
(0234)	K	19	C	C	C				
(0235)	K1	50 SUB AREA - 19 RUNOFF							
(0236)	Y		C	72	3456	C	C		1
(0237)	F		C	37.5	52.0	62.5	73.5	79.0	
(0238)	T	.075	1.0	1.0					
(0239)	V	14.44	6.41						
(0240)	X	103	700	1.3					
(0241)	K	2	1019	0	C	C			
(0242)	K1	51 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELOW CANAJOHARIE CREEK							
(0243)	K	1	1020	C	C				
(0244)	K1	52 CHANNEL ROUTE - MOHAWK RIVER AT SPRAYERS							
(0245)	Y		C	C	1				
(0246)	Y1		C	1-2	-2				
(0247)	K	20	C	C	C				
(0248)	K1	53 SUB AREA-20 RUNOFF							
(0249)	Y		C	55	3456	62.5	73.5	79.0	1
(0250)	F		C	21.5	37.5	52.0	62.5	73.5	
(0251)	T	.075	1.0	1.0					
(0252)	V	11.78	6.38						
(0253)	X	75	550	1.3					
(0254)	K	2	1020	C	C	C			
(0255)	K1	54 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT SPRAYERS							
(0256)	K	1	1023	C	C	C			
(0257)	K1	55 CHANNEL ROUTE - MOHAWK RIVER BELOW CATALUTTA CREEK							
(0258)	Y		C	C	1				
(0259)	Y1		C	1-35	-2				
(0260)	K	21	C	C	C				
(0261)	K1	56 SUB AREA-21 RUNOFF							
(0262)	Y		C	12.7	3456	62.5	73.5	79.0	1
(0263)	F		C	21.5	37.5	52.0	62.5	73.5	
(0264)	T	.075	1.3	1.0					
(0265)	V	8.61	6.32						
(0266)	X	13	140	1.3					

AT MCFARLANE RIVER BASIN

(0303)	K1	65	SUB AREA-25						
(0304)	M	1	C	186.5	0	3465	C	C	1
(0307)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	
(0308)	T	.075	2.0	1.0					
(0309)	V	16.24	8.22						
(0310)	K	320	2500	1.3					
(0311)	K	2	1025	0	0	0	0	1	
(0312)	K1	66	COMBINE HYDROGRAPHS AT CATAVIA KILL AT WINDHAP						
(0313)	K	4	46	L	L	L	L	1	
(0314)	K1	47	SUB AREA-26						
(0315)	M	1	C	10.2	0	3456	0	C	1
(0316)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	
(0317)	T	.075	1.5	1.0					
(0318)	V	7.05	4.73						
(0319)	X	10	70	1.5					
(0320)	K	2	1026	0	0	0	0	1	
(0343)	K1	68	COMBINE 2 HYDROGRAPHS AT SCHWARTZ CREEK AT FRATTSVILLE (USGS 3500)						
(0344)	K	0	127	C	C	C	C	1	
(0345)	K1	69	SUB AREA-127 RUNOFF						
(0346)	K	1	0	78	0	3456	0	C	1
(0347)	F	0	21.9	37.5	52.0	62.5	73.5	79.0	
(0348)	T	.075	1.5	1.0					
(0349)	V	12.90	0.94						
(0350)	K	115	800	1.5					
(0351)	K	70	COMBINE 2 HYDROGRAPHS AT SCHWARTZ RESERVOIR AT GILBOA DAM						
(0352)	K1	70(A)	ROUTE OVER GILBOA DAM						
(0353)	F	0	0	0	0	0	0	1	
(0354)	V1	1	0	0	0	0	0	0	1
(0355)	V2	15350	30200	49120	66600	61750	62840	63920	65010
(0356)	V3	0	0	0	0	0	0	0	0
(0357)	K	1	3447	0	0	0	0	0	0
(0358)	K1	71	CHANNEL ROUTE - SCHWARTZ CREEK BELOW COLLESPILL CREEK						
(0359)	F	0	0	0	0	0	0	0	0
(0360)	V1	4	0	0	1.4	.2			
(0361)	V2	47	0	0	0	0	0	0	0
(0362)	K1	72	SUB AREA-27 RUNOFF						

STATION	TYPE	DESCRIPTION	COORDINATE	DATE	STATUS
0381	K1	81 SUB AREA-30 RUNOFF			
0382	R	1	103	C	3450
0383	F	41.7	37.5	52.0	62.5
0384	T	.075	1.0		73.5
0385	V	13.01	11.14		79.0
0386	A	160	1150		
0387	K	2	1050	C	
0388	K1	82 COMBINE 2 HYDROGRAPHS AT POMOK RIVER AT AMSTERDAM			
0389	F	1	1031	C	
0390	K1	83 CHANNEL ROUTE - POMOK RIVER AT CHANESVILLE			
0391	F	1	0	C	
0392	T	1	0	1.3	-2
0393	K	31		C	
0394	K1	84 SUB AREA-31 RUNOFF			
0395	F	1	40	C	3450
0396	F	21.9	37.5	52.0	62.5
0397	T	.075	1.0		73.5
0398	V	9.50	5.79		79.0
0399	K	34	100		
0400	K	2	1031	C	
0401	K1	85 COMBINE 4 HYDROGRAPHS AT POMOK RIVER AT CHANESVILLE			
0402	F	1	1032	C	
0403	K1	86 CHANNEL ROUTE - POMOK RIVER AT ROTTERDAM JUNCTION			
0404	F	1	0	C	
0405	T	1	0	2.1	-2
0406	K	32		C	
0407	K1	87 SUB AREA-32 RUNOFF			
0408	F	1	32	C	3450
0409	F	41.9	37.5	52.0	62.5
0410	T	.075	1.0		73.5
0411	V	11.09	10.19		79.0
0412	A	40	350		
0413	K	2	1032	C	
0414	K1	88 COMBINE 2 HYDROGRAPHS AT POMOK RIVER AT ROTTERDAM JUNCTION			
0415	F	1	1033	C	
0416	K1	89 CHANNEL ROUTE - POMOK RIVER AT SCHRECTADY			
0417	F	1	0	C	
0418	T	2	0	1.5	-2

AT POMAHK RIVER BASIN

Code	Description	Value	Unit	Value	Unit	Value	Unit
(CC01)	AT POMAHK RIVER BASIN						
(CC02)	A2 MEC-10E						
(CC03)	A3 HYDROLOGIC MODEL (CLEAR COEFFICIENT)						
(CC04)	E 150						
(CC05)	B1						
(CC06)	J 1						
(CC07)	J1 -2						
(CC08)	C 1						
(CC09)	A 1 SUB AREA-1 ABOVE DELTA RESERVOIR RUNOFF						
(CC10)	F 1						
(CC11)	F 2						
(CC12)	T 1						
(CC13)	V 14.97						
(CC14)	A 250						
(CC15)	A 1001						
(CC16)	A1 2 ROUTE OVER DELTA DAM (USGS 3360)						
(CC17)	V 1						
(CC18)	V 1						
(CC19)	Y2 38500						
(CC20)	Y3 0						
(CC21)	A 1 1042						
(CC22)	A1 3 CHANNEL ROUTE - POMAHK RIVER TO ROPE ABOVE BARGE CANAL						
(CC23)	V 1						
(CC24)	V 1						
(CC25)	E 2						
(CC26)	A1 4 SUB AREA-2 RUNOFF						
(CC27)	F 1						
(CC28)	F 2						
(CC29)	T 1						
(CC30)	V 6.95						
(CC31)	A 7 50						
(CC32)	K 2 1002						
(CC33)	A1 5 COMBINING 2 HYDROGRAPHS FOR POMAHK RIVER AT ROPE						
(CC34)	F 1 1003						
(CC35)	A1 6 CHANNEL ROUTE - POMAHK RIVER TO ORISKANY						
(CC36)	V 1						
(CC37)	V 2						
(CC38)	E 3						

21500 76770
4957 10666

69900 3771
21500 4957

62350 68750
2698 1753

3455 73.5
62.5 79.0

3455 73.5
62.5 79.0

1.0 1.0
1.0 1.0

A1 MOHAWK RIVER BASIN

STATION	DATE	TIME	TYPE	NO	SUB	AREA	SS	C	RUNOFF	C	C	C	C	C	C	C	C	C	C
(0419)	K			90	SUB	AREA-33													
(0420)	RT																		
(0421)	F																		
(0422)	F																		
(0423)	T																		
(0424)	V																		
(0425)	X																		
(0426)	Z																		
(0427)	K																		
(0428)	K																		
(0429)	RT																		
(0430)	T																		
(0431)	VI																		
(0432)	K																		
(0433)	RT																		
(0434)	P																		
(0435)	P																		
(0436)	T																		
(0437)	V																		
(0438)	A																		
(0439)	K																		
(0440)	RT																		
(0441)	K																		
(0442)	RT																		
(0443)	V																		
(0444)	VI																		
(0445)	K																		
(0446)	RT																		
(0447)	V																		
(0448)	F																		
(0449)	T																		
(0450)	V																		
(0451)	X																		
(0452)	K																		
(0453)	RT																		
(0454)	F																		
(0455)	A																		
(0456)	A																		

97 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT CONCES (USGS 3575)

.....
 FLOOD HYDROGRAPH PACKAGE (REC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 26 FEB 79

RUN DATE/TIME: AUG 10 1979
 TIME: 11:48:04

MONAWA RIVER BASIN
 REC-104
 HYDROLOGIC MODEL (CLARR COEFFICIENT)

JOB SPECIFICATION									
NO	NMR	NPIN	IDAY	IMR	IPIN	METRC	IFLT	IFPT	INSTAN
150	1	0	0	0	0	0	0	0	0
			JCEP	NWT	LRGPT	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED
 MPLAN= 1 NWTIG= 6 LPTIO= 1
 WTIG= 0.20 C.40 0.50 0.60 C.80 1.00

.....

SUB-AREA RUNOFF COMPUTATION

1 SUB AREA-1 ABOVE DELTA RESERVOIR RUNOFF
 ISTAT ICCPP ICECON ITAPE JPLT JFPT IMAPE ISTAGE I AUTO
 1 0 0 0 0 0 0 1 1 0 0 0

HYDROGRAPH DATA									
INSDU	TUNG	TAMEA	SNAF	TRSDA	TRSEC	RATIC	ISNOW	ISAME	LOCAL
1	0	150.00	C.00	3456.00	0.00	C.000	C	1	C

PRECIP DATA			
SFPE	PMS	RC	R24
C.00	21.90	37.50	52.00
			62.50
			73.50
			74.00
			R72
			R96
			C.00

TRSEC COMPUTED BY THE PROGRAM IS 0.925

LOSS DATA					
LRPT	STOK	ULTR	RTIOL	EPAIN	STOKS
0	C.07	1.00	1.00	C.00	C.00
					RTIOL
					STIOL
					CNSTL
					ALSPA
					RTIME
					C.00
					C.00
					C.00
					0.00

UNIT HYDROGRAPH DATA
 TC= 14.57 M= 7.29 NTA= C

STATUS: 260.00 RECEPTION DATA 1000.00 DTIMER: 9.10

UNIT HYDROGRAPH 47 END-OF-PERIOD ORIGINATES, LAGR 12.33 HOURS, CP= 0.75 VOL= 1.00

152.	341.	1765.	2446.	3147.	3836.	4552.	5158.	5666.
5899.	6645.	5504.	5565.	4596.	4355.	3796.	3308.	2886.
2513.	1910.	1664.	1451.	1265.	1102.	961.	837.	730.
636.	555.	483.	421.	367.	320.	279.	243.	185.
161.	122.	107.	93.	81.	71.			

MC.DA NR.MN PERIOD MAIN ERCS LOSS COMP G

SUP 16.07 12.00 4.07 1214552.
(408.)(305.)(103.)(34392.25)

.....

HYDROGRAPH ROUTING

2 ROUTE OVER DELTA DAM (USGS 3360)

GLCSS	CLCSS	AVG	IMES	ISAPE	IOFT	IPFP	LSTR
C.O	0.000	0.00	1	1	0	0	C
ROUTING DATA							
LAG	AMSK	A	TSK	STGRA	ISFRAT		
0	0	0.000	0.000	0.000	0.000	62330.	C
.....							
STORAGE	50390.00	62330.00	64170.00	65540.00	66920.00	68750.00	69500.00
OUTFLW	C.OO	C.OO	337.00	454.00	1753.00	2698.00	3771.00
.....							
HYDROGRAPH ROUTING							

.....

3 CHANNEL ROUTE - MCHANE RIVER TO HOPE ABOVE BARGE CANAL

ISTW	ICOP	AVG	IMES	ISAPE	IOFT	IPFP	LSTR
1.22	1	0.000	0	1	0	0	C
ROUTING DATA							
LAG	AMSK	A	TSK	STGRA	ISFRAT		
0	0	1.000	0.300	C.CCO	C.CCO	C.	C.
.....							
HYDROGRAPH ROUTING							

.....

SUB-AREA RUNOFF COMPLETION

4 SUB AREA-2 RUNOFF
 ISTAT ICOMP IECON ISTATE JPLT JFRT INAPE ISTAGE IAUTO
 2 0 0 0 0 0 1 0 C

HYDROGRAPH DATA
 IMYG IUPG TAREA SNAF TRSDA TRSFC BATIC ISNOW ISAPE ILOCAL
 1 0 7.00 0.00 3456.00 0.00 C.000 C 1 C

PRECIP DATA
 SFPE FMS BC RTZ R24 R48 R72 R96
 0.00 21.90 27.50 52.00 62.50 73.50 75.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA
 LROPT STRN OLTRF RTIOL ERAIN STRFS RTIOK STHTL CNSTL ALSPT RTIPE
 0 C.00 2.00 1.00 0.00 0.00 1.00 C.00 C.00 C.00 C.00

UNIT HYDROGRAPH DATA
 TC= 0.55 R= 4.47 NTA= C

RECESSION DATA
 STATQ= 7.00 GRCSN= 50.00 RTIOK= 1.50

UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG= 5.92 HOURS, CP= 0.69 VOL= 1.00
 35. 127. 245. 376. 477. 526. 516. 464. 355. 284.
 227. 181. 145. 92. 74. 59. 47. 38. 30.
 24. 19. 15. 10. 8. 6. 5.

END-OF-PERIOD FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP C PC.DA HR.MN PERIOD RAIN EXCS LOSS COMP C
 SUP 16.07 11.62 4.45 53901.
 (408.)(255.)(113.)(1526.30)

.....

COMBINE HYDROGRAPHS

5 COMBINING 2 HYDROGRAPHS FOR MCHANE RIVER AT ROPE
 ISTAT ICOMP IECON ISTATE JPLT JFRT INAPE ISTAGE IAUTO
 1002 2 0 0 0 0 1 0 C

.....

HYDROGRAPH ROUTING

7 CHANNEL ROUTE - MCHANE RIVER TO ORENSAW

```

ISTAG ICOPP IRECON ITAPE JPLT JFRT INAPE ISTAGE IALTO
1003 0 0 0 0 0 0 0
ROUTING DATA
QLCSS CLCSS AVG IRES ISAPE IOFT IPFP LSTR
0.0 0.000 0.00 0 1 0 0
NSTFS NSTDL LAG AMXK X TSK STORA ISPRAT
2 0 0 1.450 0.300 0.000 0.000 0.000 0.000 0.000

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.....

SUB-AREA RUNOFF COMPUTATION

7 SUB AREA-3 RUNOFF

```

ISTAG ICOPP IRECON ITAPE JPLT JFRT INAPE ISTAGE IALTO
3 0 0 0 0 0 0 0
HYDROGRAPH DATA
INTDG IUPG TABEA SNAF TRSDA TRSFC RATIC ISNOW ISAME LOCAL
1 0 209.00 0.00 3650.00 0.00 0.00 0 1 0

```

PRECIP DATA

```

SPEE PPS RQ R12 R24 R48 P72 R96
C.CC 21.00 37.50 52.00 62.50 73.50 79.00 0.00

```

TRSPC COMPLETED BY THE PROGRAM IS 0.929

LOSS DATA

```

LNOPT STRW DLTRW RTIOL ERAIN STRWS RTIOK STMTL CNSTL ALSM RTIOP
0 C.13 2.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00

```

UNIT HYDROGRAPH DATA

TC= 17.65 R= 8.19 NTA= C

RECESSION DATA

STRIO= 540.00 QRC5M= 4100.00 RTIOB= 1.30

