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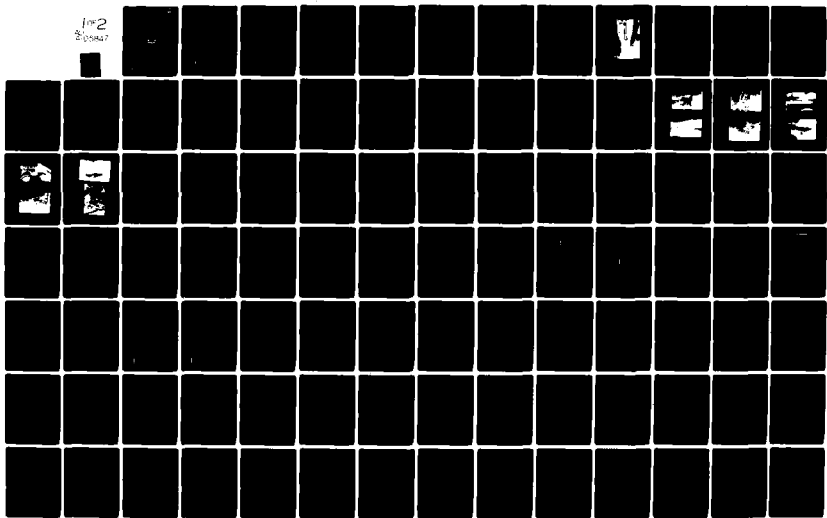
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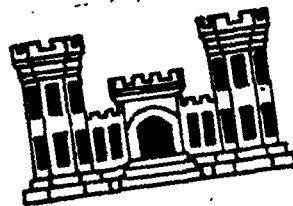
UPPER HUDSON RIVER BASIN

MECHANICVILLE RESERVOIR DAM

SARATOGA COUNTY, NEW YORK  
INVENTORY NO. N.Y. 1061

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM

AD A105847



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NEW YORK DISTRICT CORPS OF ENGINEERS  
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| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                                                    |  |
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| 1. REPORT NUMBER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER                                                                  |  |
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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br>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.<br><br>Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to life or property. However, the dam has some deficiencies which need to be evaluated and remedied. |                       |                                                                                                |  |

Using the Corps of Engineers' Screening Criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 20% of the Probable Maximum Flood (PMF) inflows. Since failure of the dam would increase the hazard to downstream residents, the spillway capacity is adjudged as 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.

Due to the severity of the spillway inadequacy, it is recommended that the stop logs on the drop inlet structure should be removed to lower the reservoir level, and to provide additional spillway capacity. The stop logs should not be replaced until appropriate mitigating measures have been taken. A system for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented. An emergency action plan for the notification and evacuation of downstream residents should also be developed and implemented.

It is recommended that within 3 months of the date of notification of the owner, a detailed hydrologic/hydraulic investigation of the structure should be commenced. Mitigating measures deemed necessary as a result of these investigations should be completed within 18 months. Stop logs should not be replaced until appropriate mitigating measures have been completed.

Inspection of the three outlet pipes revealed varying degrees of differential settlement along each of the pipes. Such settlement indicates that the pipes may have actually separated at the joints. Investigations of the differential settlement of the three pipes, should also be commenced within 3 months. Any serious problems discovered should be corrected within 12 months of the date of notification of the owner.

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## 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.

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
MECHANICVILLE RESERVOIR DAM  
I.D. NO. NY-1061  
#225A-142 UPPER HUDSON RIVER BASIN  
SARATOGA COUNTY, NEW YORK

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Phase I Inspection Report  
National Dam Safety Program

Name of Dam: Mechanicville Reservoir Dam  
(I.D. No. NY-1061)

State Located: New York

County: Saratoga

Watershed: Upper Hudson River Basin

Stream: Plum Brook

Date of Inspection: April 2, 1981

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

Using the Corps of Engineers' Screening Criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 20% of the Probable Maximum Flood (PMF) inflows. Since failure of the dam would increase the hazard to downstream residents, the spillway capacity is adjudged as 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.

Due to the severity of the spillway inadequacy, it is recommended that the stop logs on the drop inlet structure should be removed to lower the reservoir level, and to provide additional spillway capacity. The stop logs should not be replaced until appropriate mitigating measures have been taken. A system for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented. An emergency action plan for the notification and evacuation of downstream residents should also be developed and implemented.

It is recommended that within 3 months of the date of notification of the owner, a detailed hydrologic/hydraulic investigation of the structure should be commenced. Mitigating measures deemed necessary as a result of these investigations should be completed within 18 months. Stop logs should not be replaced until appropriate mitigating measures have been completed.

Inspection of the three outlet pipes revealed varying degrees of differential settlement along each of the pipes. Such settlement indicates that the pipes may have actually separated at the joints. Investigations of the differential settlement of the three pipes, should also be commenced within 3 months. Any serious problems discovered should be corrected within 12 months of the date of notification of the owner.

Several other deficiencies were noted on this structure. The worst of these deficiencies were trees and brush growing on the entire embankment. All trees and brush should be cut and removed as soon as possible to permit a detailed inspection of the embankment. The remainder of the deficiencies should be corrected within 12 months of the date of notification.

Among the actions required are the following:

1. Establishing a good grass cover on the embankment slopes;
2. Treating the soft and wet areas at the base of the downstream slope;
3. Protecting the embankment toe from erosion caused by Plum Brook main stem flow;
4. Repairing concrete on the drop inlet structure;
5. Correcting deficiencies on the laid-up stone headwall at the outlet of the spillway pipes.

George Koch RW

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New York State Department  
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Approved by:

Col. W. M. Smith, Jr.  
New York District Engineer

Date:

26 Aug 81



OVERVIEW  
MECHANICVILLE RESERVOIR DAM  
I.D. No. NY-1061

Phase I Inspection Report  
National Dam Safety Program  
Mechanicville Reservoir Dam  
I.D. No. NY-1061  
#225A-142 Upper Hudson River Basin  
Saratoga County, New York

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

- The Mechanicville Reservoir Dam is an earth dam having a drop inlet spillway containing three discharge conduits plus a smaller cast-iron standpipe leading to a water supply conduit.

The embankment is 380 feet long and about 30 feet high. The crest of the embankment is about 20 feet wide. The slopes of the embankment are somewhat variable but generally, the upstream slope is 1 vertical on 2 horizontal and the downstream slope is 1 vertical on 2.5 to 3 horizontal. There is small stone rip-rap on the lower portion of the upstream slope.

The spillway entrance consists of a concrete and masonry drop inlet structure covered with a wooden roof. The structure is square with each side about 15 feet long. There is a masonry post on each corner which supports the roof structure. Along each side are steel pins, 12 inches on center, that support 26 inches of wood stop logs. Within the structure, 30 inch diameter reinforced concrete pipe (RCP) sections form vertical risers leading to the outlet pipes. There are three risers, each consisting of three RCP sections with a vertical drop of 9 feet. The three outlet pipes are 30" diameter cast iron pipes laid in 12 foot long sections. There is a laid-up stone headwall at the outlet end of the pipes.

The outlet works standpipe consists of 16 inch cast iron pipe sections of

varying length. It has three valves which control flow into ports at three different elevations. The standpipe then leads to a 16 inch supply main. There are two brick manholes at the downstream toe of the dam, near the spillway outlet pipes. One of these contains a valve off the 16 inch supply line leading to a 16 inch blow-off line. The other manhole contains a valve regulating flow in the supply line.

b. Location

This dam is located off George Thompson Road in the Town of Stillwater. The reservoir is approximately 1.25 miles north of the hamlet of Willow Glen on New York State Route 67. The dam is approximately 2.5 miles northwest of the City of Mechanicville.

c. Size Classification

The dam is 30 feet high and has a storage capacity of 322 acre-feet. Therefore, the dam is in the small size category as defined by the "Recommended Guidelines for the Safety Inspection of Dams."

d. Hazard Classification

The dam is classified as "high" hazard due to the presence of approximately 10-15 homes in the hamlet of Willow Glen about 1.25 miles south of the dam.

e. Ownership

The dam is owned by the City of Mechanicville. It is under the jurisdiction of the city's Department of Public Works. Mr. Michael Ennello is the Commissioner of Public Works. His office is at the city garage on South Central Avenue, Mechanicville, New York 12118 and his phone number is (518) 664-7171. Mr. Vincent Barber is the Water Superintendent for the city. His phone number at the Water Treatment Plant is (518) 664-3751.

f. Purpose of Dam

This dam is used as a water supply for the City of Mechanicville. A 16 inch supply main leads from the dam to the water treatment plant in Willow Glen. This line is approximately 6100 feet long.

g. Design and Construction History

This dam was constructed in 1892. Modifications to the structure were made in 1927. At that time, a stop log structure was constructed making it possible to raise the reservoir level by about 3 feet.

h. Normal Operating Procedures

Water is withdrawn from the reservoir as required by the City. This reservoir is used as a secondary supply system. The primary source of supply is a smaller reservoir approximately one mile downstream of this dam. Therefore, the water from the Mechanicville Reservoir is used on an irregular basis, primarily during the winter months.

1.3 PERTINENT DATA

|                                           |       |
|-------------------------------------------|-------|
| a. <u>Drainage Area (sq.mi.)</u>          | 2.19  |
| b. <u>Discharge at Dam</u>                | (cfs) |
| Spillway (no stop logs) - water @ top dam | 343   |

c. Elevation (USGS Datum)

Top of Dam 268.5

Normal Pool 263

d. Reservoir - Surface Area (acres)

Top of Dam 35

Normal Pool 22

e. Storage Capacity (acre-feet)

Top of Dam 322

Normal Pool 201

f. Dam

Type - Earth embankment with small rip rap on upstream face.

Embankment length (ft) 380

Slopes (V:H) Upstream (approximate) 1 on 2  
Downstream (varies) 1 on 2.5 to 1 on 3

Crest width (ft) 20

g. Spillway - Drop Inlet

Type: Square masonry drop inlet structure with wooden roof;  
stop logs on each face; three 30 inch diameter risers leading  
to three 30 inch diameter pipes form outlet.