```

UNIT HYDROGRAPH 54 END-OF-PERIOD ORDINATES, LACT 14.43 MOURS, CP= 0.76 VOL= 1.00
205. 700. 1531. 2412. 3359. 4342. 5344. 6351. 7353. 8276.
9019. 9919. 10698. 11609. 12667. 13899. 15283. 16814.
6251. 5552. 4895. 4332. 3833. 3392. 3002. 2656. 2353. 2080.
7843. 7629. 7462. 7376. 7329. 7299. 7284. 7282. 7280.
540. 480. 425. 376. 336. 294. 260. 230. 204. 180.
100. 141. 125. 111.

```

END-OF-PERIOD FLOW
MR.MN PERIOD RAIN EXCS LOSS COMP Q PO.DA MR.MN PERIOD RAIN EXCS LOSS COMP C
SUP 10.07 10.18 3.89 2012222.
(4CR.) (259.) (150.) (56976.72)

.....

COMBINE HYDROGRAPHS

8 COMBINE 2 HYDROGRAPHS FOR MOHAWK RIVER AT CHRISKANY
 ISTAT ICCPP IRECON ITAPE JFLT JFRT INAPE ISTAGE I/UTO
 1003 2 0 0 0 0 0 1 0 0

.....

HYDROGRAPH ROUTING

9 CHANNEL ROUTE - MOHAWK RIVER TO UTICA
 ISTAT ICCPP IRECON ITAPE JFLT JFRT INAPE ISTAGE I/UTO
 1004 1 0 0 0 0 0 1 0 0

ROUTING DATA
 GLOSS CLOSS AVG INES ISAME IOPT IPPP LSTR
 0.0 0.000 0.00 0 1 0 0 0 0

MSFS NSTOL LAG AMSFK X TSK STORA ISPHAT
 1 0 0 2.000 0.200 0.000 0.000 0.000 0.000 0.000 0.000

.....

SUB-AREA RUNOFF COMPUTATION

10 SUB AREA-4 RUNOFF
 ISTAT ICCPP IRECON ITAPE JFLT JFRT INAPE ISTAGE I/UTO
 4 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

HYD04 1 IUNG TAREA SNAF TRSQA TRSFC RATIO ISNOB ISAME LOCAL
 0 93.00 0.00 3456.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000

PRECIP DATA
 SFFE FMS R6 R72 R74 R48 R72 R96
 0.00 21.90 37.50 52.00 42.50 73.50 79.00 79.00 0.00

TRSFIC COMPUTED BY THE PROGRAM IS 0.925

LOSS DATA

LOSS DATA
 L/OFT STRN DLIEN RTIOL ERAIN STRKS RTIOR STATH CNSTL ALSPL RTIPL
 0 0.13 2.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
TC= 14.44 D= A.CP NTR= F

RECESSION DATA
 SINTQ= 140.CC QRC5M= 1100.00 M110R= 1.30

UNIT	HYDROGRAPH	END-OF-PERIOD	LAG	11.23	MCLMS	CP	0.74	VOL	1.00
115.	625.	851.	1333.	1843.	2368.	2893.	3304.	3719.	3948.
4056.	4057.	3914.	3590.	3144.	2743.	2355.	2044.	1771.	1534.
1347.	1151.	997.	864.	748.	648.	562.	487.	422.	365.
316.	274.	237.	204.	178.	154.	134.	116.	100.	87.
75.	65.	57.	49.	42.					

END-OF-PERIOD FLOW
 MG.DA MR.MM PERIOD RAIN EXCS LOSS PC.DA MR.MM PERIOD RAIN EXCS LOSS COMP C
 SUM 16.07 10.18 5.89 642854.
 (408.)(259.)(150.)(18203.5P)

.....

COMBINE HYDROGRAPHS

11 COMBINE 2 HYDROGRAPHS FROM MOHAWK RIVER AT UTICA
 ISTAT ICOPP IECON ITAPE JFLT JFRT INAPE ISTAGE I-AUTO
 1004 2 0 0 0 0 0 1 0 0

.....

HYDROGRAPH ROUTING

12 CHANNEL ROUTE - MOHAWK RIVER TO ILLION
 ISTAT ICOPP IECON ITAPE JFLT JFRT INAPE ISTAGE I-AUTO
 1005 1 0 0 0 0 0 1 0 0
 ROUTING DATA
 LOSS CLOSS AVG IRES ISAME IOFT IIPP LSTW
 C.O 0.000 0.00 0 0 0 0 0
 NSTPS NSIDL LAG AMSKE X TSK STORA ISFRAT
 2 0 2.450 0.000 0.000 C.

.....

SUB-AREA RUNOFF COMPLETION

13 SUB AREA-3 RUNOFF
 ISTAT ICOPP IECON ITAPE JFLT JFRT INAPE ISTAGE I-AUTO
 5 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

IRYOG 1 IUPG C TANEA 3450.00 TRSDA 158.00 TRSFC 0.00 ISNOW 0 ISAME 1 LOCAL C
 SFPE 21.90 PMS 37.50 RC 52.00 R12 62.50 R24 73.50 R48 75.00 R72 76.00 R96 77.00
 TRSFC COMPUTED BY THE PROGRAM IS 0.877

PRECIP DATA
 LOSS DATA
 UNIT HYDROGRAPH DATA
 TC= 15.69 R= 8.17 NTA= C
 REcession DATA
 STR16= 265.00 QRC5N= 2100.00 RT10R= 1.50

UNIT HYDROGRAPH 52 END-OF-PERIOD ORDINATES, LAG= 13.21 HOURS, CP= 0.75 VOL= 1.00
 134. 497. 1000. 1577. 2195. 2838. 3492. 4149. 4757. 5245.
 5596. 5817. 5915. 5887. 5721. 5355. 4814. 4259. 3768. 3333.
 2947. 2608. 2308. 2041. 1806. 1598. 1413. 1250. 1106. 979.
 860. 678. 599. 530. 469. 367. 287. 225. 195. 156. 122. 95. 84.
 73. 66.

END-OF-PERIOD FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LCSS COMP G MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
 SUP 15.18 10.08 5.10 1085146.
 (386.) (256.) (130.) (30727.8E)

14 COMBINE 2 HYDROGRAPHS FOR MOHAWK RIVER AT ILLICN
 ISTAT ICOPP IECON ITAFE JPLY JFRT INAPE ISTAGE I AUTO
 0 0 0 0 0 0 0 0 0 0

15 CHANNEL ROUTE - MOHAWK RIVER HELCON W. CANADA CREEK
 ISTAT ICOPP IECON ITAFE JPLY JFRT INAPE ISTAGE I AUTO
 0 0 0 0 0 0 0 0 0 0

HYDROGRAPH ROUTING
 ROUTING DATA
 GLOSS CLOSS AVG IRES ISAPE IOFT IFPP LSTR

C.C. U.CCU C.CC 0 1 0 0 0
 NSTPS NSTDL LAG AMSK X TSK STORA ISPRAT
 1 0 0 1.500 C.200 C.CCC C. C. 0

.....

SUB-AREA RUNOFF COMPLETION

16 SUB AREA-6 RUNOFF
 ISTAT ICCPF IRECON ITAFE JPLT JFRT JINAPE IJSTAGE IAUTO
 C C 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IHTGG IUHG TAREA SNAF TRSDA TRSFC RATIO ISNOW ISAME LOCAL
 1 0 375.00 0.CC 3456.00 0.CC C.CCC C 1 C

PRECIP DATA
 SFFE FWS R4 R6 R72 R96
 0.00 21.90 37.50 52.00 62.50 73.50 79.00 C.00

TRSEC COMPUTED BY THE PROGRAM IS 0.925

LOSS DATA
 LQOPT STRK ULTR WTICL ERAIN STRKS WTICK STRTL CNSTL ALSPA RTIME
 C 0.07 1.00 1.00 1.00 C.CC C.CC 1.00 C.CC C.CC C.CC 0.00

UNIT HYDROGRAPH DATA
 TC= 22.55 R= 15.28 NTA= C

RECESSION DATA
 STRTG= 725.CC GRCSN= 5700.00 RTI08= 1.50

UNIT HYDROGRAPH	97	END-OF-PERIOD	ORDINATES,	LAC=	20.02	HOURS,	CP=	0.6E	VOL=	1.0C
98	567.	754.	1612.	1722.	2270.	2847.	3466.	4063.	4652.	
5330.	5963.	6547.	7051.	7475.	7822.	8043.	8287.	8404.	8440.	
8385.	8234.	7919.	7476.	7019.	6591.	6168.	5811.	5456.	5123.	
4810.	4516.	4241.	3924.	3739.	3510.	3296.	3095.	2906.	2728.	
2562.	2406.	2259.	2121.	1991.	1870.	1756.	1648.	1548.	1453.	
1309.	1261.	1203.	1150.	1061.	956.	935.	878.	824.	774.	
727.	682.	641.	602.	565.	530.	498.	468.	439.	412.	
387.	363.	341.	320.	301.	283.	265.	249.	220.	220.	
206.	194.	182.	171.	160.	150.	141.	133.	125.	117.	
110.	103.	97.	91.	85.	80.	75.				

MO.DA HR.MN PERIOD RAIN EACS LCSS COMP G END-OF-PERIOD FLOW PERIOD RAIN EACS LOSS COMP G
 SUP 16.07 12.00 4.07 2988156.
 (406.)(305.)(103.)(4615.0P)

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HYDROGRAPH ROUTING

17 CHANNEL ROUTE - N. CANADA CREEK BELOW HINCKLEY RESERVOIR (USGS 344C)
 ISTAG ICGPF IECOM ITAFE JFLT INAME ISTAGE I AUTO
 1 0 0 0 0 0 1 0

ROUTING DATA

QLSS CLOSS AVS IRES ISAME IOFT IPFP LSTR
 C.0 0.000 0.00 1 1 0 0 C
 NSTFS NSTDL LAG ARSKX X TSK STGRM ISFRAT
 1 0 0 0.000 0.000 0.000 0.000 1379CC. C

STORAGE 53170.00 26400.00 129710.00 161100.00 164240.00 167750.00 170100.00 174400.00
 OUTFLOW C.00 0.00 0.00 474.00 1340.00 2462.00 3750.00 5297.00

.....

SUB-AREA RUNOFF COMPUTATION

18 SUB AREA-7 RUNOFF

ISTAG ICGPF IECOM ITAFE JFLT INAME ISTAGE I AUTO
 7 C 0 0 0 0 1 0

HYDROGRAPH DATA

INVS IUNG TAREA SNAF TRSDA TRSFC PATIC ISNOW ISAME LOCAL
 1 C 7.00 0.00 3426.00 0.00 0.000 0.000 0.000 1 0

PRECIP DATA

SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 21.90 37.50 52.00 62.50 73.50 79.00 89.00

TRSPC COMPUTED BY THE PROGRAM IS L.929

LOSS DATA

LGFT STRK DLTR RTGL ERIN STRS RTIOK STRTL CNSTL ALSPX RTIIF
 C 0.07 1.00 1.00 C.00 C.00 C.00 1.00 C.00 C.00 C.00 C.00 C.00

UNIT HYDROGRAPH DATA

TC= 7.12 R= 4.51 NTA= C

RECESSION DATA

STRCH= 7.00 GRCSA= 50.00 RTIOW= 1.30

UNIT HYDROGRAPH 30 END-OF-PERIOD ORDINATES, LAGR 0.00 HOURS, CPM C.00 VOL= 1.00
 31. 113. 223. 340. 437. 491. 444. 440. 300.
 252. 159. 110. 104. 86. 70 57 47 293.

25. 21. 17. 14. 11. 5. 7. 6. 5.
 C
 NO.DA HR.MN PERIOD MAIN EXCS LOSS COMP Q PC.DA HR.MN PERIOD MAIN EXCS LOSS COMP Q
 SUP 16.07 12.00 4.07 55565.
 (4CB.)(3CS.)(103.)(1573.42)

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COMBINE HYDROGRAPHS

19 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT TRENTON
 ISTATG ICCPF IECON ITAFI JFLT JFRT INARE ISTATG I-UTO
 TCC7 2 0 0 0 0 0 1 0 0

.....

SUB-AREA RUNOFF COMPUTATION

20 SUB AREA-0 RUNOFF
 ISTATG ICCPF IECON ITAFI JFLT JFRT INARE ISTATG I-UTO
 8 C 0 0 0 0 0 1 0 0

HYDROGRAPH DATA

INYDQ IUPG TAREA SNAF TRSDA TRSPC RATIO ISNOW ISAME LOCAL
 1 C 53.00 0.CC 3456.00 0.00 0.000 0 1 0

PRECIP DATA

SFFE PMS WC W12 W24 W48 R72 R96
 C.CC 21.90 37.50 52.00 62.50 73.50 76.00 C.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA

LNOFF STRKH OLTRF M10CL EMAIN STRKS M10CK STBTL CNSTL ALSPH RTIHF
 C 0.07 1.00 1.00 C.00 0.CC 1.00 C.00 C.00 C.00 C.00

UNIT HYDROGRAPH DATA

TC= 11.62 R= 6.25 NTA= C

RECESSION DATA

STATION 72.CC QRCEN= 53C.CC RTI0R= 1.30

UNIT HYDROGRAPH 4C END-OF-PERIOD ORDINATES. LAG= 9.71 MCLRS. CP= 0.73 VOL= 1.CC
 90. 333. 663. 1052. 1420. 1814. 2169. 2430. 2584. 2638.
 2505. 2369. 2079. 1771. 1509. 1285. 1055. 833. 755. 677.
 577. 491. 410. 356. 304. 259. 220. 186. 170. 136.
 110. 99. 84. 72. 61. 52. 44. 38. 32. 27.

C
 MO.DA HR..MN PERIOD RAIN EXCS LOSS COMP G END-OF-PERIOD FLOW PD.DA HR..MN PERIOD RAIN EXCS LOSS COMP G
 SUM 10.07 12.00 4.07 426114.
 (4CB.)(3CS.)(103.)(12066.15)

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COMBINE HYDROGRAPHS

21 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK TO EAST BRIDGE (LSGS 346C)
 ISTAT ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I AUTO
 TCCR 2 0 0 0 0 0 0 1 C 0

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HYDROGRAPH ROUTING

22 CHANNEL ROUTE - W. CANADA CREEK TO EAST BRIDGE (LSGS 346C)
 ISTAT ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I AUTO
 TCCR 1 0 0 0 0 0 0 1 C 0

ROUTING DATA
 WLOSS CLOSS AWA IPRES ISAME ICFI IPFP LSTR
 C.0 0.000 0.000 0 1 0 0
 NSTPS NSTOL LAG AMSKK X TSK STCBA ISPRAT
 4 0 1.000 0.300 0.000 C.

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SUB-AREA RUNOFF CORRELATION

23 SUB AREA-5 RUNOFF
 ISTAT ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I AUTO
 5 0 0 0 0 0 0 1 C 0

HYDROGRAPH DATA
 ISTAT ISTAT TAKTA SNAF TRSDA TRSEC RATIO ISNOV ISAME LOCAL
 1 1 141.00 0.00 3450.00 0.00 C.000 C.000 C.

PRECIP DATA
 SPTS PMS R6 R72 R24 R68 R72 R96
 C.00 21.90 37.50 52.00 62.50 73.50 76.00 C.00

LOSS DATA
 L-OFT STBKS DLTR RTIOL FRAIN STOKS RTIOL STRTL CNSTL ALSPR RTI-F
 C 0.07 1.00 1.00 C.00 C.00 1.00 C.00 C.00 C.00 C.00

TRSFC COMPUTED BY THE PROGRAM IS 0.925

UNIT HYDROGRAPH DATA
 TC= 14.17 M= 7.00 NTA= C

RECESSION DATA
 STRTQ= 150.00 QRC5N= 1450.00 RTI0R= 1.30

UNIT HYDROGRAPH	45	END-OF-PERIOD	ORDINATE	LAC	11.63	HCLRS	CP	0.75	VOL	1.00
158.	510.	1021.	1598.	2210.	2839.	3473.	4072.	4555.	4867.	
5079.	5135.	4812.	4345.	3775.	3272.	2836.	2458.	2130.		
1846.	1600.	1202.	1041.	503.	762.	678.	588.	509.		
441.	331.	287.	249.	216.	187.	162.	140.	122.		
106.	91.	69.	60.							

PO.DA NR.MN PERIOD RAIN EXCS LCSS COMP Q PO.DA NR.MN PERIOD RAIN EXCS LOSS COMP G
 SUP 16.07 12.00 4.07 977729.
 (406.)(305.)(103.)(27686.1E)

COMBINE HYDROGRAPHS

24 COMBINE 2 HYDROGRAPHS FOR W. CANADA CREEK AT EAST BRIDGE (USGS 3440)

ISTAQ ICOPP IECON ITAFE JPLT JFT INAME ISTAR I AUTO
 1009 2 0 0 0 0 1 0

HYDROGRAPH ROUTING

25 CHANNEL ROUTE - W. CANADA CREEK TO MORAWE RIVER

ISTAQ ICOPP IECON ITAFE JPLT JFT INAME ISTAR I AUTO
 1010 1 0 0 0 0 1 0

ROUTING DATA
 QLCSS CLCSS AVG IRES ISAME IOFT IFPP LSTR
 C.C 0.000 0.000 0 0 0 0 0

NSTPS NSTEL LAG ANSKV X TSK STCRN ISFRAT
 1 0 0 0.720 0.300 C.C00 C.

SUB-AREA RUNOFF COMPLETION

26 SUB AREA-10 RUNOFF
 ISTAR ICOPP IECON ITAFE JPLT JFT INAME ISTAR I AUTO

.....
 ROUTING DATA
 GLOSS CLOSS AVG IRES ISAPE IOFT JFPP LSTR
 C.C 0.000 0.00 0 1 0 0 C
 NSTPS NSTDL LAG ARSEK X TSK STORA ISFRAT
 1 0 2.110 0.200 C.CC C. C

SUB-AREA RUNOFF COMPUTATION

29 SUB AREA-11 RUNOFF
 ISTAT ICCPF IRECON ISTATE JFJLT JFRT INRPE ISTATG I AUTO
 11 C 0 0 0 0 0 0 1 0 C 0

HYDROGRAPH DATA
 IMYGG IUFG TAREA SNAP TRSDDA TRSPC MATIC ISNOW ISAPE LOCAL
 1 C 27.00 0.00 3456.00 0.00 C.CC C 0 1 0

FRECIPI DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 C.CC 21.90 37.50 52.00 62.50 73.50 79.00 C.00

THSFC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA
 LHOPT STWR DLTKR RTIOL ERAIN STRKS RTIOK SIRTL CNSTL ALSPI RTIPE
 C 0.07 1.00 1.00 C.00 C.00 1.00 C.00 C.00 C.CC C.CC

UNIT HYDROGRAPH DATA
 TC= 9.83 R= 5.63 NTA= C

RECSSION DATA
 STRTQ= 32.00 QRCSN= 280.00 RTION= 1.50

UNIT HYDROGRAPH 36 END-OF-FERICO ORDINATES, LAC= 8.2C HOURS, CP= 0.71 VOL= 1.0C
 65. 234. 473. 733. 1004. 1250. 1428. 1522. 1575. 1446.
 1259. 1054. 822. 618. 517. 433. 362. 303. 254.
 214. 148. 144. 104. 87. 73. 61. 51. 43.
 34. 25. 21. 18. 15.

END-OF-FERICO FLOW
 MG.DA HR.MN PERIOD RAIN EXCS LCSS COMP Q PU.DA HR.MN PERIOD RAIN EXCS LOSS COFF C
 SUP 16.07 12.00 4.07 217007.
 (408.)(305.)(103.)(6144.95)

COMBINE HYDROGRAPHS

30 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER IN LITTLE FALLS
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 1211 2 0 0 0 0 0 1 C 0

HYDROGRAPH ROUTING

31 CHANNEL ROUTE - MOHAWK RIVER AT LITTLE FALLS (USGS 3470)
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 1212 1 0 0 0 0 1 C 0
 ROUTING DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 1213 1 0 0 0 0 1 C 0
 LOSS DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 1214 1 0 0 0 0 1 C 0
 RECURSION DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 1215 1 0 0 0 0 1 C 0

SUB-AREA RUNOFF COMPUTATION

32 SUB AREA-12 RUNOFF
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 12 0 0 0 0 0 1 C 0

HYDROGRAPH DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 12 0 0 0 0 0 1 C 0

PRECIP DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 12 0 0 0 0 0 1 C 0

LOSS DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 12 0 0 0 0 0 1 C 0

UNIT HYDROGRAPH DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 12 0 0 0 0 0 1 C 0

RECURSION DATA
 ISTAT ICOPP IECON ITAFE JFLT JFPT INAPE ISTAGE I/AUTO
 12 0 0 0 0 0 1 C 0

UNIT HYDROGRAPH 55 END-OF-PERIOD ORDINATES, LAG= 8.04 HOURS, CP= 0.72 VOL= 1.00
 1034. 219. 433. 670. 915. 1130. 1275. 1342. 1322. 1217.
 603. 760. 927. 1100. 1275. 1342. 1322. 1217.
 141. 172. 203. 234. 265. 296. 327. 358. 389. 420.

TRNSP COMPUTED BY THE PROGRAM IS 0.929

28. 23. 19. 16. 13.

END-OF-PERIOD FLOW
 MO.DA MR.WN PERIOD MAIN EXCS LOSS COMP C
 SUP 16.07 12.00 4.07 185130.
 (408.)(305.)(103.)(5242.25)

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COMBINE HYDROGRAPHS

33 COMBINE 2 HYDROGRAPHS AT ROHAWK RIVER IN LITTLE FALLS (USGS 347C)
 ISTAQ ICOPF ITECON ITAFE JFLT JFRT INAPE ISTAGE I-AUTO
 1012 2 0 0 0 0 0 1 C 0

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HYDROGRAPH ROUTING

34 CHANNEL ROUTE - ROHAWK RIVER BELCH E. CANADA CREEK
 ISTAQ ICOPF ITECON ITAFE JFLT JFRT INAPE ISTAGE I-AUTO
 1013 1 0 0 0 0 0 1 C 0
 ROUTING DATA
 GLCSS CLOSS AVG IRES ISAPE IOFT IFPP LSTR
 C.C 0.000 0.00 0 1 0 0 0
 NSTPS NSTDL LAG AMSEK X TSK STGBA ISFRAT
 1 0 0 0.900 0.200 C.C00 C.

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SUB-AREA RUNOFF COMPLETION

35 SUB AREA-13 MUNCIE
 ISTAQ ICOPF ITECON ITAFE JFLT JFRT INAPE ISTAGE I-AUTO
 13 C 0 0 0 0 0 1 C 0
 HYDROGRAPH DATA
 INYDU IUPG TAKEA SNAF TRSDA TRSFC MATIC ISNOW ISAME LOCAL
 1 0 201.00 0.00 3450.00 0.00 C.000 C 1 0
 PRECIP DATA
 SPFE PMS R6 R12 R24 R48 R72 R96
 0.00 29.10 37.50 52.00 62.50 73.50 75.00 896
 C.00

LOSS DATA
 LCOPT STRK ULTR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSPL RTIPL
 J 0.07 1.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC= 17.05 R= 7.26 NTA= C

RECESSION DATA
 STRTQ= 480.00 ORCSM= 3650.00 RTIOP= 1.30

UNIT HYDROGRAPH 52 END-OF-PERIOD ORDINATES, LAE= 14.02 MCLRS, CPA= 0.77 VOL= 1.00
 201. 746. 1500. 2101. 3283. 4237. 5208. 6181. 7112. 7985.
 8637. 9093. 9367. 9466. 9334. 8646. 7643. 6913. 6088.
 5361. 4722. 4158. 3662. 3225. 2840. 2501. 1940. 1708.
 1505. 1325. 1167. 1028. 797. 618. 544. 479.
 422. 372. 286. 254. 224. 173. 153. 135.
 118. 104.

END-OF-PERIOD FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LCSS COMP G PC.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
 SUP 21.36 16.91 4.45 2943572.
 (542.)(420.)(113.)(83352.56)

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SUB-AREA RUNOFF COMPUTATION

36 SUB AREA-14 RUNOFF
 ISTATG ICOPF IECON ITAFE JPLT JFPT INAPE ISTAGE IAUO
 14 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IMYDQ TUNG TAREA SNAF TRSDA TRSFC PATIC ISNOW ISARE LUGAL
 1 0 30.00 0.00 3656.00 0.00 0.00 0 0

PRECIP DATA
 SPFE PMS R6 RT2 R24 R48 R72 R96
 0.00 21.90 37.50 52.00 62.50 73.50 75.00 0.00

TRSFIC CONTROLLED BY THE PROGRAM IS 0.925

LOSS DATA
 LCOPT STRK ULTR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSPL RTIPL
 C 0.07 1.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC= 10.04 R= 5.64 NTA= C

RECESSION DATA
 STRTQ= 37.00 ORCSM= 320.00 RTIOP= 1.30

UNIT HYDROGRAPH 36 END-OF-PERIOD ORDINATES, LAG= 8.31 HOURS, CP= 0.71 VOL= 1.00

70.	257.	504.	788.	1079.	1350.	1551.	1663.	1689.	1618.
1429.	1197.	1002.	839.	702.	586.	492.	412.	345.	289.
242.	202.	169.	142.	115.	99.	83.	70.	58.	49.
41.	36.	29.	24.	20.	17.				

MO.DA NR.MN PERIOD RAIN EXCS LCSS COMP Q PO.DA HR.MN PERIOD RAIN EXCS LOSS COMP G

SUP 16.07 12.00 4.07 241583.
(4CB.)(3CS.)(103.)(6835.20)

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COMBINE HYDROGRAPHS

37 COMBINE 2 HYDROGRAPHS AT E. CANADA CREEK AT EAST CREEK (USGS 348C)

INSTAG	ICOPP	IECON	ITAFE	JPLT	JFRT	INAPE	ISTAGE	IAUTO
1014	2	0	0	0	0	1	C	0

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HYDROGRAPH ROUTING

38 CHANNEL ROUTE - E. CANADA CREEK TO EAST CREEK (USGS 348D)

INSTAG	ICOPP	IECON	ITAFE	JPLT	JFRT	INAPE	ISTAGE	IAUTO
1014	1	0	0	0	0	1	C	0

ROUTING DATA

GLSS	CLSS	AVG	IRIS	ISAME	IOFT	IFPP	LSTR
C.C	0.000	C.CC	0	1	0	0	C

ROUTING DATA

NSTFS	NSTDL	LAG	AMSK	X	TSK	STGRA	ISFRAT
1	0	0	14.000	C.CC	0.CC	C.	C

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HYDROGRAPH ROUTING

39 CHANNEL ROUTE - POCANUK RIVER BELOW E. CANADA CREEK

INSTAG	ICOPP	IECON	ITAFE	JPLT	JFRT	INAPE	ISTAGE	IAUTO
1015	1	0	0	0	0	1	C	0

ROUTING DATA

GLSS	CLSS	AVG	IRIS	ISAME	IOFT	IFPP	LSTR
C.C	0.000	0.CC	0	1	0	0	C

ROUTING DATA

NSTFS	NSTDL	LAG	AMSK	X	TSK	STORA	ISFRAT
1	0	0	1.000	0.200	0.000	C.	C.

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SUB-AREA RUNOFF COMPLETION

40 SUB AREA-15 RUNOFF
ISTAG ICCPF IECON ITAPE JPLT JFBT INAPE ISTAGE JAUTO
15 0 0 0 0 0 0 0 0 0

HYDROGRAPH DATA
I IUNG TAREA SNAF TRSDA TRSFC RATIC ISNOW ISAME LOCAL
1 0 37.00 0.00 3456.00 0.00 0.000 0 1 0

PRECIP DATA
SFPE PMS RC RT2 R24 R48 R72 R96
0.00 21.90 37.50 52.00 62.50 73.50 75.00 0.00

THSFC COMPLETED BY THE PROGRAM IS 0.926

LOSS DATA
LROPT STRR DLTR RTIOL ERAIN STRKS RTIOL STP7L CNSTL ALSPZ R72PF
0 0.07 1.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
TC= 10.48 R= 5.26 NTA= 0

RECESSION DATA
STRTG= 44.00 WRCSM= 400.00 RTIOR= 1.30

UNIT HYDROGRAPH 37 END-OF-PERIOD COORDINATES, LACH= 8.87 HOURS, CP= 0.73 VCL= 1.00
7c. 687. 576. 885. 1214. 1532. 1785. 1541. 2002. 1967.
1798. 1542. 1249. 1095. 923. 776. 655. 552. 466. 392.
331. 274. 198. 141. 118. 100. 84. 71.
50. 42. 36. 30. 25. 21.

END-OF-PERIOD FLOW
MO.DA HR.MN PERIOD RAIN EXCS LCSS COMP Q PU.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
0 16.07 12.00 4.07 297725.
(408.)(305.)(103.)(8430.63)

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COMBINE HYDROGRAPHS

41 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW E. CANADA CREEK
ISTAG ICCPF IECON ITAPE JPLT JFBT INAPE ISTAGE JAUTO
1015 3 0 0 0 0 0 0 0 0

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HYDROGRAPH ROUTING

42 CHANNEL ROUTE - MOHAWK RIVER HELON CAROGA CREEK
 ISTAQ 1016 1 ICCPP 0 IECON 0 ITAFE 0 JFLT 0 JFRT 0 INAPE 1 IASTG 0 IAUTO 0
 ROUTING DATA
 QLOSS 0.0 CLOSS 0.000 C-CC 0.000 AVG 0 IRES 0 ISAPE 1 IOFT 0 IFPP 0 LSTR C
 NSTFS 1 NSTDL 0 LAG 0 AMSK 0 TSK 0 STGMA 0 ISPRAT C
 C-CC 2.500 C-CC 0.200 C-CC 0.000

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SUB-AREA RUNOFF COMPLETION

43 SUB AREA-16 RUNOFF
 ISTAQ 16 1 ICCPP 0 IECON 0 ITAFE 0 JFLT 0 JFRT 0 INAPE 1 IASTG 0 IAUTO 0

HYDROGRAPH DATA
 INYGG 1 IUNG 0 TAREA 0 SNAF 0 TRSDA 0 TRSFC 0 RATIO 0 ISNOW 0 ISAVE 1 LOCAL 0
 C-CC 151.00 C-CC 3450.00 C-CC 0.00 C-CC 0.00

PRECIP DATA
 SFFE 0.00 PMS 21.90 R1 37.50 R2 62.50 R48 73.50 R72 79.00 R96 79.00
 C-CC 0.00 C-CC 0.00 C-CC 0.00 C-CC 0.00 C-CC 0.00 C-CC 0.00 C-CC 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA
 LROFT 0 STRKR 0.07 OLTRK 1.00 RTIOL 1.00 ERAIN 0.00 STRKS 0.00 RTIOR 1.00 CNSTL 0.00 ALSPA 0.00 RTIIF 0.00

UNIT HYDROGRAPH DATA
 TC= 18.56 R= 17.51 NTA= C

RECESSION DATA
 STRKR= 250.00 GRCSN= 3500.00 RTIOR= 1.30

UNIT	HYDROGRAPHIC	END-OF-PERIOD	ORDINATES	LAG=	17.35	HOURS	CP=	0.54	VOL=	0.14
47.	177.	363.	834.	1102.	1385.	1681.	1926.	2293.		
2575.	2024.	3030.	3321.	3405.	3443.	3428.	3333.	3171.		
2999.	2030.	2602.	2399.	2268.	2145.	2029.	1916.	1814.		
1716.	1622.	1534.	1372.	1298.	1227.	1161.	1097.	1038.		
581.	528.	478.	430.	385.	342.	300.	259.	219.		
501.	531.	502.	449.	425.	402.	380.	359.	340.		
321.	304.	287.	257.	233.	203.	194.	194.	194.		
184.	174.	164.	155.	147.	139.	131.	124.	111.		
95.	84.	74.	64.	54.	44.	34.	24.	14.		

60. 57. 54. 51. 48. 45. 43. 41. 38. 36.

0
 WC.DA HR.MN PERIOD RAIN ERCS LCSS COMP G END-OF-PERIOD FLOW PD.DA HR.MN PERIOD RAIN ERCS LOSS COMP G
 SUM 16.07 12.00 4.07 12125C9.
 (48.)(35.)(103.)(34334.4C)

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COMBINE HYDROGRAPHS

44 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELCH OTSQUAGO CREEK
 ISTAT IECON ITAPE JFLT JFRT INAME ISTAGE I-AUTO
 1016 2 0 0 0 0 0 1 0 0 0

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HYDROGRAPH ROUTING

45 CHANNEL ROUTE - MOHAWK RIVER BELCH OTSQUAGO CREEK
 ISTAT IECON ITAPE JFLT JFRT INAME ISTAGE I-AUTO
 1016 1 0 0 0 0 0 1 0 0 0
 ROUTING DATA
 QLCSS AVG IRES ISAME IOFT IPFP LSTR
 C.0 0.000 0 1 0 0 0
 NSTFS NSTDL LAG AMSVK X TSK STGRA ISFRAT
 1 0 0 1.000 0.200 C.000 C.

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SUB-AREA RUNOFF COMPLETION

46 SUB AREA-17 RUNOFF
 ISTAT ICCPP IECON ITAPE JFLT JFRT INAME ISTAGE I-AUTO
 17 0 0 0 0 0 0 1 0 0 0
 HYDROGRAPH DATA
 INYDG IUNG TAREA SNAF TRSDA TRSFC RATIO ISNOW ISAME LOCAL
 1 0 59.20 0.00 3456.00 0.00 C.000 0 1 C

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PRECIP DATA

SPEE FWS R6 R72 R96
 0.00 21.90 17.50 52.00 62.50 73.50 79.00 79.00 C.00

PRECIP DATA

TRNSPC COMPUTED BY THE PROGRAM IS 0.929

UNIT HYDROGRAPH DATA
 TC= 11.26 R= 6.26 NTA= C

UNIT HYDROGRAPH DATA
 TC= 11.26 R= 6.26 NTA= C

RECESSION DATA