Length of Weir (ft) 49

h. Outlet Works - Standpipe

Type - 16 inch cast iron pipe; three valves controlling three inlet  
ports at different elevations, leads to 16 inch supply main; two  
valves at downstream toe; one leading to 16 inch blow-off line and  
one on supply line.

## SECTION 2: ENGINEERING DATA

### 2.1 GEOTECHNICAL DATA

#### a. Geology

The Mechanicville Reservoir Dam is located in the Hudson Valley physiographic province of New York State. Bedrock in the vicinity of the dam dates from the Ordovician Era (approximately 500 million years ago). Limestone, dolomite, shale and sandstone are the predominant types of rock in this area. A review of the "Brittle Structures Map of the State of New York" indicates there are no faults in the immediate vicinity of the dam.

Surficial soils in the area consist of glacial drift from the Wisconsin glaciation.

#### b. Subsurface Investigations

No records of any subsurface investigations performed in the vicinity of this structure could be located.

### 2.2 DESIGN RECORDS

There were no design records available.

### 2.3 CONSTRUCTION RECORDS

There were no construction records available for this structure. The dam was constructed in 1892. Modifications to the structure were reportedly completed in 1927.

The only information which was available was two drawings which showed plan views of the reservoir. One of these was dated 1892 and the other was dated 1924. The 1892 plan indicated that there was an auxiliary spillway channel at the left end of the dam, but this channel does not presently exist. It is not known whether it was ever built.

### 2.4 OPERATION RECORDS

No operation records are maintained on this structure.

### 2.5 EVALUATION OF DATA

Information used for the preparation of this report was obtained from the Department of Environmental Conservation files, from the City of Mechanicville files, and from measurements made at the time of the inspection. The analysis performed for this report were based primarily on field measurements taken during the visual inspection.

## SECTION 3: VISUAL INSPECTION

### 3.1 FINDINGS

#### a. General

Visual inspection of the Mechanicville Reservoir Dam was conducted on April 2, 1981. The weather was overcast with temperatures in the low fifties. The water surface at the time of inspection was 3 inches below the top of the stop logs on the spillway drop inlet (3.5 feet below the top of dam).

#### b. Embankment

Visual inspection of the embankment was hampered by trees and brush growing on both slopes and the crest. In addition to the live vegetation, there were a number of fallen trees on the downstream slope. These were reported to have been cut 10 to 15 years ago. Stumps from these trees still remain on both slopes. The resulting piles of brush made a detailed inspection impossible.

In spite of these conditions, several deficiencies were observed on this structure. The crest of the embankment was fairly level, although there were some low spots. A motor bike path had been worn along the entire length of the crest.

Several deficiencies were noted on the downstream slope. There was a soft area near the toe of the slope. This area extended for a distance approximately equal to the middle third of the embankment and was located in the middle portion of the embankment. There was one rectangular area near the right end (looking downstream) of the soft area where standing water was observed. However, there were no points of concentrated seepage. Another deficiency noted was that some bent trees were noted on the downstream slope. This could be an indication of movement of the slope. No cracks, sloughs or other indications of recent movements were noted, but the trees and brush prevented a detailed inspection of this area.

#### c. Spillway

The masonry drop inlet structure was in fair condition. There was some cracked and broken concrete on the interior of the structure (near the three wells leading to the outlet conduits). The stop logs on each side of the structure were placed in the fall of 1980 and were in good condition. There was minor leakage between the logs and some leakage under the logs as well. Some of the pins supporting these stop logs were bent. The timber roof on this drop inlet was in poor condition. Many of the roof boards were rotted or missing. The corrugated metal sheets which had covered the left side of the roof were missing. Those on the right side were bent up on the corners, although they were still in place. The vertical RCP riser leading to the outlet pipes was in satisfactory condition.

The cast iron outlet pipes at the outlet headwall have relatively the same invert elevation. However, looking back up into the pipe sections revealed varying degrees of differential settlement along each of the pipe inverts. The major changes in slope seemed to occur at pipe joints, with the most serious irregularities found inside pipe #2 (Appendix C; drawing "Spillway Outlet Structure"). Such settlement indicates that the pipes may have actually separated at the joints.

The laid-up stone headwall for the three outlet pipes was in need of repair. There were stones missing from the wall in several spots. The worst of these was a void approximately 1 foot deep by 2 feet high between the second and third outlet pipes (see photos). There was evidence of scour behind the right end of the headwall.

d. Standpipe

The standpipe appeared to be in satisfactory condition. There were two support cables leading from the standpipe and buried in the ground at either end of the dam. The three valves on the standpipe remain open at all times, but are reportedly operational.

A 16 inch supply main leads from the base of the standpipe to two brick manholes at the downstream toe of the dam. The concrete facing on the two manholes was somewhat deteriorated. A 16 inch blow-off pipe which comes out of one of the manholes appeared to be in satisfactory condition. There were several inches of sediment in the invert of this pipe. The other manhole contains a valve controlling flow in the supply line leading to the treatment plant. Both of these valves were reported to be operational.

e. Reservoir

There were no signs of instability in the reservoir area. The area surrounding the reservoir was forested up to the water surface. The slopes rising from the reservoir were relatively steep, especially along the western side.

f. Downstream Channel

The outlet channel was in satisfactory condition. The Plum Brook main-stem flows near the downstream toe of the embankment at the right end of the dam. The brook takes a right angle bend away from the dam near the midpoint of the embankment. There was some evidence of scour on the outside of the bend. The scoured area was beginning to infringe on the toe of the embankment.

### 3.2 EVALUATION OF OBSERVATIONS

Visual inspection revealed several deficiencies on this structure. The following items were noted:

1. Trees and brush growing on the entire embankment, making a detailed inspection impossible.
2. A soft area at the downstream toe of the slope, and, at one end of this soft area, a rectangular wet area.
3. Differential settlement of the three spillway pipes at their outlet.
4. Bent trees on the downstream slope which are possible indications of movement of the slope.
5. Missing stones and other deficiencies on the laid-up stone headwall at the outlet of the spillway pipes.
6. Deterioration of the timber roof on the drop inlet structure.
7. Scour from Plum Brook which was impinging on the downstream toe of the embankment.
8. A motor bike path which had been worn into the crest.
9. Minor cracking and deterioration of concrete on the drop inlet structure.
10. Minor deterioration on the two manholes on the 16 inch supply line.

#### SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

##### 4.1 PROCEDURES

There are no prescribed operating procedures for this dam. This reservoir is used as a back-up water supply for the City of Mechanicville. Water is withdrawn from the reservoir when required.

##### 4.2 MAINTENANCE OF DAM

There is no established maintenance plan for this dam.

##### 4.3 WARNING SYSTEM IN EFFECT

No apparent warning system for evacuation of downstream resident is present.

##### 4.4 EVALUATION

The operation of this reservoir is satisfactory. The maintenance of the dam has been unsatisfactory. Increased maintenance efforts are required to correct deficiencies noted in Section 3.

## SECTION 5: HYDROLOGIC/HYDRAULIC

### 5.1 DRAINAGE AREA CHARACTERISTICS

The delineation of the contributing watershed to this dam is indicated on the map titled "Drainage Area Map - Mechanicville Reservoir Dam" (Appendix C). The irregular but somewhat rectangular-shaped, north-south oriented watershed of some 2.19 square miles (1400 acres) is comprised of relatively undeveloped lands consisting of primarily forest and some open fields. The forest, within the watershed, is part of the larger 6800 acre Luther Forest area. Bank slopes along the primary drainage paths are moderate to steep due to erosion and downcutting of the surficial sandy soils. Slopes beyond the banks of the drainageways are moderate to flat. Elevations along the hills forming the watershed divide range from 70 to 140 feet above the reservoir. Adjacent and partly within the upper reaches of the watershed is a sizeable wetland located east of Black Pond. There are no other significant size bodies of water nor are there any known flow diversions either into or out of the watershed.

### 5.2 ANALYSIS CRITERIA

No hydrologic/hydraulic information was available regarding the original design for this dam. Therefore, the analysis of the floodwater retarding capability of the dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. The computer program develops an inflow hydrograph using the "Snyder Unit Hydrograph" method and then reservoir routs the hydrograph using the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the Probable Maximum Flood (PMF), in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers. The PMF event is that hypothetical storm event resulting from the most critical combination of rainfall, minimum soil retention, and direct runoff to a specific site that is considered reasonably possible for a particular watershed. Precipitation values used in the analysis were obtained from the Weather Bureau publication HMR 33. Soil retention rates selected were an initial loss of 1.0 inches and a constant loss of 0.2 inches per hour. These rates were used because of the highly permeable soils located throughout the entire watershed.

### 5.3 SPILLWAY CAPACITY

The single, square, drop inlet spillway has a concrete crest and three, 30 inch diameter, vertical concrete risers leading to the outlet pipes. Entirely surrounding the four-sided crest are 26 inch high stoplogs. Some additional outflows are possible via the vertical standpipe. However, for the floodwater analysis, the discharges through the standpipe outlet works were not included. The single spillway was analyzed with no stoplogs in place. For low head condition, the spillway discharges were computed using a weir flow discharge coefficient,  $C$ , of 3.2. As reservoir levels rise, discharge becomes limited by the capacity of the three outlet pipe conduits. The computed discharge capacity of the spillway without stoplogs in-place is 343 cfs.

The flood analysis performed for this dam indicates that the spillway does not have sufficient capacity for discharging one-half the PMF. For this storm event, the peak inflow and the peak outflow is 1587 cfs. The PMF peak inflow and peak outflow is 3171 cfs.

5.4 RESERVOIR CAPACITY

The normal water surface varies because of water supply withdrawals which are dependent upon consumer demand. Maximum normal pool is at or near the top of the stoplogs, (elevation 265.2) . Water supply withdrawals via the standpipe openings may lower the pool to about the reservoir bottom, providing the outflow capacity exceeds the inflows from watershed runoff.