 STRTU= RZ.LC QRCSN= 600.00 RTIQR= 1.30

UNIT HYDROGRAPH 40 END-OF-PERIOD ORIGINATES, LAE= 9.9E HCLBS, CP= 0.74 VOL= 1.00
 911. 715. 1533. 1559. 2352. 2669. 2832. 2907.
 2873. 2700. 2029. 1473. 1255. 1069. 911. 776.
 661. 480. 349. 297. 253. 210. 184. 157.
 133. 97. 83. 70. 60. 51. 37. 32.

END-OF-PERIOD FLOW
 PC.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
 SUP 16.07 12.00 4.07 475522.
 (408.)(305.)(103.)(13465.27)

.....

SUB-AREA RUNOFF CORRELATION

67 SUB-AREA-12 RUNOFF
 ISTATG IECPP IECON IFAFE JPLT JFPT INAME ISTAGE IMAUTO
 18 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IHYDS IUDC IAREA SNAF TRSDA TRSFC RATIO ISNOW ISARE LOCAL
 1 0 13.70 0.00 3450.00 0.00 0.000 C C

PRECIP DATA
 SPTS PMS R1 R2 R3 R4 R5 R6 R7 R8 R9 R10
 0.00 21.90 37.50 52.00 62.50 73.50 79.00 84.00 89.00 94.00 99.00

TRSF C COMPUTED BY THE PROGRAM IS 0.925

LOSS DATA
 LEQFT STRKR ULTKR RTICL ERAIN STRKS RTIQR STRTL CNSTL ALSWA STIWF
 0.00 0.00 1.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC= 8.45 R= 5.22 NTA= C

RECESSION DATA
 STRTU= 14.LC QRCSN= 100.00 RTIQR= 1.30

UNIT HYDROGRAPH 33 END-OF-PERIOD ORIGINATES, LAE= 7.04 HCLBS, CP= 0.65 VOL= 1.00
 141. 119. 657. 457. 279. 249. 219. 189. 159. 129. 99. 69. 39. 9. 0.

510. 420. 351. 290. 239. 197. 163. 134. 111. 92.
 70. 62. 51. 42. 35. 29. 24. 20. 16. 13.
 11. 9. 8.

C
 M.C.D.A. HR.MN PERIOD MAIN EXCS LOSS EXCS LOSS COMP C
 SUP 16.07 12.00 4.07 104233.
 (408.)(305.)(103.)(2951.55)

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COMBINE HYDROGRAPHS

48 COMBINE 3 HYDROGRAPHS AT MOHAWK RIVER BELOW OTSUQUAGO CREEK
 ISTAT ICCPF IECON IITAFE JFLT JFT INAME ISTAGE I-AUTO
 1010 1 0 0 0 0 0 0 0 0

.....

HYDROGRAPH ROUTING

49 CHANNEL ROUTE--MOHAWK RIVER BELOW CANAJOHARIE CREEK
 ISTAT ICCPF IECON IITAFE JFLT JFT INAME ISTAGE I-AUTO
 1019 1 0 0 0 0 0 0 0 0
 ROUTING DATA
 GLCSS CROSS AVG IRES ISAME ICFT IFPP LSTR
 C.O 0.000 0.00 1 0 0 0
 NSTFS NSTDL LAG ARSKK X TSK STORA ISFAT
 1 0 0 1.200 0.200 C.O00 C. C.

.....

SUB-AREA RUNOFF COMPUTATION

50 SUB AREA - 19 RUNOFF
 ISTAT ICCPF IECON IITAFE JFLT JFT INAME ISTAGE I-AUTO
 19 1 0 0 0 0 0 0 0 0
 HYDROGRAPH DATA
 IMSG IUNG TAREA SNAF TRSDA TRSFC PATIC ISNOW ISAME LGCAL
 1 C 72.LC C.CC 3456.CC 0.CC 0.C00 C.000 0 1 0

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FRECIF DATA

SFFS FMS R4 R12 R24 R48 R72 R96
 C.O0 21.90 37.5C 52.00 62.5C 73.50 79.00 C.O0
 THESE COMPUTED BY THE FREEMAP TC 0.026

LOSS DATA
 LROPT STRKN DLTRK RTIOL LRAIN STRKS RTIOK SIRTIL CNSIL ALSMA #TIME
 0 0.07 1.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC# 12.44 R# 0.51 NTA# C

RECESSION DATA
 SIRTG# 103.00 QMC5N# 700.00 RTIOK# 1.30

UNIT HYDROGRAPH AT END-OF-PERIOD ORIGINATES, LAG# 10.28 HGLMS, CP# 0.74 VCL# 1.00
 108. 395. 790. 1241. 1709. 2187. 2646. 3018. 3225. 3393.
 3406. 3294. 3004. 2603. 2225. 1803. 1392. 1190. 1018.
 871. 745. 632. 545. 466. 399. 292. 249. 213.
 182. 156. 133. 114. 98. 83. 71. 61. 52. 45.
 34.

MO.DA HR.MN PERIOD RAIN EXCS LOSS END-OF-PERIOD FLOW PC.DA HR.MN PERIOD RAIN EXCS LOSS COPP C
 SUP 10.07 12.00 4.07 577424.
 (408.)(305.)(103.)(16352.51)

COMBINE HYDROGRAPHS

51 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER BELCM CANAJOHARIE CREEK
 ISTAT ICOPF IECON ITAFE JFLT JFRT INAPE ISTAGE IPUTO
 101V 2 0 0 0 0 0 0 1 0 0 0

HYDROGRAPH ROUTING

52 CHANNEL ROUTE - MOHAWK RIVER AT SPRAKERS
 ISTAT ICOPF IECON ITAFE JFLT JFRT INAPE ISTAGE IPUTO
 1020 1 0 0 0 0 0 0 1 0 0 0
 ROUTING DATA
 QLOSS CLOSS AVG IPES ISAPF IOFT IFPP LSTR
 0.0 0.000 0.00 0 1 0 0 0 0
 MSTES NSTDL LAG AMSKE Y TSK STORA ISFRAT
 1 0 0 1.200 0.200 0.000 0.000 0.000 0.000 0.000 0.000

SUB-AREA RUNOFF COMPLETION

S3 SUB AREA-20 RUNOFF
 ISTAT ICCMF IECON ITAFE JFLT JPKT INAPE ISTAGE I-UTO
 20 0 0 0 0 0 0 0 0 0 0 0

HYDRO IUNG TAREA SNAF INSDA TRSFC RATIC ISNOW ISAPE LOCAL
 1 0 55.00 0.00 3450.00 0.00 0.000 C 1 1 0

PRECIP DATA
 SFE PMS R6 M12 M24 R48 R72 R96
 C.CC 21.90 37.50 52.00 62.50 73.50 79.00 C.00

TRSPC COMPUTED BY THE PROGRAM IS 0.925

LOSS DATA
 LROPT SINKR DLTRP RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSPP RTIIP
 0 C.CC 1.00 1.00 C.CC C.CC 1.00 C.CC C.CC C.CC C.CC

UNIT HYDROGRAPH DATA
 TC= 11.78 R= 0.36 NTA= C

RECESSION DATA
 STARTG= 75.00 UNCSN= 550.00 RTIOK= 1.30

UNIT HYDROGRAPH AT END-OF-FERIOD COORDINATES, LAG= 9.94 HOURS, CP= 0.74 VOL= 1.00
 90. 332. 662. 1032. 1422. 1819. 2182. 2455. 2623. 2690.
 2655. 2483. 1867. 1596. 1364. 1165. 996. 851. 728.
 622. 533. 454. 388. 332. 284. 242. 207. 177. 151.
 129. 110. 94. 81. 69. 59. 50. 43. 37. 31.
 27.

MO.DA HR.MN PERIOD RATA EXCS LCSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP S
 SUP 16.07 12.00 4.07 441616.
 (4CR.)(305.)(103.)(12505.16)

.....

COMBINE HYDROGRAPHS

S4 CURBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT SPRAKERS
 ISTAT ICCMF IECON ITAFE JFLT JPKT INAPE ISTAGE I-UTO
 1LCC 2 0 0 0 0 0 0 0 0 0 0

.....

HYDROGRAPH ROUTING

55 CHANNEL ROUTE - PCHAF RIVER BELCH CAYADUTTA CREEK
 ESTAG ICCPP IECON ITAFE JPLT JFT IMAPE ISTAGE IAUTO
 1025 1 0 0 0 0 1 0 0

ROUTING DATA
 QLOSS CLOSS AVG IRES ISAME IOFT IFRP LSTW
 C.CC C.CC C.CC C C C C C C

NSIPS NSTDL LAG AMSKE X TSK STGRA ISFRAT
 2 0 0 1.550 0.200 0.000 C. C.

SUB-AREA RUNOFF CORRELATION

56 SUB AREA-21 RUNOFF
 ESTAG ICCPP IECON ITAFE JPLT JFT IMAPE ISTAGE IAUTO
 21 C 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 IMYD IURG TAREA SNAF TRSDA TRSFC RATIC ISNOW ISAME LOCAL
 1 0 12.70 0.00 3458.00 0.00 0.000 C C C 1 0

PRECIP DATA
 SFFE PMS RA MT2 M24 R46 R72 R96
 C.CC 21.90 27.50 52.00 62.50 72.50 79.00 C.00

LOSS DATA
 LROPT STRKR DLTR RTICL ERAIN STRKS RTIOK STRTL CNSTL ALSPK RTIPE
 C 0.07 1.30 1.00 C.CC C.CC 1.00 C.CC 0.00 C.CC C.CC

UNIT HYDROGRAPH DATA
 TC= 8.01 R= 6.32 NTA= C

RECESSION DATA
 STRTN= 13.00 QRC5N= 120.00 NTION= 1.30

UNIT HYDROGRAPH 39 END-OF-FERICO COORDINATES, LAG= 7.38 HOURS, CP= 0.65 VOL= 1.00
 34. 124. 247. 384. 523. 636. 705. 727. 727. 629. 604.
 510. 440. 376. 320. 274. 233. 195. 170. 145. 124.
 106. 90. 77. 66. 56. 48. 41. 35. 30. 25.
 22. 18. 16. 13. 11. 10. 8. 7. 6.

END-OF-FERICO FLG= 0
 M.DA MR.MN PERIOD MAIN EXCS LOSS COMP Q PO.DA MR.MN PERIOD MAIN EXCS LOSS COMP Q

SUP 16.07 11.90 4.17 100847.
 (408.)(302.)(106.)(2855.67)

TRSPC COMPUTED BY THE PROGRAM IS 0.929

..... SUB-AREA RUNOFF COMPLETION

57 SUB AREA-22 RUNOFF
 ISTAT ICDFE ISECON ITAIFE JPLT JFRT INARE ISTAGE IAUTO
 22 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 INYDR IUPG IAREA SNAF TRSDA TRSFC RATIC ISEW ISAPE LOCAL
 1 C 23.00 0.00 3456.00 0.00 C.000 C 1 0

PRECIP DATA
 SFFE PMS RC R12 R24 R48 R72 R96
 0.00 21.90 37.50 52.00 62.50 73.50 79.00 84.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA
 LHOUT STRAK OLTR RTIOL ERAIN STRKS RTIOK STRTL CNSTL ALSTM RTIME
 0 0.07 1.50 1.00 1.00 0.00 1.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC= 9.61 R= 5.26 NTA= C

RECESSION DATA
 STRTOW 27.00 QRCEN= 250.00 RTIOW= 1.50

UNIT HYDROGRAPH 37 END-OF-PERIOD ORIGINATES, LAGR 8.15 HOURS, CPM 0.70 VGL= 1.00
 55. 203. 404. 626. 859. 1067. 1214. 1290. 1294.
 1041. 877. 739. 523. 442. 373. 314. 243.
 166. 159. 134. 95. 80. 67. 57. 40.
 34. 29. 24. 17. 14. 12.

MO.DA HR.MN PERIOD RAIN EXCS LOSS END-OF-PERIOD FLOW
 COMPG PC.DA HR.MN PERIOD RAIN EXCS LOSS COMPG
 SUP 16.07 11.90 4.17 183691.
 (408.)(302.)(106.)(5201.54)

..... CORNINE HYDROGRAPHS

58 CORNINE 2 HYDROGRAPHS AT CAYADUTTA CREEK AT JOHNSTOWN
 ISTAT ICDFE ISECON ITAIFE JPLT JFRT INARE ISTAGE IAUTO
 1022 2 0 0 0 0 0 1 0 0

.....

HYDROGRAPH ROUTING

59 CHANNEL ROUTE - PCHANK RIVER HELON CAYADUITA CREEK

ISTAG ICCPP IECON ITAFC JPLT JFRT INAPE ISTAGE I AUTO
1023 0 0 0 0
ROUTING DATA
GLC8 CLOS AVG IRES ISAPE ISRT IPFP LSTR
0.00 0.00 0 0 1 0
NSTFS NSTOL LAG AMSK X TSK STCRB ISFRAT
1 0 0 1.400 0.300 0.000 0

.....

SUB-AREA RUNOFF COMPLETION

60 SUB AREA-23 RUNCFF
ISTAG ICCPP IECON ITAFC JPLT JFRT INAPE ISTAGE I AUTO
23 0 0 0 0 1 0 0

HYDROGRAPH DATA

INHDU IUNG TAREA SNAF TRSDA TRSPC RATIO ISNO ISAPE LOCAL
1 0 84.00 0.00 3456.00 0.00 C.000 C.000 1 0
PRECIP DATA
SPEE PMS RA R12 R24 R48 R72 R96
0.00 21.90 37.50 52.00 62.50 73.50 79.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LEOPT STNKS ULTRY RTICL ERAIN STNKS RTIOX STRIL UNSTL ALSPA RTIME
0 0.07 1.00 1.00 0.00 0.00 1.00 C.00 C.00 C.00 C.00

UNIT HYDROGRAPH DATA

TC= 13.14 M= 6.02 NTA= C

RECESSION DATA
STNCR= 125.00 QRC5M= 870.00 RTION= 1.30

UNIT HYDROGRAPH 44 END-OF-PERIOD OPERATES- LAG= 11.06 HOURS, CP= C.74 VOL= 1.00
100 400 801 1424 1734 2220 2716 3144 3457 3651
3733 3701 3534 3191 2747 2394 2071 1792 1551 1342
1161 1004 869 732 651 563 467 421 365 315
273 236 204 172 153 132 115 99 86 74
44 54 42

END-OF-PERIOD FLOW

MO. DA HR. MN PERIOD RAIN EXCS LOSS COMP Q PO. DA HR. MN PERIOD RAIN EXCS LOSS COMP C
1.01 1.00 1 0.03 0.00 0.02 122. 1.04 4.00 76 0.00 0.00 0.00 1927.

1-03	3.00	5.5	0.01	0.00	C.01	27920.	1.06	8.00	128	0.00	0.00	255.
1-03	6.00	54	0.01	0.00	C.01	23121.	1.06	9.00	129	0.00	0.00	248.
1-03	7.00	55	0.04	0.00	C.04	22840.	1.06	10.00	130	0.00	0.00	242.
1-03	8.00	56	0.04	0.00	C.04	19740.	1.06	11.00	131	0.00	0.00	235.
1-03	9.00	57	0.04	0.00	C.04	13383.	1.06	12.00	132	0.00	0.00	229.
1-03	10.00	58	0.04	0.00	C.04	13251.	1.06	13.00	133	0.00	0.00	223.
1-03	11.00	59	0.04	0.00	C.04	13324.	1.06	14.00	134	0.00	0.00	217.
1-03	12.00	60	0.04	0.00	C.04	13581.	1.06	15.00	135	0.00	0.00	212.
1-03	13.00	61	0.07	0.00	C.07	16038.	1.06	16.00	136	0.00	0.00	206.
1-03	14.00	62	0.08	0.01	C.07	6687.	1.06	17.00	137	0.00	0.00	201.
1-03	15.00	63	0.10	0.03	C.07	7523.	1.06	18.00	138	0.00	0.00	196.
1-03	16.00	64	0.26	0.18	C.07	6542.	1.06	19.00	139	0.00	0.00	191.
1-03	17.00	65	0.09	0.02	C.07	5735.	1.06	20.00	140	0.00	0.00	186.
1-03	18.00	66	0.07	0.00	C.07	5070.	1.06	21.00	141	0.00	0.00	181.
1-03	19.00	67	0.02	0.00	C.02	4520.	1.06	22.00	142	0.00	0.00	176.
1-03	20.00	68	0.02	0.00	C.02	5063.	1.06	23.00	143	0.00	0.00	172.
1-03	21.00	69	0.02	0.00	C.02	3684.	1.07	0.00	144	0.00	0.00	167.
1-03	22.00	70	0.02	0.00	C.02	3367.	1.07	1.00	145	0.00	0.00	163.
1-03	23.00	71	0.02	0.00	C.02	3094.	1.07	2.00	146	0.00	0.00	159.
1-04	0.00	72	0.02	0.00	C.02	2845.	1.07	3.00	147	0.00	0.00	155.
1-04	1.00	73	0.00	0.00	C.00	2611.	1.07	4.00	148	0.00	0.00	151.
1-04	2.00	74	0.00	0.00	C.00	2389.	1.07	5.00	149	0.00	0.00	147.
1-04	3.00	75	0.00	0.00	C.00	2159.	1.07	6.00	150	0.00	0.00	143.

SUM 16.07 12.00 4.07 675000.
 (406.3) (305.3) (103.3) (19113.85)

FEAK	33256.	32026.	21453.	9045.	TOTAL VOLUME
CFS	507.	607.	296.	19110.	
CMS	3.55	4.50	12.02	12.46	
INCHES	90.09	241.38	305.29	316.38	
AC-FT	15881.	42551.	53819.	55773.	
TROLS CU W	15589.	52486.	66365.	68795.	

HYDROGRAPH AT STA 25 FOR PLAN 1. RTIC 1

24.	23.	22.	21.	20.	19.
19.	22.	32.	57.	169.	324.
405.	597.	629.	644.	629.	566.
549.	715.	851.	1025.	1506.	2244.
3416.	4733.	5350.	5452.	6535.	6609.
6069.	5024.	4468.	3548.	3050.	2316.
6008.	1308.	1147.	1014.	813.	673.
619.	478.	432.	385.	290.	212.