The impounded capacity at the spillway crest (elevation 263-USGS) is 201 acre-feet. Surge storage capacity to the top-of-dam (elev. 268.5) adds 121 acre-feet which is equivalent to a direct runoff depth of 1.04 inches over the watershed. The total storage capacity is 322 acre-feet.

5.5 FLOODS OF RECORD

The date of occurrence of the maximum flood at the dam site is not known.

5.6 OVERTOPPING POTENTIAL

Analyses using the PMF and one-half the PMF storm events indicates that the spillway does not have sufficient discharge capacity. The computed depths of overtopping for these two events are 1.99 feet and 1.15 feet respectively. All storm events exceeding 20% of the PMF will result in the dam being overtopped.

5.7 EVALUATION

The spillway capacity is inadequate for the peak outflow from one-half the PMF. Overtopping of the earth embankment is likely to cause dam failure. Therefore, a dam-break analysis, assuming a breaching of the dam, was performed. The analysis indicates that water surface levels downstream of the dam near the hamlet of Willow Glen could reach depths which would pose a significant danger to residents. That is, dam failure resulting from overtopping would significantly increase the hazard to loss of life downstream from the dam from that which would exist just before an overtopping failure. Therefore, the spillway is adjudged as "seriously inadequate" and the dam is assessed as "unsafe, non-emergency".

## SECTION 6: STRUCTURAL STABILITY

### 6.1 EVALUATION OF STRUCTURAL STABILITY

#### a. Visual Observations

Visual observations of the structure were limited by the trees and brush growing on the dam. However, there were several deficiencies noted. A soft area was noted near the downstream toe which extended along the middle third of the embankment. There was a rectangular wet area near the right end of this soft section. Standing water was observed in this area, but there were no points of concentrated seepage. Some bent trees were noted on the downstream slope. While no cracks or slough were noted, these trees could be an indication of slope movements.

#### b. Design and Construction Data

No information was available concerning the original design or construction of this dam. One plan sheet from 1892 was available, but it indicated that an auxiliary spillway channel was to be constructed at the left end of the dam. No such spillway channel presently exists.

#### c. Seismic Stability

This dam is located in Seismic Zone 2. No seismic stability analysis was performed on this structure.

## SECTION 7: ASSESSMENT/RECOMMENDATIONS

### 7.1 ASSESSMENT

#### a. Safety

The Phase I inspection of the Mechanicville Reservoir Dam revealed that the spillway is seriously inadequate and outflows from all storms exceeding 20% of the Probable Maximum Flood would overtop the dam. Since an overtopping induced failure would significantly increase the hazard to downstream residents, the dam is assessed as unsafe-non-emergency.

In addition to the spillway inadequacy, other deficiencies were noted which affect the safety of this structure. Among the deficiencies observed were differential settlement of the three spillway pipes at their outlet end, a soft area at the downstream toe of the slope, scour from Plum Brook impinging on the downstream toe of the embankment and bent trees on the downstream slope indicating possible slope movements.

#### b. Adequacy of Information

The information which was available for the preparation of this report was extremely limited. Sketches developed from field measurements taken at the time of the inspection were used to determine the discharge capacity of the spillway.

#### c. Need for Additional Investigations

Since the spillway has been assessed as seriously inadequate, additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. Analysis will then be required to determine appropriate mitigating measures in response to the seriously inadequate spillway capacity.

Also, the extent of the differential settlement within the spillway pipes should be determined and monitored. This investigation should be conducted in conjunction with determining any movement of the downstream slope.

#### d. Urgency

The additional hydrologic/hydraulic investigations which are needed should be commenced within 3 months of the date of notification of the owner, and the mitigating measures deemed necessary as a result of the investigation should be completed within 18 months of the date of notification. The investigations of the differential settlement problem as well as the possible movement of the downstream slope should also be commenced within 3 months of the date of notification. Any serious problems discovered and/or any worsening of either condition should receive prompt remedial action. All other deficiencies should be corrected within 12 months of the date of notification.

## 7.2 RECOMMENDED MEASURES

- a. Due to the serious deficiency in spillway capacity, remove the stop logs and lower the reservoir level pending the results of the detailed hydrologic/hydraulic analysis.
- b. After the hydrologic/hydraulic investigation has been completed, mitigating measures dealing with the seriously inadequate spillway capacity should be undertaken.
- c. As a result of the investigation relating to the differential settlement of the spillway outlet pipes, and possible movement of the downstream embankment slope, remedial measures should be undertaken.
- d. Trees and brush growing on the embankment should be cut and the slope cleared as soon as possible. Upon completion of the clearing, a detailed inspection of the embankment should be conducted.
- e. After the embankment is cleared, a good grass cover should be established to provide erosion protection.
- f. The soft and wet areas near the downstream toe should be treated in an appropriate manner to permit the water to drain without disturbing the soil particles which form the slope.
- g. Actions should be taken which will protect the toe of the embankment from scour caused by Plum Brook.
- h. The cracking and deterioration of concrete on the drop inlet structure should be repaired.
- i. Missing stones and other deficiencies on the laid-up stone head-wall at the outlet of the principal spillway pipes should be repaired.
- j. An emergency action plan for the notification of downstream residents should be developed and implemented.

APPENDIX A

PHOTOGRAPHS



Embankment Crest; Note Brush Growing on Dam



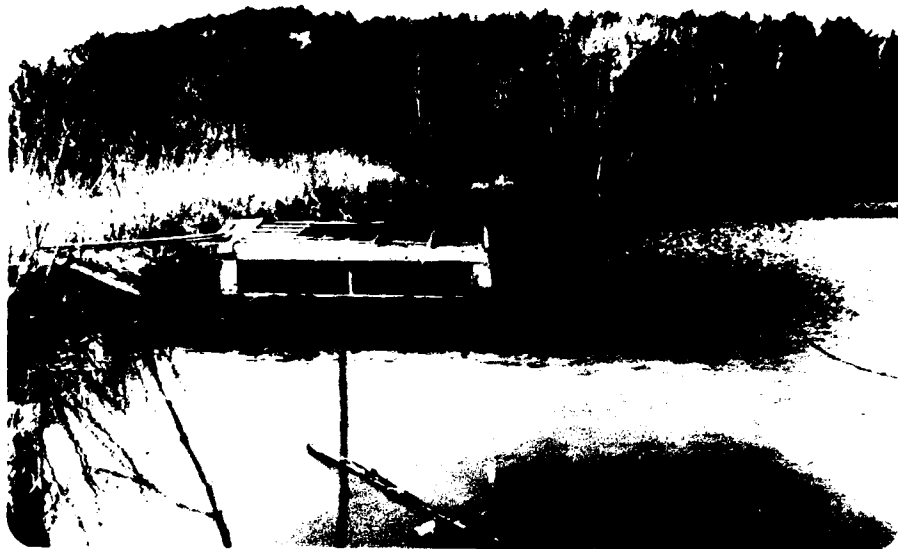
Upstream Slope of the Embankment



Downstream Slope of Embankment; Note  
Trees and Brush Growing on Slope



Downstream Slope; Note Bent Trees indicating  
Possible Past Movement of Slope



Concrete Drop Inlet Structure with  
Timber Roof; Cast Iron Standpipe in Background



Drop Inlet Structure; Note Stop Logs in Place  
on all Sides.



Three Wells within Drop Inlet Structure  
Leading to Spillway Outlet Pipes; Note  
Cracked Concrete



Spillway Outlet Pipes and Manholes  
Containing Valves on 16 inch Supply Main



Stream Which Flows Near Downstream Toe of Embankment



Wet Area at Downstream Toe of the Embankment

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam MECHANICVILLE RESERVOIR DAM  
Fed. I.D. # NY-1061 DEC Dam No. 225A-142  
River Basin UPPER HUDSON  
Location: Town STILLWATER County SARATOGA  
Stream Name \_\_\_\_\_  
Tributary of PLUMB BROOK  
Latitude (N) 42°56.3' Longitude (W) 73°43.9'  
Type of Dam EARTH EMBANKMENT  
Hazard Category HIGH  
Date(s) of Inspection 4/2/81  
Weather Conditions 50° OVERCAST  
Reservoir Level at Time of Inspection 3.5' BELOW TOP OF DAM

b. Inspection Personnel R. WARRENDER W. LYNICK

c. Persons Contacted (Including Address & Phone No.) \_\_\_\_\_  
VINCE BARBER, WATER SUPERINTENDENT (518) 664-3751  
MICHAEL ENNELLO, COMMISSIONER OF PUBLIC WORKS  
(518) 664-7171

d. History:

Date Constructed 1892 Date(s) Reconstructed 1927

Designer \_\_\_\_\_

Constructed By \_\_\_\_\_

Owner CITY OF MECHANICVILLE

2) Embankment

a. Characteristics

- (1) Embankment Material UNKNOWN
- (2) Cutoff Type ~~Form~~ UNKNOWN
- (3) Impervious Core POSSIBLY HAS CONCRETE CORE WALL, BUT PLANS DON'T SHOW IT & NO EVIDENCE IN FIELD
- (4) Internal Drainage System NONE
- (5) Miscellaneous \_\_\_\_\_

b. Crest

- (1) Vertical Alignment SOMEWHAT UNEVEN - OCCASSIONAL LOW SPOTS
- (2) Horizontal Alignment SATISFACTORY
- Surface Cracks NONE NOTED
- (4) Miscellaneous BIKE PATH RUNS LENGTH OF CREST - SUBSTANTIAL BRUSH ON EITHER SIDE OF PATH

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1 ON 2 - SOMEWHAT VARIABLE
- (2) Undesirable Growth or Debris, Animal Burrows SUBSTANTIAL BRUSH COVER - STUMPS FROM OLD TREES
- (3) Sloughing, Subsidence or Depressions NONE NOTED

(4) Slope Protection SMALL RIPRAP ON LOWER PART OF SLOPE

(5) Surface Cracks or Movement at Toe UN OBSERVABLE

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 ON 2.5 TO 1 ON 3

(2) Undesirable Growth or Debris, Animal Burrows COVERED WITH BRUSH & TREES - LOTS OF BRUSH & CUT TREES FROM PREVIOUS CUTTING

(3) Sloughing, Subsidence or Depressions NO CRACKS OBSERVED BUT THERE WERE SOME BENT TREES ON SLOPE INDICATING PRIOR MOVEMENTS

(4) Surface Cracks or Movement at Toe NONE OBSERVED BUT BRUSH AND TREES PREVENTED CLOSE INSPECTION

(5) Seepage ONE SOFT AREA EXTENDED ALONG TOE IN ABOUT MIDDLE THIRD OF DAM - AT ONE END OF THIS WET AREA THERE WAS A RECTANGULAR WET AREA ABOUT 10' X 20'. GROUND SOFT & SOME STANDING WATER OBSERVED. AREA WAS AT RIGHT END OF WET AREA.

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

NO ACTUAL SEEPAGE OBSERVED

(7) Condition Around Outlet Structure SOME SCOUR ON RIGHT END OF SPILLWAY HEADWALL

(8) Seepage Beyond Toe WET AREA NOTED ABOVE

e. Abutments - Embankment Contact

RIGHT ABUTMENT VERY STEEP

LEFT ABUTMENT FAIRLY STEEP

(1) Erosion at Contact NONE

(2) Seepage Along Contact NONE

3) Drainage System

a. Description of System NONE

b. Condition of System \_\_\_\_\_

c. Discharge from Drainage System \_\_\_\_\_

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) \_\_\_\_\_

NONE

5) Reservoir

- a. Slopes FAIRLY STEEP SLOPES - ESPECIALLY ON RIGHT BANK
- b. Sedimentation NONE NOTED
- c. Unusual Conditions Which Affect Dam PLANNED HOUSING DEVELOPMENT WILL COVER LARGE PART OF WATERSHED

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) 10-15 HOUSES IN WILLOW GLEN; LOWER RESERVOIR & WATER TREATMENT PLANT; STATE HIGHWAY
- b. Seepage, Unusual Growth NONE
- c. Evidence of Movement Beyond Toe of Dam SOME SCOUR ON BEND IN PLUM BROOK - STARTING TO IMPINGE ON TOE OF EMBANKMENT
- d. Condition of Downstream Channel PLUM BROOK RUNS NEAR TOE OF EMBANKMENT & THEN BENDS AWAY.

7) Spillway(s) (Including Discharge Conveyance Channel)

- DROP INLET WITH 3 OUTLET PIPES  
STAND PIPE WITH 16" OUTLET PIPE
- a. General DROP INLET PASSES NORMAL FLOWS & PUTS WATER INTO PLUM BROOK; STAND PIPE HAS THREE INLET PORTS - VALVES ALWAYS OPENED - LEADS TO 16 INCH SUPPLY LINE  
AUX. SPILLWAY CHANNEL SHOWN ON PLANS DOES NOT EXIST
  - b. Condition of Service Spillway DROP INLET STRUCTURE IN FAIRLY GOOD CONDITION. SOME CRACKED & BROKEN CONCRETE ON CREST ALONG ENTIRE EMBANKMENT SIDE EDGE - OTHER 3 SIDES ARE OKAY - SOME CRACKED CONCRETE ON INLET FLOOR AS WELL - WELL PITS & UPSTREAM PART OF PIPES LOOK OKAY. FLASHBOARDS ON SIDES WERE INSTALLED IN FALL, 1980  
SOME LEAKAGE BETWEEN BOARDS & UNDER THEM AT MASONRY JOINTS BUT OTHERWISE IN GOOD CONDITION  
SOME OF PINS ~~ARE~~ HOLDING BOARDS WERE BENT

TIMBER ROOF ON DROP INLET IN STATE OF DISREPAIR. ROOF  
BOARDS ROTTEN & SOME COMPLETELY GONE. CORRUGATED METAL ROOF  
GONE ON LEFT SIDE; BENT UP ON RIGHT.

OUTLET PIPES - 3 PIPES ON VARYING SLOPES. SOME MINOR  
DISPLACEMENT OF JOINTS NOTED

HEADWALL - LAID UP STONE - SOME STONES MISSING - 1' deep  
BY 2' HIGH VOID BETWEEN PIPES 2 & 3 - SOME SCOUR (REMOVED  
BACKFILL) ADJACENT TO RIGHT SIDE

c. Standpipe Spillway STANDPIPE OUT IN RESERVOIR - 2 CABLES  
LEADING TO SHORE SUPPORT IT. THREE <sup>REPORTEDLY OPERABLE</sup> VALVES AT DIFFERENT  
ELEVATIONS CONTROL FLOW INTO PIPE. 16" LINE LEADS TO  
2 MANHOLES AT DOWNSTREAM TOE - BOTH BRICK MANHOLES WITH

SOME DETERIORATION - FIRST ON HAS VALVE FOR 16" BLOWOFF PIPE

OTHER HAS VALVE FOR SUPPLY PIPE  
d. Condition of Discharge Conveyance channel STEEP SIDE SLOPES

SOME DEBRIS IN CHANNEL

#### 8/Reservoir Drain/Outlet

STAND PIPE CAN SERVE THIS FUNCTION - ALTHOUGH  
ELEVATION OF LOWEST OPENING IS UNKNOWN

#### 9/Operation Procedures

NO SPECIAL OPERATION PROCEDURES.

#### 10/APPURTENANT STRUCTURES

NONE

#### 11/STRUCTURAL

DESCRIPTION PROVIDED IN SPILLWAY SECTION

APPENDIX C

HYDROLOGIC/HYDRAULIC  
ENGINEERING DATA AND COMPUTATIONS

MECHANICVILLE  
RESV. DAM  
NY-1061

1

CHECK LIST FOR DAMS  
HYDROLOGIC AND HYDRAULIC  
ENGINEERING DATA

AREA-CAPACITY DATA:

|                                            | (USGS DATUM)<br><u>Elevation</u><br>(ft.) | <u>Surface Area</u><br>(acres) | <u>Storage Capacity</u><br>(acre-ft.) |
|--------------------------------------------|-------------------------------------------|--------------------------------|---------------------------------------|
| 1) Top of Dam                              | <u>268.5</u>                              | <u>35</u>                      | <u>322</u>                            |
| 2) Design High Water<br>(Max. Design Pool) | <u>NA</u>                                 | <u>          </u>              | <u>          </u>                     |
| 3) Auxiliary Spillway<br>Crest             | <u>NA</u>                                 | <u>          </u>              | <u>          </u>                     |
| 4) Pool Level with<br>Flashboards          | <u>265.2</u>                              | <u>          </u>              | <u>          </u>                     |
| 5) Service Spillway<br>Crest               | <u>263.0</u>                              | <u>22</u>                      | <u>201</u>                            |

DISCHARGES

|                                                   | <u>Volume</u><br>(cfs) |
|---------------------------------------------------|------------------------|
| 1) Average Daily                                  | <u>N/A</u>             |
| 2) Spillway @ Maximum High Water (NO STOPLOGS)    | <u>343</u>             |
| 3) Spillway @ Design High Water                   | <u>N/A</u>             |
| 4) Spillway @ Auxiliary Spillway Crest Elevation  | <u>N/A</u>             |
| 5) Low Level Outlet (STANDPIPE - 3 OUTLETS)       | <u>UNKNOWN</u>         |
| 6) Total (of all facilities) @ Maximum High Water | <u>± 350</u>           |
| 7) Maximum Known Flood                            | <u>UNKNOWN</u>         |
| 8) At Time of Inspection                          | <u>N/A</u>             |

MECHANICVILLE  
RESV. DAM  
NY-1061 2

CREST:

(USGS)

ELEVATION: 268.5

Type: EARTH w/ VEGETATIVE COVER + BRUSH & TREES

Width: 20' Length: 380'

Spillover N/A

Location N/A

SPILLWAY:

SERVICE

AUXILIARY

263

(CREST)

Elevation

12' SQUARE WEIR w/ 3  
VERTICAL 30" DIA. DROP INLETS  
12"

Type

NONE

Width

Type of Control

Uncontrolled

Controlled:

✓  
2.2' HIGH WOODEN STOPLOGS  
ALL AROUND

Type

(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length  
of operating service

Chute Length

Height Between Spillway Crest  
& Approach Channel Invert  
(Weir Flow)

N/A

> 1'

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: \_\_\_\_\_

Records:

Date - \_\_\_\_\_

Max. Reading - \_\_\_\_\_

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

NONE 3 WITHDRAWAL OPENINGS IN STANDPIPE ARE OPEN  
(GRAVITY FLOW TO WATER TREATMENT PLANT)

DRAINAGE AREA: 1400 ACRES 2.19 SQ. MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FOREST & OPEN FIELDS  
Terrain - Relief: HILLY ; SLOPES MODERATE ; LARGE WETLANDS @ HEADWATERS  
Surface - Soil: PERMEABLE SANDS & GRAVELS

Runoff Potential (existing or planned extensive alterations to existing  
(surface or subsurface conditions)

LUTHER FOREST DEVELOPMENT (SECTION II - AFTER 1985)

Potential Sedimentation problem areas (natural or man-made; present or future)

SOILS ARE SUBJECT TO EROSION ; WITH TIME, RESERVOIR AREA  
NEAR ELMOR ROBINSON ROAD COULD BECOME SEDIMENT-FILLED

Potential Backwater problem areas for levels at maximum storage capacity  
including surcharge storage:

NONE APPARENT ; ELMOR ROBINSON ROAD ELEV.  $\approx$  TOP OF DAM  
ELEV.