170.	166.	157.	149.	145.	138.
134.	124.	121.	118.	112.	106.
103.	98.	93.	91.	86.	82.
60.	75.	74.	70.	66.	63.
61.	50.	57.	54.	50.	48.
47.	45.	43.	41.	39.	37.
36.	34.	33.	32.	30.	28.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16628.	16015.	10727.	4522.	337429.
CMS	471.	453.	304.	128.	9555.
INCHES		1.77	4.75	6.03	
MM		45.04	120.69	152.65	158.19
AC-FT		7940.	21476.	26910.	27887.
THOUS CU M		5794.	26245.	33192.	34396.

HYDROGRAPH AT STA 23 FOR FLAN 1, RIILO 4

	69.	68.	66.	64.	62.	61.
73.	71.	56.	95.	171.	314.	59.
56.	1465.	1751.	1806.	1532.	1932.	753.
1214.	1694.	1418.	15989.	17556.	18793.	1759.
1643.	1251.	13404.	11844.	10430.	9150.	5477.
8363.	18205.	3441.	3042.	2438.	2020.	19827.
19237.	5212.	1295.	1156.	1011.	744.	6949.
4023.	1707.	457.	472.	448.	636.	2020.
1856.	511.	323.	354.	344.	414.	425.
536.	393.	287.	279.	272.	318.	414.
403.	302.	226.	215.	204.	327.	318.
310.	232.	174.	165.	161.	251.	245.
259.	179.	134.	127.	124.	188.	188.
184.	138.	103.	98.	95.	149.	145.
141.	106.				117.	111.
104.					80.	80.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	19554.	15216.	12872.	5427.	404515.
CMS	565.	544.	364.	154.	11460.
INCHES		2.13	5.70	7.21	
MM		54.05	144.83	183.18	189.83
AC-FT		6529.	25531.	32291.	33464.
THOUS CU M		11755.	31492.	39831.	41277.

HYDROGRAPH AT STA 23 FOR FLAN 1, RIILO 5

	90.	88.	86.	85.	83.	81.
97.	95.	74.	2515.	4228.	619.	77.
75.	1926.	2388.	3403.	4947.	677.	1296.
1616.	2197.	2476.	21318.	23408.	2576.	2865.
2197.	11151.	16335.	17872.	15792.	4101.	2665.
11151.	25649.	24274.	20097.	13906.	25057.	26436.
25649.	6031.	6550.	5234.	4056.	26139.	9265.
6031.	2475.	2089.	1611.	1348.	10640.	2694.
2475.	710.	603.	629.	613.	2947.	2694.
710.	538.	510.	497.	484.	592.	847.
538.	414.	392.	372.	363.	567.	552.
414.	310.	302.	294.	279.	447.	425.
310.	236.	226.	220.	215.	344.	327.
236.	183.	179.	169.	165.	251.	251.
183.	141.	134.	130.	127.	158.	193.
141.	117.	114.	110.	107.	157.	145.
117.					153.	145.
					137.	137.

HYDROGRAPH ROUTING

04 CHANNEL ROUTE - BATAVIA MILL AT WINDHAM

ISTAQ	ICCPP	IECON	ITAFE	JFLT	JFRT	JSTAGE	IAUTO
1025	1	0	0	0	0	1	0
ROUTING DATA							
LOSS	CLOSS	AVG	IRFS	ISAME	IOFT	IIPP	LSTR
0.0	0.000	0.00	0	1	0	0	0
NSTEP							
1	0	LAG	AMSK	X	TSK	STCRA	ISPHAT
	0	1.300	0.300	0	0.000	0	0

.....

SUB-AREA MURDOFF COMPUTATION

05 SUB AREA-25

ISTAQ	ICCPP	IECON	ITAFE	JFLT	JFRT	JSTAGE	IAUTO
45	0	0	0	0	0	1	0

HYDROGRAPH DATA

IRYDU	IUNG	IAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	0	186.50	0.00	3465.00	0.00	0.000	0	1	0

SPFE	PM5	M	R24	R72	R96
0.00	21.91	37.50	52.00	62.50	73.50

TRSPC COMPUTED BY THE PROGRAM IS 0.929

PRECIP DATA

LROPT	STRKR	DLTR	RTIOL	ERAIN	STRKS	RTIOX	SIRTL	ENSTL	ALSPX	RTIIF
0	0.07	2.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00

TC=	16.24	R=	8.22	NTAP=	0
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LOSS DATA

STRK6=	520.00	WRCSN=	2500.00	RTIOR=	1.50
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UNIT HYDROGRAPH DATA										
RECESSION DATA										
UNIT HYDROGRAPH	52	END-OF-PERIOD	ORDINATES	LAKE	13.45	HOURS	CP=	0.74	VOL=	1.00
149.	554.	1315.	1758.	2445.	3100.	3852.	4632.	5334.	5924.	
0301.	6053.	6664.	7230.	7710.	8122.	8492.	8824.	9124.	9394.	
3632.	3815.	3946.	4020.	4080.	4120.	4140.	4150.	4150.	4150.	
1074.	951.	842.	745.	660.	584.	517.	458.	405.	359.	
314.	261.	221.	195.	175.	155.	135.	120.	106.		
74.	63.									

END-OF-PERIOD FLOW

MO DA	PR MN	PERIOD	RATE	EXCS	LOSS	COMB	MO DA	PR MN	PERIOD	DATA	EXCS	LOSS	COMB
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SUM 16.07 11.82 4.25 1465833.
 (408.)(255.)(113.)(41507.73)

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COMBINE HYDROGRAPHS

66 COMBINE HYDROGRAPHS AT BATAVIA KILL AT WINDHAM
 ISTATG ICOMP IECON IJAFE JPLT JFRT INAPE IJSTAGE IPUTO
 1025 2 0 0 0 0 0 1 0 0

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SUB-AREA RUNOFF COMPLETION

67 SUB AREA-26
 ISTATG ICOMP IECON IJAFE JPLT JFRT INAPE IJSTAGE IPUTO
 26 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 INVOG IUNG TAREA SNAF TRSDA TRSFC RATIO ISNO ISAME LCCPL
 1 0 10.20 0.00 3456.00 0.00 0.000 0 1 0

PRECIP DATA
 SFFE PMS R6 R12 R24 R48 P72 R96
 0.00 21.90 37.50 52.00 62.50 73.50 79.00 80.00

TRSDA COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA
 LROFT STRK DLTAR RTIUL ERAIN STRKS RTIOK STRIL CNSTL ALSM RTIME
 0 0.07 1.50 1.00 1.00 0.00 1.00 1.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC= 7.65 N= 4.73 NTA= C

RECESSION DATA
 STRTQ= 10.00 QRCSN= 70.00 RTIOW= 1.30

UNIT HYDROGRAPH 30 END-OF-FERTIC ORDINATES, LAL= 6.32 HOURS, CP= 0.25 VOL= 1.00
 42. 153. 300. 460. 601. 717. 769. 803. 833. 867. 897. 927.
 241. 296. 341. 386. 431. 476. 521. 566. 611. 656. 701. 746.

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
 END-OF-FERTIC FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
 SUM 16.07 11.82 4.25 1465833.
 (408.)(255.)(113.)(41507.73)

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COMBINE HYDROGRAPHS

68 COMBINE 2 HYDROGRAPHS AT SCHORHIE CREEK AT FRATTSVILLE (USGS 3500)
 ISTAG ICOMP ISECON ITAPE JPLT JERT INAPE ISTAGE IAUTO
 1026 2 0 0 0 0 0 0 0 0 0 0 0 0

.....

SUB-AREA RUNOFF COMPUTATION

69 SUB AREA-127 RUNOFF
 ISTAG ICOMP ISECON ITAPE JPLT JERT INAPE ISTAGE IAUTO
 127 0 0 0 0 0 0 0 0 0 0 0 0 0

HYDRO IUNG TAREA SNAP TRSDA TRSFC RATIO ISNOV ISAME LOCAL
 1 C 76.00 0.00 3456.00 0.00 C.000 0 0 1 0 0

PRECIP DATA

SFEW PMS MC M12 R24 R48 R72 R96
 C.00 21.90 37.50 52.00 62.50 73.50 79.00 C.00

TRNSFC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA

EROPT STRKR DLTRK RTICL ERAIN STRKS RTIOX STRIL CNSTL ALSPX RTIME
 0 C.00 1.50 1.00 C.00 C.00 1.00 C.00 C.00 C.00 C.00 C.00

UNIT HYDROGRAPH DATA

TC= 12.96 R= 6.54 NTA= C

RECESSION DATA

STRTR= 115.00 QMCSN= 800.00 RTIOH= 1.30

UNIT HYDROGRAPH 44 END-OF-PERIOD ORIGINATES, LAG= 10.92 HOURS, CP= 0.74 VOL% 1.00
 1.4. 379. 758. 1186. 1640. 2106. 2567. 2965. 3250. 3423.
 3444. 3264. 2542. 2525. 2149. 1853. 1640. 1420. 1229.
 1004. 521. 507. 517. 447. 387. 335. 290.
 251. 188. 163. 141. 122. 106. 91. 79.
 56. 51. 38.

END-OF-PERIOD FLOW

MG.DA MR.MN PERIOD RAIN EXCS LCSS COMP G PD.DA MF.MN PERIOD RAIN EXCS LOSS COMP G
 50P 16.07 11.82 4.25 617666.
 (408.)(300.)(108.)(17490.90)

.....

COMBINE HYDROGRAPHS

70 COMBINE 2 HYDROGRAPHS AT SCHOMARIE RESERVOIR AT GILBOA DAM
 ISTATG ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I-AUTO
 10127 0 0 0 0 0 0 0 0 0

.....

HYDROGRAPH ROUTING

70(A) ROUTE OVER GILBOA DAM
 ISTATG ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I-AUTO
 10127 0 0 0 0 0 0 0 0 0
 ROUTING DATA
 IRES ISAME IOFT IFPP LSTR
 C.O 0.C00 0.C0 1 0 0 0
 NSTFS NSTEL LAG AMSK X TSK STORA ISFRAT
 1 0 0 0.C00 0.C00 0.C00 0.C00 0000C. C
 STORAGE 15530.00 4912C.C0 55260.00 6066C.C0 6175C.C0 6284C.C0 63+20.00 6501C.C0
 C.O0 C.O0 C.O0 C.O0 C.O0 348C.O0 929C.C0 18160.00 2796C.C0
 OUTFLW C.O0 C.O0 C.O0 C.O0 C.O0 C.O0 C.O0 C.O0 C.O0

.....

HYDROGRAPH ROUTING

71 CHANNEL ROUTE - SCHOMARIE CREEK BELOW COBLESKILL CREEK
 ISTATG ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I-AUTO
 1027 0 0 0 0 0 0 0 0 0
 ROUTING DATA
 IRES ISAME IOFT IFPP LSTR
 C.O 0.C00 0.C0 1 0 0 0
 NSTFS NSTEL LAG AMSK X TSK STORA ISFRAT
 4 0 0 1.400 0.300 0.C00 C. C

.....

SUB-AREA RUNOFF COMPUTATION

72 SUB AREA-27 RUNOFF
 ISTATG ICCPF IECON ITAFE JPLT JFRT INAPE ISTAGE I-AUTO
 27 0 0 0 0 0 0 0 0 0

.....

INYDU 1
 HYDROGRAPH DATA
 SNAF 497.00
 TAREA 0.00
 TRSDA 3456.00
 TRSFC 0.00
 RATIO 0.00
 ISNOW 0
 ISAPE 1
 LOCAL 0
 PRECIP DATA
 SFE 0.00
 R1 21.90
 R2 57.50
 R3 62.50
 R4 73.50
 R5 79.00
 R6 896
 R7 0.00
 R8 0.00

LOSS DATA
 LROFT 0
 SIKR 1.25
 SLIKR 1.00
 RTIOL 1.00
 ERAIN 0.00
 STIKS 1.00
 RTIOK 1.00
 STIIL 0.00
 CNSTL 0.00
 ALSPA 0.00
 RTIIF 0.00

UNIT HYDROGRAPH DATA
 TC= 20.79
 N= 9.27
 NTA= C

RECESION DATA
 STRTO= 1010.00
 WRC5N= 6800.00
 RTIOK= 1.30

UNIT	HYDROGRAPH	64	END-OF-PERIOD	COORDINATES	ELEV	17.22	HOURS	CP	0.76	VOL	1.00
428.	850.	1724.	2736.	5835.	5991.	6182.	7392.	8611.	9830.		
11023.	10069.	12948.	13606.	14073.	14358.	14867.	14398.	14145.	13683.		
12409.	11824.	10624.	8723.	7681.	7121.	6435.	5814.	5254.	1906.		
4747.	4289.	3676.	3502.	3164.	2859.	2583.	2334.	2109.	1906.		
1722.	1556.	1406.	1270.	1148.	1037.	937.	847.	765.	691.		
625.	564.	510.	441.	416.	376.	340.	307.	278.	251.		
227.	205.	185.	167.								

MC-DA 0
 HR-MN PERIOD RAIN EXCS LOSS COMP Q PO-DA HR-MN PERIOD RAIN EXCS LOSS COPE G
 SUP 16.07 11.92 4.15 3945252.
 (4CR.3)(3C3.)(106.)(8111716.)

COMBINE HYDROGRAPHS

73 COMBINE 2 HYDROGRAPHS AT SCHUMARIE CREEK BELOW CORLESKILL CREEK
 ISTAT ICCPF IELCN ITAFE JFLT JFRT INAPE ISTAGE I-LTO
 1027 2 0 0 0 0 0 0 0 0 0 0

HYDROGRAPH ROUTING

74 CHANNEL ROUTE - SCHUMARIE CREEK AT BURTONSVILLE (USGS 3515)
 TCTAO TCTOE TCTON TTALE TTALE TDT TDT TDAPE TDTAO TDTA

COMBINE HYDROGRAPHS

76 COMBINE 2 HYDROGRAPHS AT SCHOMARIE CREEK AT BURTONSVILLE (USGS 1515)
 ISTAT ICOPP IECON ITAFE JFLT JFRT INAPE ISTAGE IALTO
 1028 2 0 0 0 0 0 1 0 0

.....

HYDROGRAPH ROUTING

77 CHANNEL ROUTE - MCHANK RIVER BELOW SCHOMARIE CREEK
 ISTAT ICOPP IECON ITAFE JFLT JFRT INAPE ISTAGE IALTO
 1029 1 0 0 0 0 0 1 0 0

ROUTING DATA
 QLESS CLOSS AVG IMES ISAPE IOFT IIPP LSTH
 0.0 0.000 0.00 0 0 1 0 0 0 0

MSPTS NSTOL LAG AMXK X TSK STORA ISFRAT
 1 0 0 2.100 0.200 0.000 0.000 0.000 0.000 0.000

.....

SUB-AREA RUNOFF COMPLETION

78 SUB AREA - 29 RUNOFF
 ISTAT ICOPP IECON ITAFE JFLT JFRT INAPE ISTAGE IALTO
 29 0 0 0 0 0 0 1 0 0

HYDROGRAPH DATA
 INYCG IUPG IAREA SNAP TRSDA TRSFC RATIO ISNOW ISANE LOCAL
 1 0 87.00 0.00 3456.00 0.00 0.000 0.000 0.000 0.000 0.000 0.000

PRECIP DATA
 SFFC PMS MC RTZ R24 R48 R72 R96
 0.00 21.90 37.50 52.00 66.50 73.50 75.00 75.00 0.00

TRSFIC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA
 LROFT STRWR DLTRH RTIOL ERAIN STRKS RTIOK STIPL CNSTL ALSM STIPE
 0 0.07 1.10 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00

UNIT HYDROGRAPH DATA
 TC= 13.13 R= 6.75 NTA= 0

RECESSION DATA
 STRTO= 132.00 WRCSM= 920.00 RTIOK= 1.30

.....

TRNSFC COMPUTED BY THE PROGRAM IS 0.929

SPFE PMS R6 R12 R24 R48 R72 R96
 C.CC 21.90 37.50 52.00 62.50 73.50 79.00 C.00

LOSS DATA
 LWOPT STRKX DLTKR NTIOL FRAIN STRKS RTIOK STRTL CNSTL ALCPA RTIME
 C 0.07 1.00 1.00 0.00 0.00 1.00 0.00 C.CC C.CC C.CC

UNIT HYDROGRAPH DATA
 TCR= 15.61 R= 11.14 NTA= C
 STRTQ= 160.00 RECCSN= 1150.00 RTIOR= 1.50

RECCSN DATA
 UNIT HYDROGRAPH OR END-OF-PERIOD ORDINATES, LAB= 13.7R MOLRS, CP= 0.67 VOL= 1.00
 62. 245. 493. 1117. 1460. 1615. 2177. 2520. 2607.
 3031. 3191. 3269. 3321. 3332. 2895. 2646. 2419. 2211.
 2021. 1847. 1685. 1411. 1290. 1175. 1078. 985. 900.
 823. 752. 688. 629. 575. 480. 439. 411. 367.
 333. 306. 280. 234. 214. 196. 179. 163. 145.
 137. 125. 114. 104. 95. 87. 73. 67. 61.
 56. 46. 42. 35. 32. 30.

END-OF-PERIOD FLOW
 MO,DA HR,AMN PERIOD RAIN EXCS LOSS CUMP Q PO,DA HR,AMN PERIOD RAIN EXCS LOSS CUMP Q
 SUP 16.07 12.00 4.07 823683.