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the  
Reservoir perimeter:

Location: NONE APPARENT

Elevation: \_\_\_\_\_

Reservoir:

Length @ Maximum Pool ± 0.6 (Miles)

Length of Shoreline (@ Spillway Crest) ± 1.5 (Miles)

PROJECT GRID

|         |                                 |           |    |             |     |      |         |
|---------|---------------------------------|-----------|----|-------------|-----|------|---------|
| JOB     | MECHANICVILLE RESERVOIR NY-1061 | SHEET NO. | 1/ | CHECKED BY  |     | DATE |         |
| SUBJECT | WATERSHED PARAMETERS            |           |    | COMPUTED BY | WCL | DATE | 4/17/81 |

DRAINAGE AREA : USGS 7.5 MIN QUAD FOR MECHANICVILLE NY  
SCALE: 1" = 2000'  
1 SQ IN = 91.827 ACRES

DR AREA = 1400 ACRES ← 15.25 SQ IN  
DA = 2.19 SQ MILES

SNYDER UNIT HYDROGRAPH PARAMETERS :

LAG TIME :  $t_p = \frac{C}{L} (L \times L)^{0.3}$   $C = 2.5$  (INCREASED  $C$  SLIGHTLY to account for upland storage)  
 $L = 2.98 \text{ MILES} = 15750'$   
 $L_{CA} = 1.18 \text{ MILES} = 6250'$

$t_p = (2.5)(2.98 \times 1.18)^{0.3} = 3.65 \text{ HRS}$

UNIT RAINFALL DURATION :  $t_r = \frac{t_p}{5.5}$   
 $t_r = 0.66 \text{ HRS}$  USE  $t_r = 0.5 \text{ HRS}$  ←

ADJUSTED LAG :  $TP = t_p + 0.25(t_r - t_p)$   
 $TP = 3.65 + 0.25(0.5 - 0.66)$   
 $TP = 3.61 \text{ HRS}$  ←

PEAKING COEFFICIENT :

GAO CP = 400  
CP = 0.625 ←

PROJECT GRID

|                                 |                 |                    |                 |
|---------------------------------|-----------------|--------------------|-----------------|
| JOB<br>MECHANICVILLE RESV.      | SHEET NO.<br>2/ | CHECKED BY         | DATE            |
| SUBJECT<br>WATERSHED PARAMETERS |                 | COMPUTED BY<br>WCL | DATE<br>4/20/81 |

|                              |              |                                         |
|------------------------------|--------------|-----------------------------------------|
| PMP - RAINFALL :             | HRR # 33     |                                         |
| INDEX PRECIPITATION = 19"    |              |                                         |
| (1200 SQ MI / 24 HR)         |              |                                         |
|                              | HRS →        | 6      12      24      48               |
| @ N 42° 57' }<br>W 73° 43' } | ZONE #1      | LOWER LIMIT }<br>OF D-A-D }<br>CURVES } |
|                              | % OF INDEX = | 111      123      132      142 ←        |

SOIL INFILTRATION - PRECIP. LOSS RATES:

| SOIL TYPES : SANDS & GRAVELS |           |                              |              |
|------------------------------|-----------|------------------------------|--------------|
| SOIL NAME                    | SCS GROUP | INFILTRATION RATES<br>INS/HR | RATES<br>TYP |
| COLONIE                      | A         | 0.3 - 0.45                   | 0.4          |
| HOOSIC                       | A         | 0.3 - 0.45                   | 0.4          |
| HUDSON                       | C         | 0.08 - 0.15                  | 0.1          |

1.0 INS - INITIAL
0.2 INS - CONSTANT
USE
USE

BASE FLOW:

FROM USGS GAGE DATA FOR ANTHONY KILL (INCLUDES PLUM BROOK)  
#01335700 WATERSHED

|          |                             |             |  |
|----------|-----------------------------|-------------|--|
| BULL #74 | AVE OF 16 READINGS          | CSM = 13.45 |  |
|          | AVE OF 14 "                 | = 6.67      |  |
|          | (DELETE 210 & 213 READINGS) |             |  |

6 cfs / SQ MI
USE

|         |      |
|---------|------|
| QRCSN = | -0.1 |
| RTIOR = | 1.5  |

←
←

PROJECT GRID

|                                         |                 |                    |                 |
|-----------------------------------------|-----------------|--------------------|-----------------|
| JOB<br>MECHANICVILLE RESV.              | SHEET NO.<br>3/ | CHECKED BY         | DATE            |
| SUBJECT<br>ELEVATION - STORAGE CAPACITY |                 | COMPUTED BY<br>WCL | DATE<br>4/20/81 |

FROM 200 SCALE RESV. MAPPING

1 SQ. IN. = 0.91827 ACRES

PLANIMETERED @ 13.09

10.86

NORMAL POOL : 23.95 SQ. INS. → 22 ACRES ← ELEV. @ 263

(ASSUMED POOL = SPILLWAY CREST)

HEIGHT OF DAM (EMBANKMENT) ESTIMATED @ 25' +

STANDPIPE HEIGHT REPORTED AS 33' - BOTTOM RESV. ELEV.

TOP OF EMBANKMENT TO SPILLWAY CREST ≈ 5.5' ← @ 268.5

∴ CONIC VOLUME =  $\frac{1}{3} Ah = \frac{(22)(27.5)}{3} = 201 \text{ AC-FT}$  @ NORMAL POOL

VOLUME : ABOVE NORMAL POOL =  $22(5.5) = 121 \text{ AC-FT} = \Delta V$  (TO TOP DAM)

TOP OF DAM: VOL = 322 AC-FT

REPORTED VOLUME ≈ 135 MILLION GALS. → 44.1 AC-FT

USGS

USE

| JOB                                            | SHEET NO.   | CHECKED BY   | DATE    |
|------------------------------------------------|-------------|--------------|---------|
| MECHANICVILLE RESV.                            | 4/          |              |         |
| SUBJECT                                        | COMPUTED BY |              | DATE    |
| SPILLWAY DISCHARGES - ANALYSIS DATA            | WCL         |              | 4/23/81 |
| SPILLWAY DIMENSIONS :                          |             | TOTAL LENGTH |         |
| OUTER PERIMETER @ 14.9' EACH SIDE              |             | 59.6'        |         |
| STOPLOG LENGTH @ 12.9' EACH SIDE               |             | 51.6'        |         |
| 12 - 1" Ø PINS / SIDE = 1' EACH SIDE           |             |              |         |
| STOPLOG LENGTH (NET)                           |             | 47.6'        | WEIR    |
| 4 PIERS = MASONRY CORNER POST ( $K_p = 0.09$ ) |             |              |         |
| SPILLWAY CREST @ 12.25' EACH SIDE              |             | 49'          | WEIR    |
| FLOW CONDITIONS :                              |             | CALC. SHT. # |         |
| WEIR FLOW OVER STOPLOGS                        |             | 9            |         |
| WEIR FLOW OVER SPILLWAY - NO STOPLOGS          |             | 5            |         |
| ORIFICE (HORIZ) FLOW FOR RCP INLETS            |             | 8            |         |
| CONDUIT FLOW THRU INLETS TO OUTLET STRUCTURE   |             | 6            |         |
| TOP OF DAM (EARTH EMBANKMENT)                  |             |              |         |
| $Q = C L H^{3/2}$                              |             | $L = 380'$   |         |
|                                                |             | $C = 2.63$   |         |
| (BROAD-CRESTED WEIR)                           |             |              |         |

PROJECT GRID

|                                              |  |  |  |                    |  |                 |  |      |  |
|----------------------------------------------|--|--|--|--------------------|--|-----------------|--|------|--|
| JOB<br>MECHANICVILLE RESV.                   |  |  |  | SHEET NO.<br>5/    |  | CHECKED BY      |  | DATE |  |
| SUBJECT<br>SPILLWAY DISCHARGES - NO STOPLOGS |  |  |  | COMPUTED BY<br>WCL |  | DATE<br>4/23/81 |  |      |  |

WEIR FLOW OVER SPILLWAY:  $Q = C L H^{3/2}$

$L = 49'$

$C = \text{VARIES W/ } H$

(VERTICAL)  $C = 3.2$

REF: DESIGN OF SMALL DAMS  
BUREC - 1977  
pg. 379

ELEV. C = CREST

$P = 1' +$

(FIG. 25.1)

| USGS        | (RELATIVE)<br>ELEV. | H    | P/H   | $\frac{C_{HCL}}{C_{VERT}}$ | C     | Q    |
|-------------|---------------------|------|-------|----------------------------|-------|------|
| 263         | -0-                 | -0-  | —     | —                          | 3.2   | —    |
|             |                     | 0.1  | 10    | 0.994                      | 3.18  | 4.9  |
|             |                     | 0.2  | 5     | 0.994                      | 3.18  | 13.9 |
|             |                     | 0.5  | 2     | 0.994                      | 3.18  | 55   |
|             |                     | 0.75 | 1.33  | 0.995                      | 3.18  | 101  |
|             |                     | 1    | 1     | 0.998                      | 3.19  | 156  |
|             |                     | 1.5  | 0.666 | 1.005                      | 3.21  | 289  |
|             |                     | 1.59 | —     | —                          | 3.215 | 316  |
|             |                     | 1.74 | —     | —                          | 3.224 | 363  |
|             |                     | 2    | 0.5   | 1.012                      | 3.24  | 449  |
|             |                     | 2.5  | 0.4   | 1.017                      | 3.25  | 629  |
|             |                     | 3    | 0.33  | 1.022                      | 3.27  | 832  |
|             |                     | 3.5  | 0.29  | 1.025                      | 3.28  | 1052 |
| TOP<br>POST | 3.85                | 3.85 | 0.26  | 1.027                      | 3.28  | 1214 |
|             |                     | 4    | 0.25  | 1.029                      | 3.29  |      |
|             |                     | 5    | 0.20  | 1.034                      | 3.30  |      |
| TOP<br>DAM  | 5.5                 | 5.5  | 0.18  | 1.036                      | 3.31  |      |

ORIFICE CONTROL

CONDUIT CONTROL

PROJECT GRID

|                                                                        |  |                    |  |                 |      |
|------------------------------------------------------------------------|--|--------------------|--|-----------------|------|
| JOB<br>MECHANICVILLE RESV.                                             |  | SHEET NO.<br>6/    |  | CHECKED BY      | DATE |
| SUBJECT<br>SPILLWAY DISCHARGES - CONDUIT FLOW TO OUTLET<br>NO STOPLOGS |  | COMPUTED BY<br>WCL |  | DATE<br>4/24/81 |      |

$$Q = A \sqrt{\frac{2gH}{1 + K_b + K_p + K_f L}}$$

FOR ONE PIPE:

$$Q = 21.604 \sqrt{H_f}$$

WHERE  $H_f = (H + 21.5)$

CONC. FLOOR @ +12" BELOW SPILLWAY CREST  
(RELATIVE)

CONDUIT = STEEL

$n = 0.015$

$K_p = 0.0123$

$K_f L = 1.60$

$K_b = \frac{n B}{3}$

$K = 0.225$

$A = 4.909 \text{ SQ FT}$

$L \approx 130'$   
(SHT 7/)

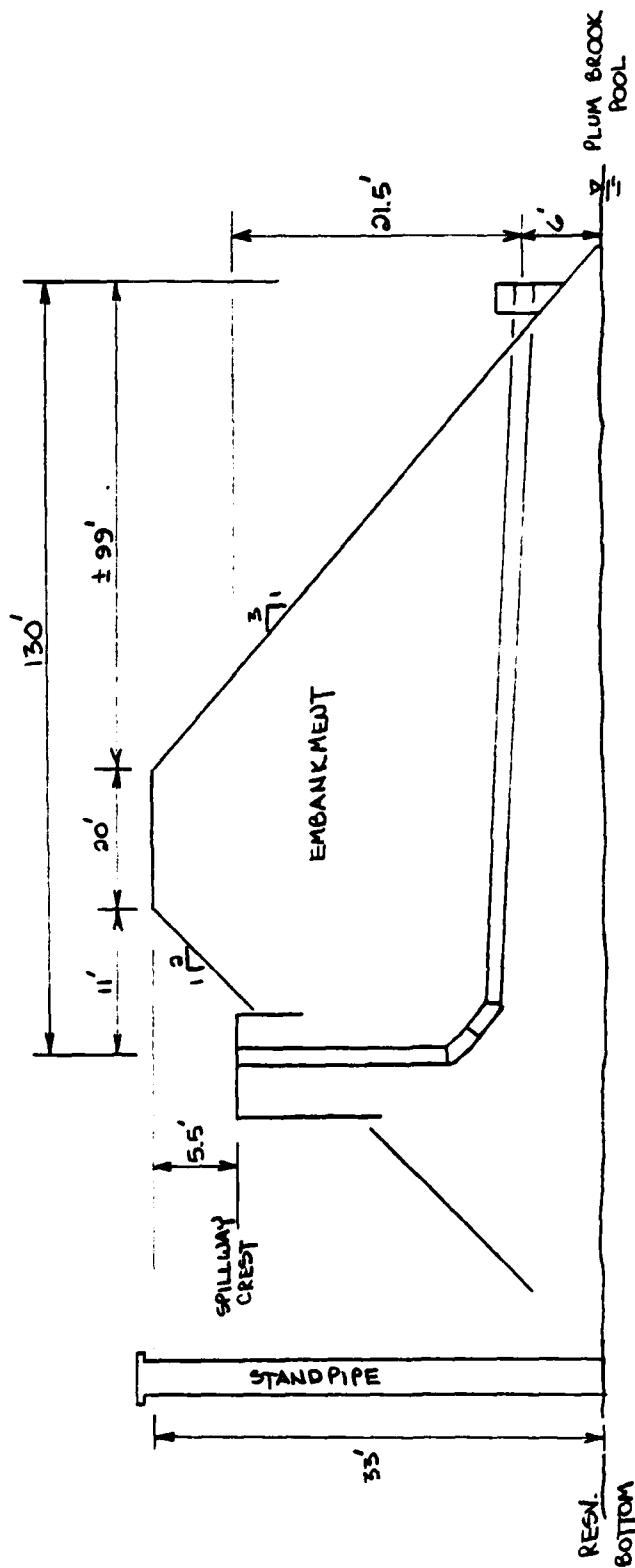
$B = 45^\circ$

$K_b = 0.5$

| USGS<br>ELEV. | H    | H <sub>f</sub> | Q     | 3 PIPES<br>Q |
|---------------|------|----------------|-------|--------------|
| 263           | -0-  | 1              | 22.5  | 102          |
|               | 1.5  | 23             | 103.6 | 310.8        |
|               | 1.75 | 23.25          | 104.2 | 312.6        |
|               | 2    | 23.5           | 104.7 | 314.1        |
|               | 2.5  | 24             | 105.8 | 317.4        |
|               | 2.59 | 24.09          | 106.0 | 318.0        |
|               | 3    | 24.5           | 106.9 | 320.7        |
|               | 3.5  | 25             | 108   | 324          |
|               | 4    | 25.5           | 109.1 | 327.3        |
|               | 4.5  | 26             | 110.1 | 330.3        |
| TOP<br>POST   | 3.85 | 26.35          | 110.9 | 332.7        |
|               | 4    | 26.5           | 111.2 | 333.6        |
|               | 5    | 27.5           | 113.3 | 339.9        |
| TOP<br>DAM    | 5.5  | 28             | 114.3 | 342.9        |

SPILLWAY  
CREST  
CONTROLS



EMBANKMENT CROSS-SECTION  
(ESTIMATED - NTS)

MECHANICVILLE RESERVOIR DAM  
NY - 1061

PROJECT GRID

|                                                                      |  |       |  |                                               |  |                 |  |                       |  |
|----------------------------------------------------------------------|--|-------|--|-----------------------------------------------|--|-----------------|--|-----------------------|--|
| JOB<br>MECHANICVILLE RESN.                                           |  |       |  | SHEET NO.<br>8/                               |  | CHECKED BY      |  | DATE                  |  |
| SUBJECT<br>SPILLWAY DISCHARGES - FLOW INTO RCP INLETS<br>NO STOPLOGS |  |       |  | COMPUTED BY<br>WCL                            |  | DATE<br>4/24/81 |  |                       |  |
| ORIFICE FLOW INTO 30" DIAM. DROP INLETS<br>(HORIZ)                   |  |       |  |                                               |  |                 |  |                       |  |
| PIPE SOCKET BELOW CONC. FLOOR = 0.33'                                |  |       |  | C = 0.62                                      |  |                 |  |                       |  |
| $Q = CA\sqrt{2gH}$                                                   |  |       |  | $A = \frac{\pi D^2}{4} = 4.909 \text{ SQ FT}$ |  |                 |  |                       |  |
|                                                                      |  |       |  | FOR 3 PIPES: $A = 14.727 \text{ SQ FT}$       |  |                 |  |                       |  |
| $Q = 73.274 \sqrt{H}$                                                |  |       |  |                                               |  |                 |  |                       |  |
| CONC. FLOOR @ $\pm 10"$ BELOW SPILLWAY CREST<br>(RELATIVE)           |  |       |  |                                               |  |                 |  |                       |  |
| VESS                                                                 |  | ELEV. |  | H                                             |  | Q               |  | 3 PIPES<br>Q          |  |
| 263                                                                  |  | -0-   |  | 1                                             |  | 73              |  |                       |  |
|                                                                      |  |       |  | 1.1                                           |  | 76              |  |                       |  |
|                                                                      |  |       |  | 1.2                                           |  | 80              |  | SPILLWAY<br>CREST 240 |  |
|                                                                      |  |       |  | 1.5                                           |  | 89              |  | CONTROLS 267          |  |
|                                                                      |  |       |  | 1.75                                          |  | 97              |  | 291                   |  |
|                                                                      |  | 1     |  | 2                                             |  | 103             |  | 309                   |  |
|                                                                      |  | 1.5   |  | 2.5                                           |  | 115             |  | 345                   |  |
|                                                                      |  | 1.74  |  | 2.74                                          |  | 121.3           |  | 363.9                 |  |
|                                                                      |  | 2     |  | 3                                             |  | 127             |  | 381                   |  |
|                                                                      |  |       |  | 3.5                                           |  | 137             |  | 411                   |  |
|                                                                      |  | 3     |  | 4                                             |  | 146             |  | 438                   |  |
|                                                                      |  |       |  | 4.5                                           |  | 155             |  | 465                   |  |
| TOP<br>POST                                                          |  | 3.85  |  | 4.85                                          |  | 161             |  | 483                   |  |
|                                                                      |  | 4     |  | 5                                             |  | 163             |  | 489                   |  |
|                                                                      |  | 5     |  | 6                                             |  | 179             |  | 537                   |  |
| TOP<br>DAM                                                           |  | 5.5   |  | 6.5                                           |  | 186             |  | 558                   |  |

PROJECT GRID

|                                                |                 |                    |                 |
|------------------------------------------------|-----------------|--------------------|-----------------|
| JOB<br>MECHANICVILLE RESV.                     | SHEET NO.<br>9/ | CHECKED BY         | DATE            |
| SUBJECT<br>SPILLWAY DISCHARGES - WITH STOPLOGS |                 | COMPUTED BY<br>WCL | DATE<br>4/24/81 |