 (408.)(305.)(103.)(23324.08)

COMBINE HYDROGRAPHS

82 COMBINE 4 HYDROGRAPHS AT MOHAWK RIVER AT AMSTERDAM
 ISTAT ICUPP IELCON ITAPE JPLT JFRT JNARE ISTATG I-AUTO
 TC30 0 0 0 0 0 0 1 0 0

HYDROGRAPH ROUTING

83 CHANNEL ROUTE - MOHAWK RIVER AT CRANESVILLE
 ISTAT ICUPP IELCON ITAPE JPLT JFRT JNARE ISTATG I-AUTO
 1031 0 0 0 0 0 0 1 0 0
 ROUTING DATA
 QLOSS CLOSS AVG IRES ISAPE IOFT IFPP LSTR
 C.CC 0.000 C.CC 0 1 0 0 0
 NSTES NETOT IAG AMSEK Y TCR STOOD TCRDAT

..... 1 0 0 1.500 0.200 0.000 0.000 C

SUB-AREA RUNOFF COMPLETION

R4 SUB AREA-31 RUNOFF
 ISTAT ICOMP 0
 31 0

INYD	IUNG	IAREA	SNIF	TRSDA	TRSF	RATIC	ISNOW	ISAME	LOCAL
1	0	28.00	0.00	3456.00	0.00	0.000	0	1	0

PRECIP DATA
 R0 R12 R24 R48 R72 R96
 C.CC 21.90 37.50 52.00 62.50 73.50 79.00 C.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LRDPT	STERR	DLTR	RTIGL	ERRIN	STRKS	RTICK	STRTL	CNSTL	ALSPR	STIIF
0	0.07	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00

UNIT HYDROGRAPH DATA
 TC= 9.08 R= 5.79 NTA= C

RECESSION DATA
 STRTR= 34.00 GRCSN= 100.00 RTIOP= 1.30

UNIT HYDROGRAPH	37	END-OF-PERIOD	ORIGINATES	LACH	0.31	HOURS	CP	0.71	VOLR	1.00
64.	230.	469.	727.	997.	1268.	1434.	1538.	1562.	1493.	
131.	310.	432.	559.	659.	784.	866.	932.	992.	277.	
233.	194.	165.	139.	117.	98.	83.	69.	58.	49.	
41.	35.	29.	25.	21.	17.	15.				

..... C
 M+DA H+RN PERIOD RAIN ERCS LOSS COMP C
 SUP 16.07 12.00 4.07 219.23.
 (462.)(305.)(103.)(6219.02)

COMBINE HYDROGRAPHS

65 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT CRANESVILLE
 ISTAT ICOMP 2
 1031 0 0 0

INAME	ISTAGE	IAUTO
1	0	0

.....

HYDROGRAPH ROUTING

66 CHANNEL ROUTE - MCMAHON RIVER AT NOTTINGHAM JUNCTION

ISTAQ 1032 1 IECON 0 JIAFE 0 JFLT 0 JERT 0 INAPE 1 IALTO 0

ROUTING DATA

GLSS 0.000 1 AVG 0 IRES 0 IOFT 0 IIPP 0 LSTR 0

MSFS 1 NSTEL 0 LAG 0 AMSK X 1SK STGRA ISPRAT 0

0 0 2.100 0.200 0.000 0

.....

SUB-AREA RUNOFF COMPUTATION

27 SUB AREA-32 RUNOFF

ISTAQ 32 0 IECON 0 ISAFE 0 JFLT 0 JERT 0 INAPE 1 IAUTO 0

HYDROGRAPH DATA

INDD 1 IUNG 0 TAREA 0 SNAP 0 TRSDA 0 TRSFC 0 RATIO 0 ISNOW 0 ISAPE 1 LOCAL 0

0 32.00 0.00 3456.00 0.00 0.000 0

PRECIP DATA

SFFE 0 PMS R2 R12 R24 R48 R72 R96

0.00 21.90 37.50 52.00 62.50 73.50 79.00 0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.929

LOSS DATA

LNQFT 0 STWR 1.00 RTIOL 1.00 ERAIN 0.00 STRKS 1.00 RTIOR 1.00 STRTL 0.00 CNSTL 0.00 ALSPY 0.00 RTIPE 0.00

UNIT HYDROGRAPH DATA

TC= 11.09 R= 10.19 NTA= C

RECESSION DATA

STRTQ= 40.00 QRCSN= 350.00 RTIOR= 1.30

UNIT HYDROGRAPH 01 END-OF-PERIOD ORIGINATES, LAG= 10.45 HOURS, CP= 0.01 VOL= 1.1C	1229.	128.	259.	411.	577.	752.	918.	1054.	1151.	1211.
1229.	1765.	1097.	594.	372.	306.	277.	241.	207.	169.	121.
167.	176.	139.	126.	115.	104.	94.	85.	77.	77.	77.
76.	64.	52.	47.	43.	39.	35.	32.	29.	29.	29.
26.	24.	22.	20.	18.	16.	15.	15.	15.	12.	11.

34 0 0 0 0 0 0 0 0 0 0 0

HYDROGRAPH DATA
 IHYD 1 IUNG C TANEA SNAP TRSDA TRSFC RATIC ISNOW ISAPE LOCAL
 C 108.00 C.00 3456.00 C.00 C.000 C.000 0 1 0

PRECIP DATA
 SFRS PMS RO R12 R24 R48 R72 R96
 C.00 21.90 37.50 52.00 62.50 73.50 79.00 C.00

TRSPC COMPUTED BY THE PROGRAM IS C.929

LOSS DATA
 LROPT STMKX DLTRK RTIOL ERAIN STRKS RTIOL STRTL CNSTL ALSMX RTIUF
 C C.07 1.00 1.00 C.00 C.00 1.00 C.00 C.00 C.00 C.00 C.00

UNIT HYDROGRAPH DATA
 TC= 14.85 W= 8.81 NTA= C

RECESSION DATA
 STPGR= 170.00 GRCSN= 1250.00 RTIOP= 7.30

UNIT HYDROGRAPH 55 END-OF-PERIOD ORIGINATES, LAG= 12.65 HOURS, CP= C.71 VOL= 1.10
 92. 344. 655. 1099. 1534. 1988. 2453. 2915. 3322. 3635.
 3855. 4021. 3769. 3436. 3067. 2736. 2444. 2161.
 1947. 1738. 1551. 1256. 1103. 985. 879. 784. 700.
 625. 558. 496. 444. 397. 354. 282. 252. 225.
 201. 179. 160. 143. 127. 114. 101. 91. 81. 72.
 64. 57. 46.

END-OF-PERIOD FLOW
 MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP G PD.DA HR.MN PERIOD MAIN EXCS LOSS COMP G
 SUM 16.07 12.00 4.07 868935.
 (408.) (305.) (103.) (24605.48)

COMBINE HYDROGRAPHS

94 COMBINE 2 HYDROGRAPHS AT MOHAWK RIVER AT VISCPERS FERRY
 ISTAT ICCPF TECN ITAPE JFLT JFRT INAME ISTAGE I-UTO
 34 0 0 0 0 0 1 0 0

HYDROGRAPH ROUTING

95 CHANNEL ROUTE -PECANY RIVER AT CONOES (USGS 3575)
 ISTAT ICCPF TECN ITAPE JFLT JFRT INAME ISTAGE I-UTO

1L25 1 0 0 0 0 1 0 0
 ROUTING DATA
 IRES ISAPE IOFT IIPP LSTW
 C.CC 0 1 0 0 C
 NSTFS NSTOL LAG AMSXX X TSK STORA ISFRAT
 1 0 0 1.500 C.200 C.CCC C. C

.....

SUB-AREA RUNOFF COMPUTATION

96 SUB AREA-35 RUNOFF
 ISTRG ICCPP IECON ITAFE JFLT JFPT INAME ISTAGE I-UTO
 35 0 0 0 0 0 1 0 0 0

INYDG IUNG TAREA SNAF TRSDA TRSFC RATIO ISNOW ISAPE LOCAL
 1 C 33.00 0.00 3456.00 0.00 C.000 0 1 0

HYDROGRAPH DATA
 SPTS PMS R6 R12 R24 R48 R72 R96
 C.CC 21.90 37.50 52.00 62.50 73.50 79.00 C.00

TRSPC COMPUTED BY THE PROGRAM IS C.929

LOSS DATA
 LROFT STRKR ULTKR RTIOL ERRAIN STRKS RTIOK STRIL CNSIL ALSPA RTIIF
 0 C.07 1.00 1.00 C.00 0.00 1.00 C.00 C.00 C.CC C.CC 0.00

UNIT HYDROGRAPH DATA
 TC= 10.42 R= 5.48 NTA= C

RECESION DATA
 STRTQ= 41.00 GRCSN= 370.00 RTIOR= 1.30

UNIT HYDROGRAPH 38 END-OF-PERIOD COORDINATES, LACH R.86 HOURS, CP= 0.73 VOL= 1.00
 69. 254. 504. 784. 1076. 1358. 1582. 1720. 1774. 1742.
 1546. 1153. 824. 697. 540. 499. 422. 357.
 302. 255. 182. 154. 130. 110. 93. 79.
 56. 48. 34. 29. 24. 21. 17.

END-OF-PERIOD FLOW
 MU.DA HR.MN PERIOD RAIN EXCS LOSS CURP Q PD.DA HR.MN PERIOD RAIN EXCS LOSS COMP G
 SUM 16.07 12.00 4.07 266C76.
 (408.)(305.)(103.)(7534.43)

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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO	RATIOS APPLIED TO FLOWS					
					1	2	3	4	5	6
					C.2C	0.40	C.50	0.60	C.80	1.00
HYDROGRAPH AT	1	150.00 (388.50)	1	11124. (314.98)	22247. (629.97)	27809. (787.46)	33371. (944.95)	44494. (1259.93)	55618. (1574.92)	
	ROUTED TO	1001 (388.50)	1	5981. (169.37)	13919. (394.13)	17760. (502.90)	21565. (610.65)	29121. (824.60)	36633. (1037.22)	
ROUTED TO	1022 (388.50)	1	5565. (169.01)	13887. (393.23)	17721. (501.79)	21518. (609.33)	29059. (822.86)	36556. (1035.15)		
	HYDROGRAPH AT	2 (18.13)	1	786. (22.25)	1571. (44.50)	1964. (55.62)	2357. (66.75)	3143. (89.00)	3929. (111.25)	
COMBINED	1002 (406.63)	1	6629. (170.73)	14048. (397.40)	17922. (507.51)	21761. (616.19)	29382. (832.00)	36960. (1046.52)		
	ROUTED TO	1003 (406.63)	1	5971. (169.07)	13921. (394.20)	17763. (502.99)	21569. (610.76)	29126. (824.74)	36639. (1037.49)	
HYDROGRAPH AT	3 (748.50)	1	17626. (499.12)	35252. (998.23)	44065. (1247.79)	52879. (1497.35)	70505. (1996.47)	88131. (2495.58)		
	COMBINED	1003 (1155.13)	1	21641. (595.83)	44563. (1261.87)	56371. (1596.25)	68118. (1928.28)	91510. (2591.28)	114872. (3251.59)	
ROUTED TO	1004 (1155.13)	1	20742. (587.35)	43909. (1243.36)	55537. (1572.64)	67113. (1900.43)	90172. (2553.37)	113151. (3204.08)		
	HYDROGRAPH AT	4 (440.87)	1	6702. (189.79)	13405. (379.59)	16756. (474.48)	20107. (569.38)	26810. (759.17)	33512. (948.56)	
COMBINED	1004 (1395.99)	1	25249. (724.59)	53113. (1503.99)	67103. (1900.14)	81061. (2295.38)	102886. (3063.30)	136826. (3868.41)		
	ROUTED TO	1005 (1395.99)	1	24517. (694.26)	51014. (1444.56)	64399. (1823.57)	77767. (2202.12)	104445. (2957.56)	131060. (3711.20)	
HYDROGRAPH AT	5 (409.22)	1	9676. (279.75)	19757. (559.43)	24696. (699.32)	29635. (839.18)	39514. (1116.91)	49352. (1398.43)		
	COMBINED	1005 (497.07)	1	31462. (882.14)	64214. (1818.14)	81874. (2318.14)	104445. (2957.56)	131060. (3711.20)	164170. (4621.70)	

SCUTED TO	1000	1805.23	(890.60)	(1616.46)	(2266.95)	(2760.62)	(3704.23)	(4647.66)
HYDROGRAPH AT	4	697.00	31124.	63740.	40311.	96861.	129458.	163023.
		(1805.23)	(881.03)	(1806.32)	(2674.14)	(2742.79)	(3680.00)	(4616.28)
SCUTED TO	1000	375.00	17245.	34690.	43363.	52035.	69380.	86725.
HYDROGRAPH AT	4	971.04	491.16)	962.31)	1227.89)	1473.47)	1964.63)	2455.79)
SCUTED TO	1000	375.00	9219.	20146.	25537.	30902.	41604.	52264.
HYDROGRAPH AT	7	7.00	254.	1508.	1885.	2264.	3016.	3771.
		(18.13)	(21.35)	(42.71)	(53.36)	(64.06)	(85.42)	(106.77)
4 COMBINED	1007	582.00	9241.	20202.	25664.	30925.	41726.	52436.
		(989.37)	(261.68)	(572.03)	(725.01)	(877.39)	(1181.55)	(1484.43)
HYDROGRAPH AT	6	53.00	4535.	9071.	11339.	13606.	18142.	22677.
		(137.27)	(122.43)	(256.26)	(321.07)	(385.29)	(513.72)	(642.15)
2 COMBINED	1008	439.00	9352.	20899.	26493.	32063.	43166.	54253.
		(1126.64)	(270.49)	(561.81)	(750.21)	(907.92)	(1222.39)	(1536.29)
SCUTED TO	1009	435.00	9327.	20841.	26427.	31966.	43071.	54123.
HYDROGRAPH AT	1	1126.64	269.76)	590.14)	742.32)	903.79)	1219.63)	1532.32)
2 COMBINED	1009	121.00	9296.	18591.	23239.	27887.	37182.	46478.
		(313.39)	(263.22)	(526.44)	(658.06)	(789.67)	(1052.89)	(1316.11)
SCUTED TO	1010	556.00	15307.	31537.	39631.	48522.	63812.	83037.
HYDROGRAPH AT	1	1440.62	433.44)	893.59)	1130.71)	1373.99)	1663.58)	2151.92)
SCUTED TO	1010	556.00	15296.	31491.	39617.	48402.	63648.	82843.
HYDROGRAPH AT	1	1440.62	433.12)	891.74)	1127.48)	1370.60)	1658.94)	2145.45)
2 COMBINED	1010	45.00	3643.	7665.	9607.	11528.	15370.	19213.
		(116.55)	(108.81)	(217.62)	(272.03)	(326.43)	(435.24)	(544.03)
4 COMBINED	1010	1298.00	46212.	94736.	119745.	144782.	194834.	244826.
		(3341.70)	(1308.62)	(2663.19)	(3390.81)	(4099.76)	(5517.07)	(7132.19)
SCUTED TO	1011	1494.00	45317.	93669.	112275.	142961.	192393.	241736.
HYDROGRAPH AT	1	3361.28	(1288.89)	(2651.28)	(3349.16)	(4048.75)	(5447.95)	(7175.82)
2 COMBINED	1011	47.00	4329.	8938.	11322.	13866.	18115.	22644.
		(9.33)	(71.41)	(143.22)	(179.02)	(214.22)	(286.43)	(352.64)
4 COMBINED	1011	1325.00	46033.	94865.	119420.	144634.	194865.	244865.
		(3431.71)	(1309.74)	(2686.22)	(3342.91)	(4101.25)	(5517.95)	(7133.21)
TOTAL	1012	1325.00	46427.	94942.	119884.	144774.	194791.	244871.

HYDROGRAPH AT	12	23.00	(2188.	4376.	5470.	6564.	8792.	80641.
		(59.57)	(61.96)	(123.92)	(154.90)	(185.88)	(247.84)	(309.80)
2 COMBINED	1012	1368.00	66262.	95021.	119522.	144911.	184939.	244945.
		(3491.28)	(1310.00)	(2690.70)	(3395.81)	(4103.48)	(5520.04)	(6936.07)
ROUTER TO	1015	1568.00	64352.	94851.	119212.	144600.	184596.	244912.
		(3491.28)	(1306.87)	(2685.88)	(3389.87)	(4096.32)	(5510.35)	(6923.40)
HYDROGRAPH AT	13	261.00	24347.	49095.	41346.	23642.	98190.	122737.
		(679.98)	(695.10)	(1390.21)	(1737.76)	(2089.31)	(2780.42)	(3475.52)
HYDROGRAPH AT	14	30.00	2791.	5581.	4976.	8372.	11842.	13653.
		(77.70)	(79.02)	(158.04)	(197.55)	(237.06)	(316.08)	(395.10)
2 COMBINED	1016	291.00	24376.	53168.	66435.	28722.	104286.	132823.
		(753.00)	(752.49)	(1504.99)	(1881.24)	(2259.48)	(3009.98)	(3762.67)
ACUTED TO	1014	281.00	14501.	33802.	42252.	50702.	67603.	84564.
		(753.68)	(478.58)	(957.16)	(1196.44)	(1435.73)	(1914.31)	(2392.89)
ACUTED TO	1015	291.00	16661.	33721.	42151.	50542.	67442.	84303.
		(753.68)	(677.44)	(954.88)	(1193.59)	(1432.31)	(1909.75)	(2387.19)
HYDROGRAPH AT	15	37.00	3341.	6682.	8353.	10023.	13365.	16766.
		(95.83)	(94.61)	(189.22)	(236.53)	(283.83)	(378.44)	(473.05)
2 COMBINED	1015	1626.00	63735.	129914.	163541.	187255.	264723.	332170.