SHARP-CRESTED WEIR FLOW OVER STOPLOGS

$Q = C L H^{3/2}$        $C \propto L$  VARY  $w/H$

(NET) STOPLOGS     $L' = 47.6'$        $H = 2.0'$   
ELEV. 0 = CREST

WEIR  $L = L' - 2(NK_p + K_p)H$        $K_p = 0$

(CORNER POSTS)     $N = 4$        $K_p = 0.02$

$\therefore L = 47.6 - 0.16H$

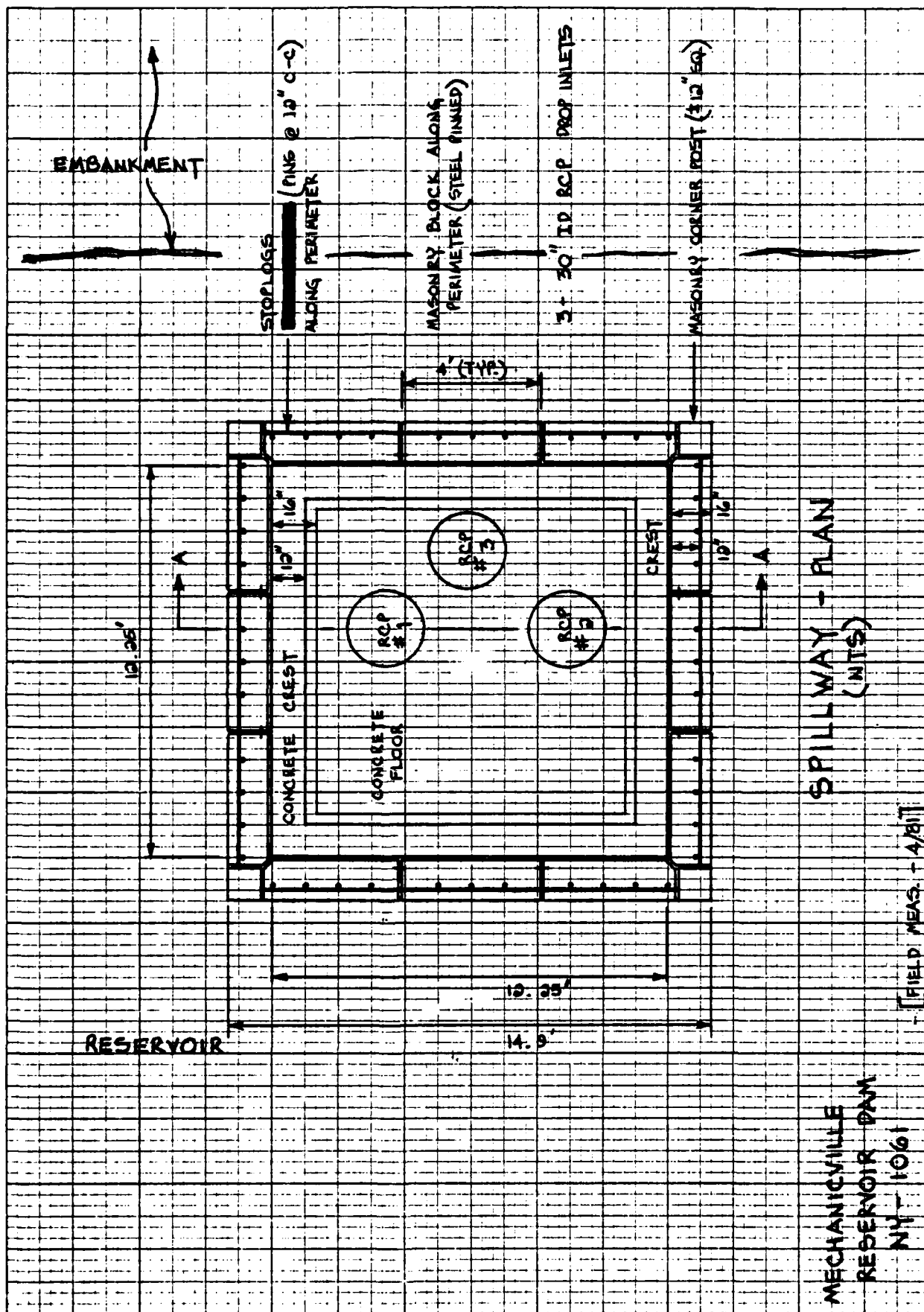
  

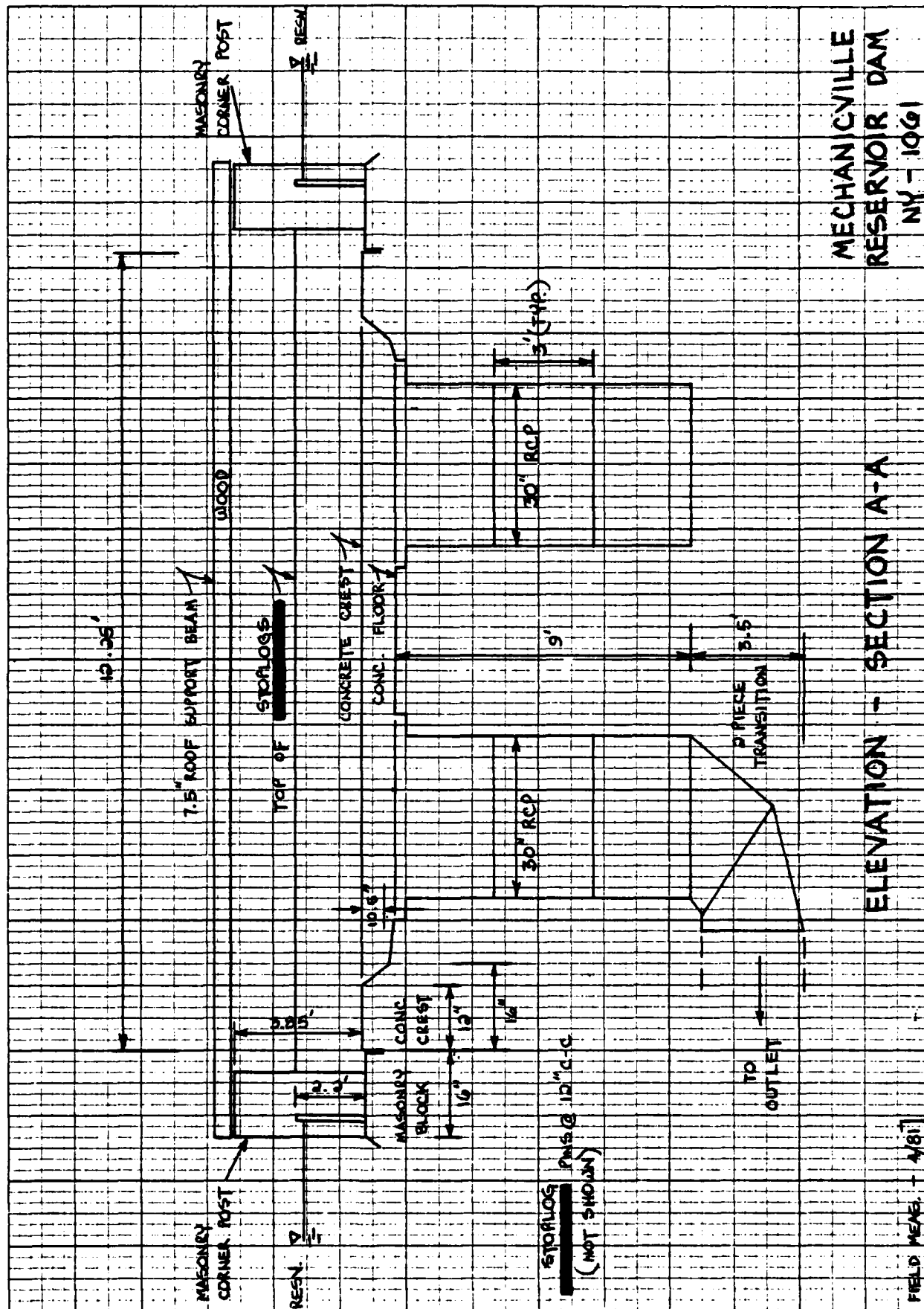
SHARP-CRESTED WEIR w/o END CONTRACTIONS:  
C VARIES w/  $H/P$  RATIO

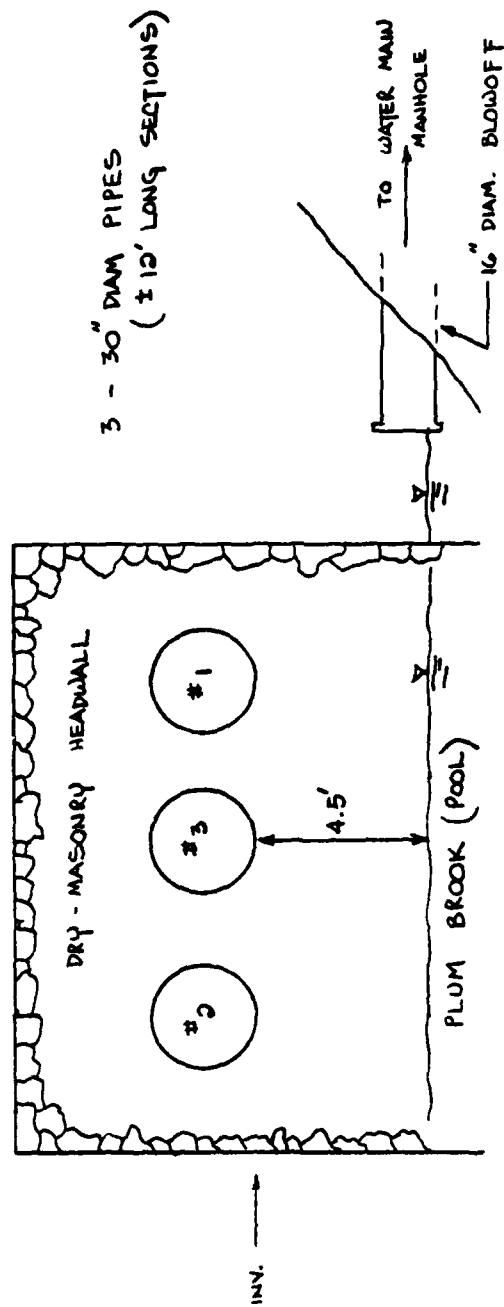
REF: HANDBOOK OF HYDRAULICS 5TH ED.  
KINZ & PRATER  
FIG. 5-2 (b)