		(4340.79)	(1804.77)	(3678.76)	(4650.97)	(5585.63)	(7496.10)	(9405.59)
ACUTED TO	1014	1676.00	62786.	127997.	161093.	184301.	260738.	327148.
		(4340.79)	(1777.90)	(3624.44)	(4561.65)	(5501.98)	(7383.28)	(9263.40)
HYDROGRAPH AT	16	151.00	6575.	13950.	17438.	20925.	28500.	34825.
		(391.05)	(197.59)	(395.02)	(493.78)	(592.53)	(790.04)	(987.59)
2 COMBINED	1016	1827.00	68354.	139049.	174883.	210810.	282731.	354634.
		(4731.88)	(1935.56)	(3937.44)	(4952.14)	(5969.47)	(8006.04)	(10042.72)
ACUTED TO	1014	1827.00	68352.	138725.	174534.	210385.	282157.	353935.
		(4731.88)	(1931.13)	(3929.66)	(4942.24)	(5937.44)	(7986.78)	(10022.27)
HYDROGRAPH AT	17	59.20	5022.	10043.	12554.	15065.	20087.	25109.
		(153.33)	(142.20)	(284.40)	(355.50)	(426.60)	(568.80)	(711.00)
HYDROGRAPH AT	18	13.10	1327.	2655.	3318.	3982.	5309.	6637.
		(33.93)	(37.59)	(75.17)	(93.97)	(112.76)	(150.34)	(187.53)
2 COMBINED	1014	1809.30	60272.	14047.	174410.	218824.	284814.	354974.

ROUTE 10	1019	1855.10	(4919.13)	(1961.56)	(3981.68)	(5006.96)	(6035.11)	(8093.33)	(10151.71)
				65040.	140284.	124608.	212618.	285315.	357474.
				(4919.13)	(3972.72)	(4995.33)	(6020.66)	(8073.95)	(10126.82)
HYDROGRAPH AT	19	72.00	(186.48)	5865.	11928.	14812.	17864.	23050.	28824.
				(162.90)	(337.80)	(422.26)	(506.71)	(675.61)	(864.51)
2. COMBINED	1019	1021.10	(3105.61)	70137.	142201.	128768.	215453.	288094.	363560.
				(1988.06)	(4029.24)	(5067.98)	(6100.92)	(8080.86)	(10260.59)
ROUTE TO	3020	1071.10	(5105.61)	66834.	141818.	128411.	215004.	288277.	364828.
				(1980.30)	(4018.68)	(5052.04)	(6082.23)	(8163.08)	(10238.57)
HYDROGRAPH AT	24	55.00	(142.45)	4247.	9295.	11418.	13942.	18589.	23236.
				(131.60)	(263.19)	(328.99)	(394.79)	(526.38)	(657.98)
2. COMBINED	1020	2026.10	(5248.06)	70407.	143182.	129886.	216768.	290430.	364513.
				(1995.38)	(4054.46)	(5093.79)	(6138.19)	(8229.70)	(10321.84)
ROUTE 10	1021	2026.10	(5248.06)	70065.	142014.	128531.	215123.	288307.	363456.
				(1982.31)	(4021.94)	(5055.44)	(6051.61)	(8166.49)	(10242.18)
HYDROGRAPH AT	21	12.70	(32.85)	1126.	2353.	2941.	3529.	4705.	5882.
				(31.31)	(66.62)	(83.27)	(99.53)	(133.24)	(166.55)
HYDROGRAPH AT	22	21.00	(59.57)	2134.	4272.	5340.	6408.	8344.	10681.
				(60.49)	(120.98)	(151.22)	(181.46)	(241.95)	(302.44)
2. COMBINED	1022	35.70	(92.46)	3302.	6615.	8268.	9922.	13220.	16537.
				(93.65)	(187.31)	(234.13)	(280.96)	(374.61)	(468.27)
ROUTE 10	1023	35.70	(92.46)	3263.	6526.	8157.	9789.	13052.	16315.
				(92.46)	(184.80)	(230.99)	(277.19)	(369.59)	(461.99)
HYDROGRAPH AT	23	84.00	(217.56)	4651.	13302.	16428.	19954.	26405.	33254.
				(188.34)	(376.68)	(470.85)	(565.02)	(753.36)	(941.71)
2. COMBINED	1023	2166.00	(5558.08)	71172.	144330.	181105.	218393.	292698.	367066.
				(2015.36)	(4086.98)	(5133.98)	(6184.20)	(8288.30)	(10394.15)
ROUTE 10	1024	2166.00	(5558.08)	70518.	143062.	129220.	216566.	290259.	363956.
				(1996.85)	(4051.23)	(5090.50)	(6132.45)	(8219.21)	(10307.21)
HYDROGRAPH AT	24	39.10	(101.79)	3333.	6664.	8332.	9999.	13332.	16665.
				(94.30)	(188.76)	(235.94)	(283.13)	(377.51)	(471.89)
ROUTE TO	1025	39.10	(101.79)	3286.	6591.	8239.	9887.	13182.	16478.
				(93.32)	(186.64)	(233.30)	(279.56)	(373.28)	(466.00)
HYDROGRAPH AT	25	186.50	(4919.13)	12804.	25409.	32011.	38413.	51217.	64021.

2 COMBINED	1025	(483.03)	(362.58)	(725.15)	(506.44)	(1087.73)	(1450.50)	(1812.88)
HYDROGRAPH AT	40	(26.42)	(30.79)	(61.59)	(76.99)	(92.38)	(123.18)	(153.97)
2 COMBINED	1026	(611.23)	(464.72)	(937.44)	(1171.80)	(1466.16)	(1874.68)	(2343.40)
HYDROGRAPH AT	127	(262.02)	(175.45)	(350.90)	(438.63)	(526.35)	(701.81)	(877.26)
2 COMBINED	10127	(613.23)	(224.95)	(453.90)	(567.38)	(680.25)	(907.80)	(1134.75)
ROUTED TO	10127	(613.23)	(224.97)	(467.48)	(584.05)	(690.89)	(938.53)	(1118.83)
ROUTED TO	1027	(813.23)	(213.88)	(434.12)	(542.76)	(651.36)	(828.51)	(1025.75)
HYDROGRAPH AT	27	(1271.56)	(491.66)	(733.01)	(716.26)	(859.52)	(1146.02)	(1432.53)
2 COMBINED	1027	(2084.53)	(805.00)	(997.90)	(1247.61)	(1497.22)	(1966.36)	(2495.47)
ROUTED TO	1028	(2024.93)	(605.00)	(992.12)	(1240.47)	(1488.65)	(1985.03)	(2481.32)
HYDROGRAPH AT	28	(202.02)	(175.86)	(359.71)	(449.64)	(539.57)	(719.42)	(899.28)
2 COMBINED	1028	(2226.94)	(663.00)	(1055.97)	(1319.80)	(1584.01)	(2112.21)	(2640.33)
ROUTED TO	1029	(2206.94)	(643.00)	(1030.96)	(1295.00)	(1559.20)	(2079.31)	(2599.69)
HYDROGRAPH AT	29	(225.33)	(190.91)	(393.23)	(492.29)	(590.74)	(787.66)	(984.37)
2 COMBINED	1029	(8070.33)	(3116.00)	(2248.65)	(2813.39)	(3378.66)	(4510.66)	(5644.75)
ROUTED TO	1030	(8070.33)	(3116.00)	(2231.97)	(2742.25)	(3333.39)	(4477.63)	(5603.33)
HYDROGRAPH AT	30	(105.00)	(105.00)	(174.94)	(158.67)	(160.41)	(243.88)	(317.14)

	(26.77)	(175.72)	(359.45)	(445.51)	(539.17)	(718.90)	(898.22)
4 COMBINED	1030	3219.00	229305.	266997.	344605.	460145.	575778.
	(8337.11)	(3235.50)	(6495.45)	(8126.83)	(9759.81)	(13029.85)	(16304.21)
ROUTED TO	1031	3219.00	228738.	286186.	343687.	458825.	574109.
	(8337.11)	(3225.80)	(6477.13)	(8103.87)	(9732.12)	(12992.47)	(16256.55)
HYDROGRAPH AT	31	28.00	5109.	6461.	7753.	10336.	12922.
	(72.52)	(73.18)	(146.37)	(182.96)	(219.55)	(292.74)	(365.52)
2 COMBINED	1031	3247.00	229221.	286750.	344411.	459791.	575317.
	(8409.63)	(3234.70)	(6490.81)	(8120.97)	(9752.64)	(13019.83)	(16241.15)
ROUTED TO	1032	3247.00	227642.	284826.	342067.	456679.	571426.
	(8409.63)	(3213.96)	(6446.10)	(8063.43)	(9686.26)	(12931.69)	(16162.08)
HYDROGRAPH AT	32	32.00	4455.	5568.	6822.	8909.	11136.
	(82.88)	(63.07)	(126.14)	(157.67)	(189.23)	(252.27)	(315.34)
4 COMBINED	1032	3279.00	228781.	286251.	343775.	458556.	574278.
	(8492.51)	(3230.08)	(6478.34)	(8103.73)	(9734.62)	(12996.17)	(16261.72)
ROUTED TO	1033	3279.00	227281.	284390.	341534.	456014.	570619.
	(8492.51)	(3206.57)	(6435.67)	(8053.02)	(9671.72)	(12912.87)	(16159.52)
HYDROGRAPH AT	33	38.00	6802.	8502.	10202.	13603.	17004.
	(98.42)	(96.30)	(192.60)	(240.75)	(288.50)	(385.20)	(481.50)
2 COMBINED	1033	3317.00	227727.	284547.	342223.	456906.	571727.
	(8590.93)	(3214.88)	(6446.51)	(8066.81)	(9690.67)	(12938.16)	(16189.48)
ROUTED TO	1034	3317.00	225760.	282512.	339330.	453104.	567014.
	(8590.93)	(3186.99)	(6392.79)	(7999.85)	(9608.75)	(12830.47)	(16036.22)
HYDROGRAPH AT	34	108.00	14959.	18698.	22438.	29517.	37356.
	(279.72)	(211.76)	(423.58)	(529.47)	(635.37)	(847.16)	(1058.95)
4 COMBINED	34	3425.00	227867.	283147.	342451.	457319.	572284.
	(8870.65)	(3216.82)	(6452.47)	(8074.44)	(9698.26)	(12949.82)	(16205.20)
ROUTED TO	1035	3425.00	227095.	281176.	341316.	455797.	570416.
	(8870.65)	(3205.47)	(6430.61)	(8046.94)	(9664.47)	(12906.72)	(16152.34)
HYDROGRAPH AT	35	33.00	5927.	7409.	8891.	11854.	14812.
	(85.47)	(83.92)	(167.84)	(205.79)	(251.75)	(335.67)	(419.59)
4 COMBINED	1035	3458.00	227548.	281692.	341694.	456228.	570940.
	(8556.12)	(3202.41)	(6437.76)	(8053.90)	(9675.70)	(12912.92)	(16147.27)



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DESIGN BRIEF

PROJECT NAME _____

DATE 8-21-79

SUBJECT _____

Crescent Dam #2

PROJECT NO _____

DRAWN BY JAG

Discharge - From 2 ogee crest spillways + flow over island

Dam A - Ogee crest - uncontrolled overflow

Length, $L = 900'$ Crest Elev. = 184.0

Spillway Height, $h \sim 35'$

H.W. Elev. ~ 191 :: Assume $H_d \sim 7'$

Reference: Open-Channel Hydraulics - Chow

$$C_d = 4.03$$

$$h/H_d = \frac{35}{7} = 5$$

Elev.	H_e	H_e/H_d	C/C_d	C	$Q = C L H_e^{3/2}$
184	0	0	-	-	-
186	2	0.286	0.82	3.3	8,400 cfs
188	4	.571	.92	3.71	26,710
190	6	.857	.98	3.95	52,250
192	8	1.14	1.01	4.07	82,880
194	10	1.43	1.03	4.15	116,110
196	12	1.71	1.03	4.15	155,260
198	14	2.0	1.03	4.15	195,650
200	16	2.29	1.03	4.15	239,040
202	18	2.57	1.03	4.15	285,230
204	20	2.86	1.03	4.15	334,070
206	22	3.14	1.03	4.15	385,410
208	24	3.43	1.03	4.15	439,140
210	26	3.71	1.03	4.15	495,170



PROJECT NAME _____

DATE 8-21-19

SUBJECT _____

Crescent Dam #2

PROJECT NO. _____

DRAWN BY JAG

Dam B - Ogee Crest

$L = 586'$

$h \sim 14'$

Crest ELEV = 184.0

$H_d \sim 7'$

$C_d = 4.03$

$n/H_d = \frac{14}{7} = 2.0$

ELEV.	H_d	H_d/H_d	C/C_d	C	$Q = C L H_d^{3/2}$
184	0	-	-	-	-
186	2'	0.286	0.82	3.3	5,470 cfs
188	4	.571	.92	3.71	17,390
190	6	.857	.98	3.95	34,020
192	8	1.14	1.01	4.07	53,970
194	10	1.43	1.03	4.15	76,900
196	12	1.71	1.03	4.15	101,090
198	14	2.0	1.03	4.15	127,390
200	16	2.29	1.03	4.15	155,640
202	18	2.57	1.03	4.15	185,720
204	20	2.86	1.03	4.15	217,520
206	22	3.14	1.03	4.15	250,950
208	24	3.43	1.03	4.15	285,930

Flow over Island

Estimated using Mannings equation with an effective width of 300'. $S \sim .08$ From USGS Quad
 $R \sim$ height of water. Assuming $n \sim 0.20$ due to trees etc

ELEV.	$H \sim R$	A	$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$
194	1'	300 ft ²	630 cfs
196	3	900	3940
198	5	1500	9,240
200	7	2100	16,190
202	9	2700	24,620
204	11	3300	34,390
206	13	3900	45,440



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DESIGN BRIEF

PROJECT NAME _____

DATE 8-21-79

SUBJECT _____

Crescent Dam #2

PROJECT NO. _____

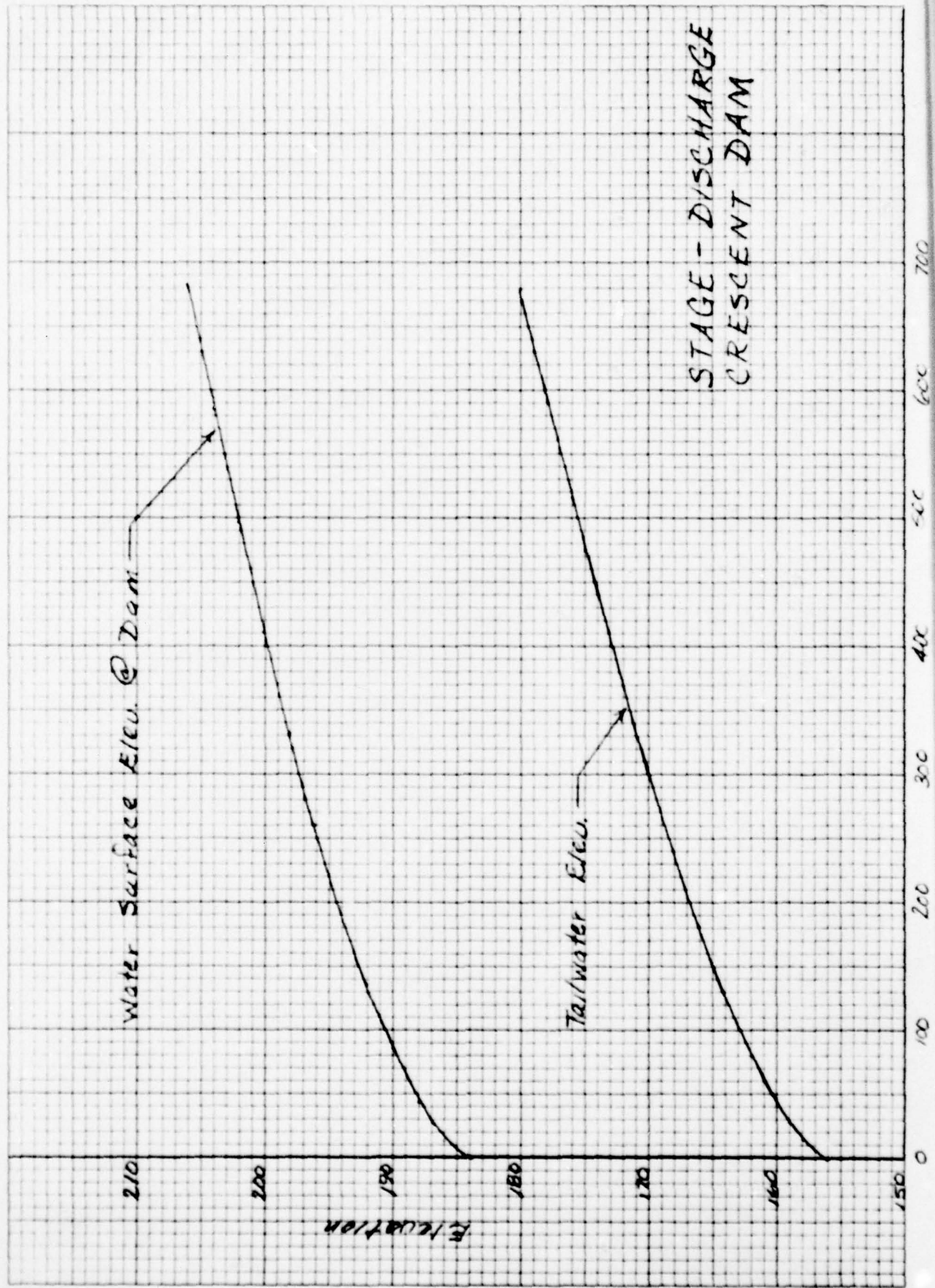
DRAWN BY JAG

Total Discharge

<u>Elev.</u>	<u>H_e (ft)</u>	<u>Q (cfs)</u>
184	0	—
186	2	13,870
188	4	44,100
190	6	86,270
192	8	136,850
194	10	195,640
196	12	260,290
198	14	332,280
200	16	410,870
202	18	495,570
204	20	585,980
206	22	681,800

NO. 340-10 DIETZGEN GRAPH PAPER
10 X 10 PER INCH

DIETZGEN CORPORATION
MADE IN U.S.A.



APPENDIX D
STABILITY ANALYSIS



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DESIGN BRIEF

PROJECT NAME CRESCENT DAM (DAM "A") -

DATE _____

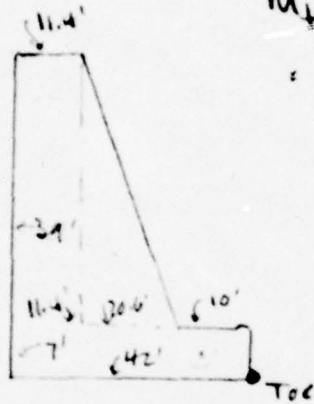
SUBJECT STABILITY COMPUTATIONS

PROJECT NO. _____

OVERTURNING & SLIDING

DRAWN BY _____

Assumed cross-section for computation:



$M_{\text{due to mass of dam}} =$

$$= (42 \times 7 \times 150) \left(\frac{42}{2}\right) + \left(\frac{1}{2} \times 20.6 \times 39 \times 15\right) \left(\frac{2 \times 20.6}{3} + 10\right)$$

$$+ (39 \times 11.4 \times 15) \left(20.6 + \frac{11.4}{2}\right) =$$

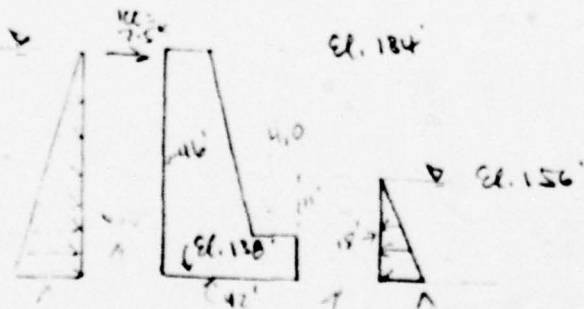
$$= 926 \text{ k} + 1430 \text{ k} + 2470.8 \text{ k} = 4777 \text{ k}$$

Wt. of dam =

$$(42 \times 7 \times 15) + \left(\frac{1}{2} \times 20.6 \times 39 \times 15\right) + (39 \times 11.4 \times 15) =$$

I. WL @ normal operating level

upst elev 154
dnt. elev 150'



$$W_1 \times 46 = 2876 \text{ k}$$

assume upst
water pressure
increases as
shown ground
surface has terminate
(conservative)

$$15 \times 62.4 = 112 \text{ ksf}$$





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Moments about toe causing overturning = \uparrow lift H_2O + \uparrow lift + ice

$$(7.87 \times \frac{46}{2} \times \frac{46}{3}) + \left[(1.12 \times 42 \times \frac{42}{2}) + (7.87 - 1.12) \left(\frac{42}{2} \times \frac{2}{3} \times 42 \right) \right] + (75' \times 42) =$$

$$= 1012'' + 988'' + 1029'' + 338'' = 3366''$$

Moments about toe resisting overturning = wt dam + ds H_2O =

$$= 4468'' + (1.12 \times \frac{15}{2} \times \frac{15}{3}) + (10 \times 11 \times 62.4 \times \frac{10}{2}) = 4872''$$

FS against overturning = $\frac{4872''}{3366''} = 1.45 \pm$

Position of resultant measured from toe of dam:

$$\underline{d} = \frac{\sum M_{toe}}{\sum V} = \frac{(4872 - 3366)''}{171 + 7 - (7.87 - 1.12) \left(\frac{42}{2} \right)} = \frac{1506}{94} = 16'$$

\underline{d} in terms of base width, $b = \frac{16}{42}(b) = 0.38(b)$

FS against sliding (friction-shear method, assuming 50 psi bond, $\mu = 0.65$)

$$= \frac{(0.65)(54'') + (0.05 \times 144 \times 42) + (1.12 \times \frac{15}{2})}{(7.87 \times \frac{46}{2}) + (7.5)} = \frac{(61 + 302 + 10)}{(66 + 7.5)} = 5.1 \pm$$



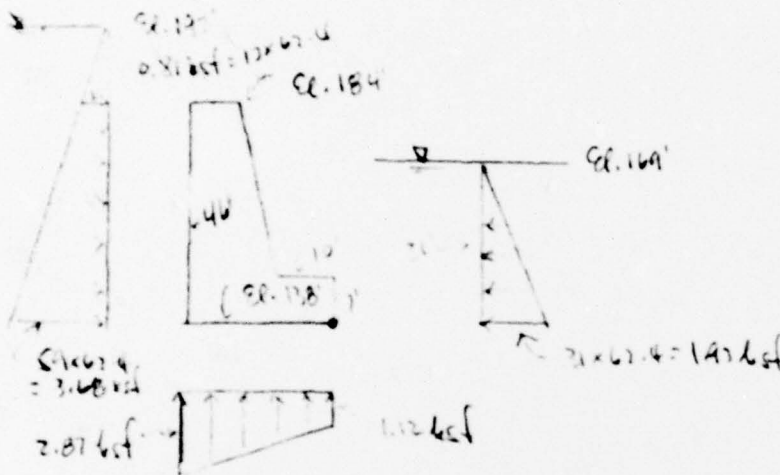
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II. WL @ PMT elevations

upst. elev 147' (12' above spill)
dst. elev 169'



assumed uplift as computed
for normal operations condition

Moments about toe causing overturning = upst. H₀ pressure + uplift =

$$= \left[(0.5 \times 46 \times \frac{46}{2}) + (368 - 0.81) \times \frac{46}{2} \times \frac{46}{3} \right] + 2017 \text{ ft} = 3886 \text{ ft}$$

Moment about toe resisting overturning = 4777 + $(1.43 \times \frac{71}{2} \times \frac{31}{2}) + (0.5 \times 10 \times 24 \times 62.4 \times \frac{10}{2})$
 neglect of H₀ at base (2017 ft)

$$\underline{FS} \text{ against overturning} = \frac{5123 \text{ ft}}{3886 \text{ ft}} = \underline{1.32}$$

Position of resultant measured from toe of dam,

$$\underline{d} = \frac{\sum M_{res}}{\sum V} = \frac{(5123 - 3886) \text{ ft}}{(171 - 84) + (5 \times 10 \times 24 \times 62.4)} = \frac{1237}{94.5} = \underline{13.0'}$$

$$\underline{d} \text{ in terms of base width, } b = \frac{13}{42} (b) = \underline{0.31 (b)}$$

Unit A



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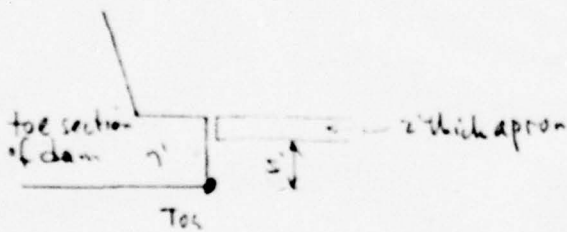
FS against sliding (friction-shear method)

$$= \frac{(0.65)(94) + (0.5 \times 100 \times 42) + (1193331)}{\frac{1}{2} (1.81 + 1.68)(46)} = \frac{61 + 302 + 30}{103} = 3.18$$

For resultant to be located at the third point of base, $d_{req'd} = 14'$.
Passive resistance by downstream apron and rock has not yet been considered but is expected to exist.

Required M_{toe} for resultant to be at $0.33(b)$ is $= (2V)(d)$
 $= (94.5')(14') = 1323'$

req'd extra moment resisting overturning $= 1323' - 1237' = 86'$



(2) for $86'$ moment about toe to be provided from bond between apron and rock, bond force req'd is $= \frac{86'}{5'} = 17' \rightarrow$ say $18'$

if bond is 50 psi, effective length of apron req'd would be $L = \frac{18'}{(1.05)(50)} = 2.5'$ (small, reasonable to expect)

also reasonable to expect similar resistance would be developed by horiz/diagonal shear in rock adjacent to toe if necessary

FS against overturning would be $= \frac{(5123 + 86)'}{3886} = 1.34 \pm$, $d = 0.33(b)$

FS against sliding would be $= \frac{61 + 302 + 30 + 18}{103} = 4+$



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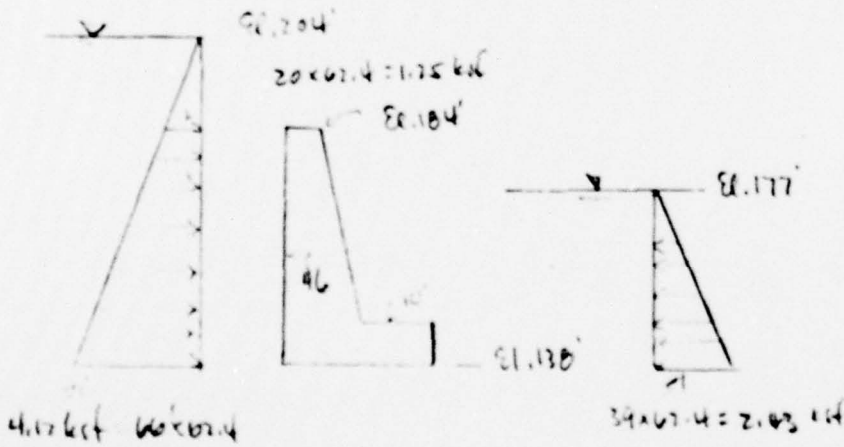
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III. WL @ PMF elevation:

upstr. elev 204' (20' above spill)
dst. elev 177'



4.12 cfs water



assumed uplift as computed for normal operations case



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Moments about toe causing overturning = from upst. H₁ & uplift

$$= \left[(1.25 \times 6.14 \times 46 \times \frac{46}{2}) + (4.12 - 1.25) \left(\frac{46}{2} \times \frac{46}{3} \right) \right] + 2017 = 4351 \text{ k}$$

Moments about toe resisting overturning = from down. upst H₁ & O

$$= 4777 + (7.43 \times \frac{29}{2} \times \frac{29}{3}) + (0.5) (10 \times 32 \times 62.4 \times \frac{10}{2}) = 5444 \text{ k}$$

$$\text{FS against overturning} = \frac{5444 \text{ k}}{4351 \text{ k}} = 1.25 \pm$$

Position of resultant measured from toe of dam

$$\underline{d} = \frac{\sum M_{toe}}{\sum V} = \frac{(5444 - 4351) \text{ k}}{171 - 84 + (5 \times 10 \times 32 \times 62.4)} = \frac{1093}{97} = 11.3'$$

$$\underline{d} \text{ in terms of base width, } b = \frac{11.3}{42} (b) = 0.27 (b)$$

FS against sliding (friction - shear method)

$$= \frac{(0.65)(171 - 84 + 9) + (0.5)(144 \times 42) + (7.43 \times \frac{29}{2})}{(1.25 + 4.12)(46)} = \frac{62 + 302 + 47}{124} = 3.3$$

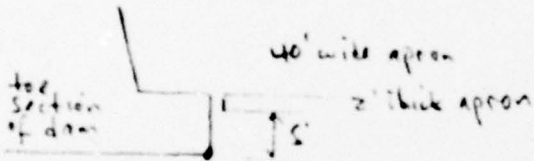


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For resultant to be located at the third point of base $d = 14'$.
 Passive resistance by downstream apron and rock has not yet
 been considered but is expected to exist.

Required M_{100} for resultant to be at $0.33(b)$ is $= (2V)(d)$
 $= (97^k)(14') = 1358^k$

req'd extra moment resisting overturning $= 1358 - 1093 = 265^k$



(a) for 265^k moment about toe to be provided from bond between apron and rock, bond force req'd is $= 265^k / 5' = 53^k$

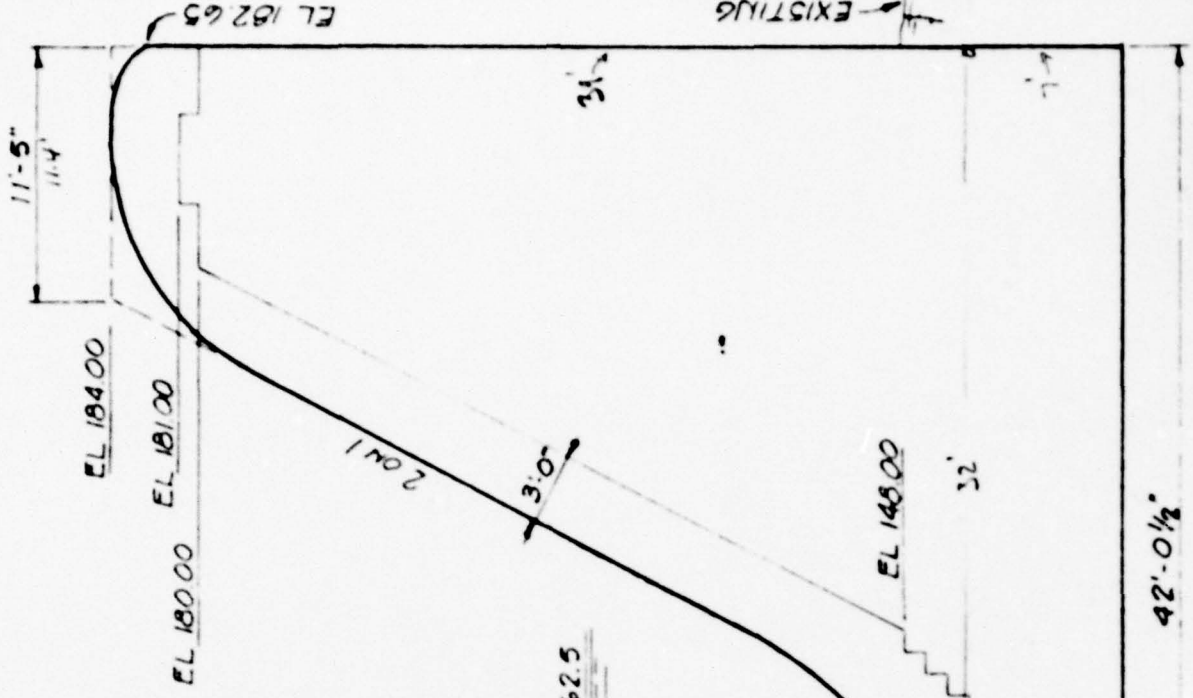
if shear is 50psi, effective length of apron req'd would be

$L = \frac{53^k}{(0.05 \times 144)} = 7.4'$ (already provided apron section does not have)

FS against overturning would be $\frac{5444 + 265}{42.51} = 1.31 +$, $d = 0.33(b)$

FS against sliding would be $= \frac{(413 + 53)^k}{124} = 3.8 +$

H.W. EL 191.0

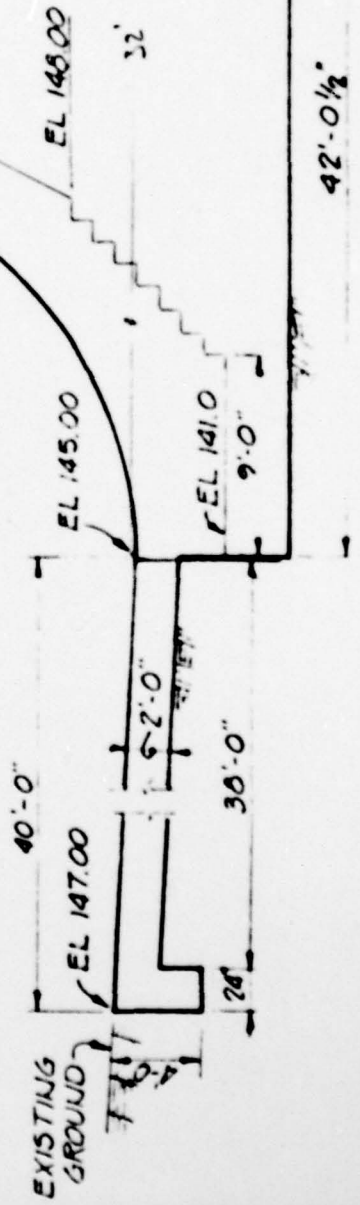


H.W. EL 162.5

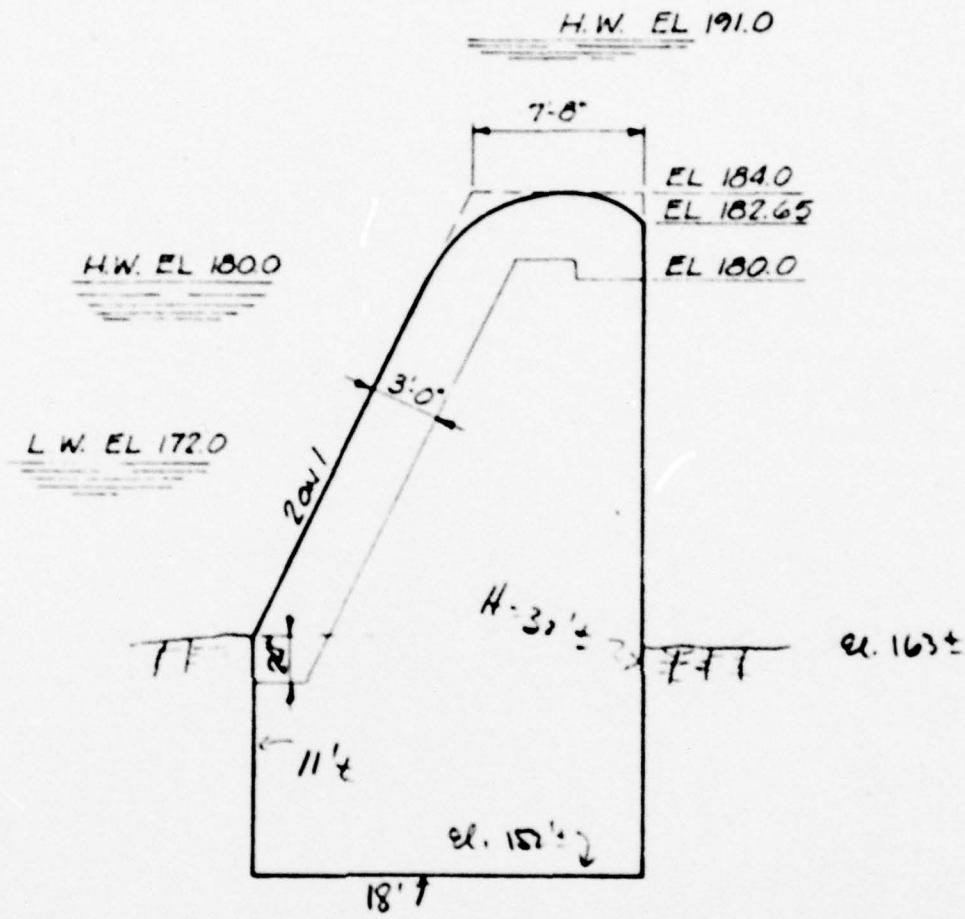
CRESCENT DAM
DAM "A"
 SCALE: 1/8" = 1'-0"

EXISTING GROUND

L.W. EL 154.00



EXISTING GROUND



CRESCENT DAM
DAM "B"
 SCALE: 1/8" = 1'-0"

184
 22
 15'



DATE 8-2-79
 JOB 2505

DRAWN JPS
 APP'D

CRESCENT DAM
 (DAM "B")



PROJECT NAME CRESCENT-DAM R

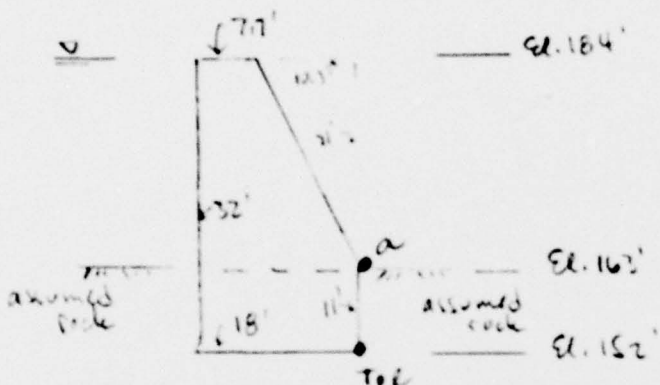
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Assumed cross-section for computations



$$M_{\text{toe}} \text{ due to mass of dam} =$$

$$= (18 \times 32 \times 15 \times \frac{15}{2}) - (\frac{1}{2} \times 10.3 \times 21 \times \frac{10.3}{3}) \times 15$$

$$Wt. \text{ dam} = (18 \times 32 \times 15) - (\frac{10.3 \times 21 \times 15}{2}) = 2000$$

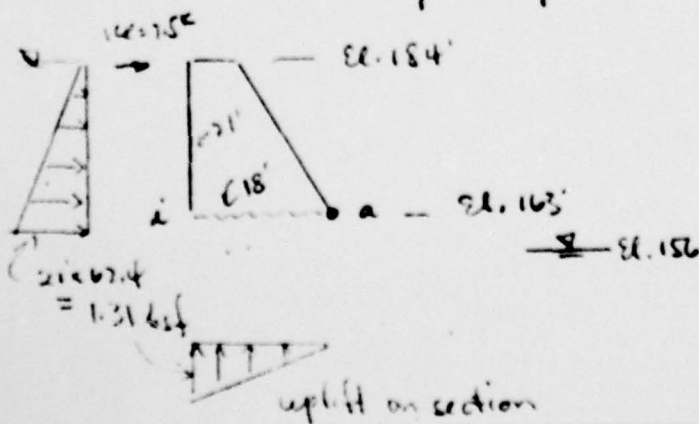
Assume shearing resistance developed in rock zones adjacent to upstream and downstream faces of dam is very great and dam cannot overturn. Analyze dam section at elevation of rock surface for resistance to overturning and sliding

$$M_a \text{ due to mass of dam above point } a =$$

$$= (21 \times 15 \times 15 \times \frac{18}{2}) - (\frac{10.3 \times 21 \times 10.3}{2} \times 15 \times \frac{10.3}{3}) = 454 \text{ ft-k}$$

$$Wt. \text{ dam section above point } a = (\frac{7.7 + 18}{2}) \times 21 \times 15 = 40.5 \text{ ft-k}$$

I. WL @ normal operating levels



11/11/11
J.D.D.



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Moment about (a) causing overturning due to upst. H₂O + uplift + ice

$$= (1.31 \times 4.5 \times \frac{21}{2} \times \frac{21}{3}) + (1.31 \times \frac{15}{2} \times \frac{2 \times 18}{3}) + (7.5 \times 20) = 388 \text{ k}$$

Moment about (a) resisting overturning = 454 k neglecting possible tensile resistance of concrete along plane a

FS against overturning = $454 / 388 = 1.17$ (low)

Position of resultant measured from (a)

$$d = \frac{\sum M_a}{\sum V_a} = \frac{(454 - 388)}{(40.5) - (1.31 \times \frac{15}{2})} = \frac{66 \text{ k}}{28.7 \text{ k}} = 2.3' \text{ from (a)}$$

(too little)

$$= 0.13(b)$$

since $b = 18'$ at section analyzed, $d_{req} = 6' \pm$

determine M_{reqd} for d to be at $\frac{1}{3}$ point of base

$$M_{req} = (2V)(d) = (28.7')(6') = 172 \text{ k}$$

$$\text{extra } M \text{ necessary} = 172 \text{ k} - 66 \text{ k} = 106 \text{ k}$$

estimate tensile strength reqd of concrete on plane a to achieve a stability condition (5 min. tensile strength in psi)

$$M_{conc} = 18' \times 144 \frac{\text{in}^2}{\text{ft}^2} \times \sigma_{conc} \times \frac{18}{2} = 106 \text{ k}$$

obtain $\sigma_{conc} = \frac{106 \text{ k} \times 1000 \frac{\text{lb}}{\text{k}}}{18' \times 144 \frac{\text{in}^2}{\text{ft}^2} \times \frac{18}{2}} = 5 \text{ psi}$

reasonable to expect if concrete in good condition

FS against overturning would be = $\frac{454 + 106}{388} = 1.44 \pm$

FS against sliding = $\frac{(0.65)(40.5 - 11.8) + (0.05 \times 144 \times 18)}{(1.31 \times \frac{15}{2}) + (7.5)} = 7 \pm$



PROJECT NAME

W.M.B.

DATE

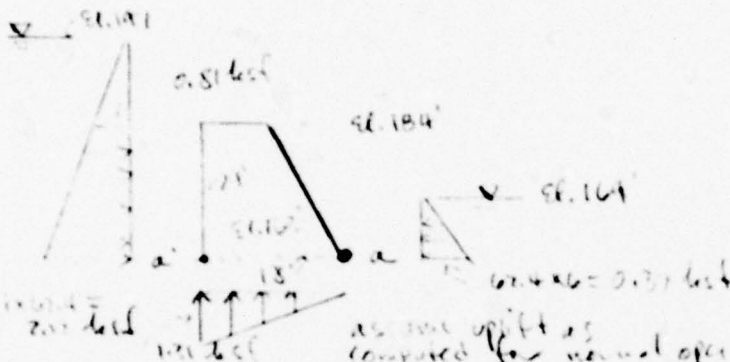
SUBJECT

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II. use $\omega = \frac{1}{2}$ PWF distributions

upst elev. 117' (12' above gelling)
dtd elev 101'



M_a resisting overturning = $454 + (0.37 \times \frac{1}{2} \times \frac{1}{2}) = 456$ neglecting possible tensile strain of concrete

M_a causing overturning = $(0.51 \times 21 \times \frac{1}{2}) + (12 \times 6 \times 6 \times \frac{21}{3} \times \frac{21}{3}) + 142 = 417$

FS against overturning = $\frac{456}{417} = 1.1$

Position of resultant, $d = \frac{\sum M_x}{\sum V} = \frac{(456 - 417)}{28.7} = 1.4$ from $a = .09(b)$

determine M_{req} for d to be $\frac{1}{3}(b)$

$M_{req} = (28.7)(d) = 28.7 \times 6 = 172$

extra M necessary = $172 - 29 = 143$

estimate tensile strength required of concrete in plane $a-a'$ to achieve a stability condition (T_{req} = tensile strength in psi)

$M_{req} = 143 \times 144 \times \frac{1}{8} = 143 \times 144 \times 1000$
 $\frac{143 \times 144}{18 \times 144} = 6$ psi

reasonable to expect if concrete in good condition

FS against overturning, $\text{becomes} = \frac{456 + 143}{417} = 1.41$ $d = 0.22(b)$

FS against sliding = $\frac{(0.65)(287) + (0.05 \times 144 \times 144) + (0.37 \times \frac{1}{2})}{(0.81 + 2.12)(21)} = 4.8$



PROJECT NAME _____

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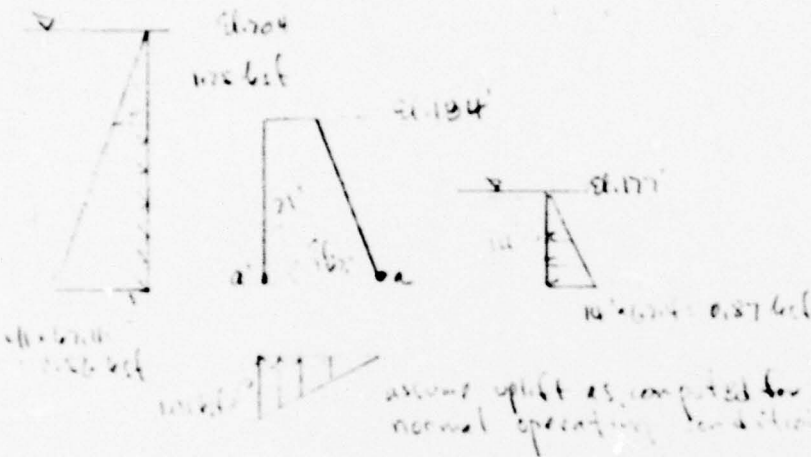
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II. W.C. to P.M.F. elevations

upst. elev 204' (20' above g.l.)
dst. elev 171'



$$M_n \text{ resisting rot} = 454 + (0.57 \times \frac{14}{2} \times \frac{14}{3}) = 482''$$

$$M_n \text{ causing overturning} = (172 \times 21) + (67.4 \times 21 \times \frac{21}{2} \times \frac{21}{3}) + 142 = 514''$$

$$FS \text{ against rot} = 482 / 514 = 0.94$$

determine M_{req} for d to be $\frac{1}{3} b$

$$M_{req} = SV \cdot d = 28.7 \times 6 = 172''$$

$$\text{net } M \text{ necessary} = 172 - 454 + 514 = 204''$$

estimate tensile strength required of conc on plane a-a to achieve a stability condition (σ_{conc} = tensile strength = psi)

$$M_{conc} = \frac{1}{2} \times 144 \times \sigma_{conc} = 204'' \times 1000''$$

$$\sigma_{conc} = \frac{204,000}{72,000} \approx 2.8 \text{ psi}$$

possible if conc in good condition

$$FS \text{ against overturning would be} = \frac{482 + 204}{514} = 1.33 \approx \underline{d = 0.33(b)}$$

$$FS \text{ against sliding} = \frac{(0.45 \times 28.7) + (172 \times 144 \times 2) + (57 \times 14)}{\frac{1}{2} (1.25 + 2.25) (71)} = \underline{4}$$

APPENDIX E

REFERENCES

APPENDIX

REFERENCES

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