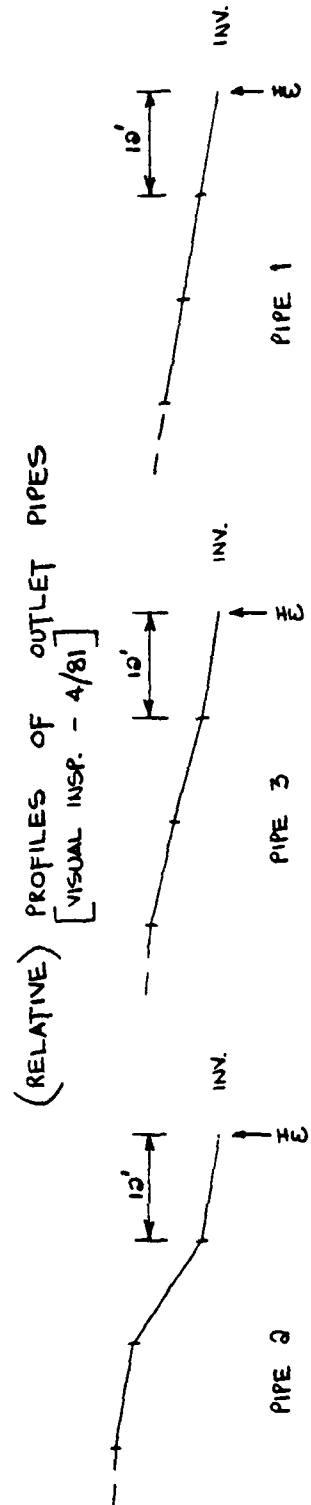
| USGS     | (RELATIVE) | H    | (STOPLOGS) |         | C    | L     | Q   |
|----------|------------|------|------------|---------|------|-------|-----|
|          | ELEV.      |      | $H_B$      | $H_B/P$ |      |       |     |
| 263      | -0-        | -0-  | -2.2       | —       | 3.2  | 47.6  | —   |
|          |            | 2.2  | -0-        | —       | 3.2  | 47.6  | -0- |
|          |            | 2.7  | 0.5        | 0.23    | 3.3  | 47.52 | 55  |
|          |            | 3    | 0.8        | 0.36    | 3.35 | 47.47 | 113 |
|          |            | 3.5  | 1.3        | 0.59    | 3.5  | 47.39 | 245 |
| TOP POST | 3.85       | 3.85 | 1.65       | 0.75    | 3.55 | 47.33 | 356 |







# SPILLWAY OUTLET STRUCTURE

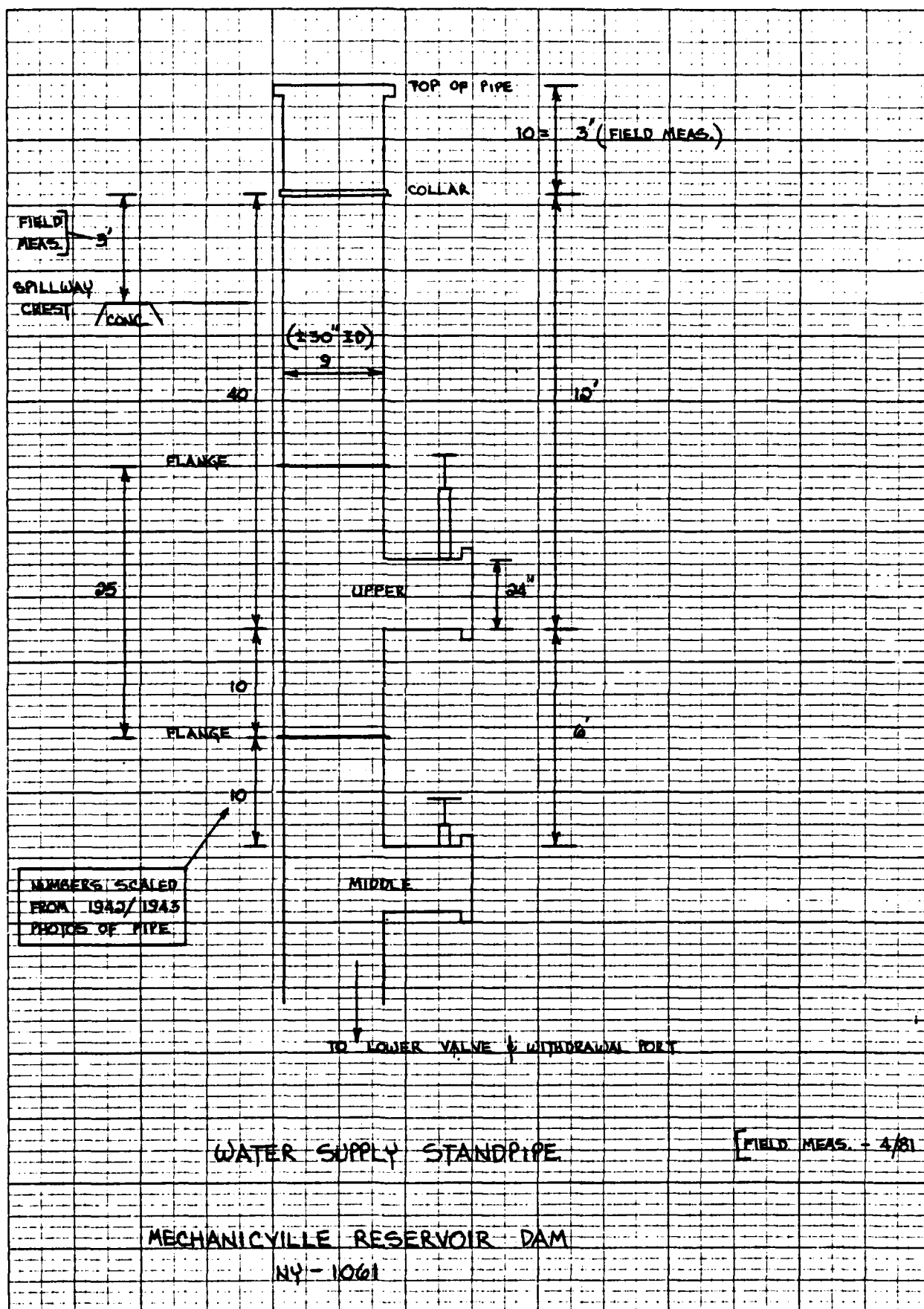


MECHANICVILLE  
RESERVOIR DAM

NY-1061

46 0940

12 X 12 TO THE INCH • 7 X 10 IN. H. S.  
KLEINFELDER & LINSER CO. MADE IN U.S.A.



DOWNSTREAM CHANNEL :

DAM NAME: MECHANICVILLE RESV.

#: NY-1061

FLOW TIME ■■■■■

SHEET # 10 /     

COMPUTED:  $T_c =$           (HRS)

BY: WCL DATE:         

MAP: USGS QUAD SHEET - MECHANICVILLE

CHKD:          DATE:         

[SCS FIG. 15.2]

| BLUE LINE)<br>LENGTH | BASE<br>ELEVATION | Δ ELEV.                     | SLOPE (%) | VELOCITY (fps) | TIME (sec) |
|----------------------|-------------------|-----------------------------|-----------|----------------|------------|
| (■■■)                |                   |                             |           |                |            |
| DAM                  | 263               | RESV. POOL @ SPILLWAY CREST |           |                |            |
| —                    | 235.5             | OUTLET POOL                 |           |                |            |
| —                    | ↓                 |                             |           |                |            |
| —                    | 236               | PLUM BROOK                  |           |                |            |
| 500                  |                   | 6                           | 1.20      | 1.65           | 303        |
| —                    | 230               |                             |           |                |            |
| 800                  |                   | 10                          | 1.25      | 1.69           | 473        |
| —                    | 220               |                             |           |                |            |
| 1900                 |                   |                             | 0.53      | 1.1            | 1727       |
| —                    | 210               |                             |           |                |            |
| 1700                 |                   |                             | 0.59      | 1.16           | 1465       |
| —                    | 200               |                             |           |                |            |
| 500                  |                   | 10                          | 2         | 2.13           | 235        |
| —                    | 190               |                             |           |                |            |
| 900                  |                   | 30                          | 3.33      | 2.75           | 327        |
| —                    | 160               |                             |           |                |            |
| 400                  |                   | 10                          | 2.5       | 2.4            | 166        |
| —                    | 150               |                             |           |                |            |
| 500                  |                   | 10                          | 2         | 2.13           | 235        |
| —                    | 140               |                             |           |                |            |
| 500 — TO             | 140               |                             |           |                |            |
| 800                  |                   | 10                          | 1.25      | 1.69           | 473        |
| —                    | 130               |                             |           |                |            |
|                      | 130               | LOCAL ROAD                  |           |                |            |

1" = 8000'

VELOCITY  $\approx$  1.5 fps (1.48)

SUBTOTAL: 5404

(1.50 HRS)

PROJECT GRID

|                                            |  |                    |            |      |
|--------------------------------------------|--|--------------------|------------|------|
| JOB<br>MECHANICVILLE RESV.                 |  | SHEET NO.<br>11/   | CHECKED BY | DATE |
| SUBJECT<br>DOWNSTREAM CHANNEL = PLUM BROOK |  | COMPUTED BY<br>WCL |            | DATE |

|                                           |              |          |
|-------------------------------------------|--------------|----------|
| REACH # 1 = DAM TO 3200' DNSTRM (EL. 210) |              |          |
| L = 3200'                                 |              |          |
| (WTD AVE) SLOPE @ 0.81%                   |              |          |
| STREAM:                                   | MAIN CHANNEL | OVERBANK |
| DEPTH                                     | USE 2'       | —        |
| WIDTH                                     | USE 15'      | 200'     |
| "n" VALUE                                 | USE 0.04     | 0.04     |

|                                                                   |              |          |
|-------------------------------------------------------------------|--------------|----------|
| REACH # 2 = CONTOUR 210 DNSTRM TO LOCAL ROAD (GEORGE THOMPSON RD) |              |          |
| L = 4800'                                                         |              |          |
| (WTD AVE) SLOPE @ 1.67%                                           |              |          |
| STREAM:                                                           | MAIN CHANNEL | OVERBANK |
| DEPTH                                                             | USE 3'       | —        |
| WIDTH                                                             | USE 15'      | 100'     |
| "n" VALUE                                                         | USE 0.04     | 0.04     |

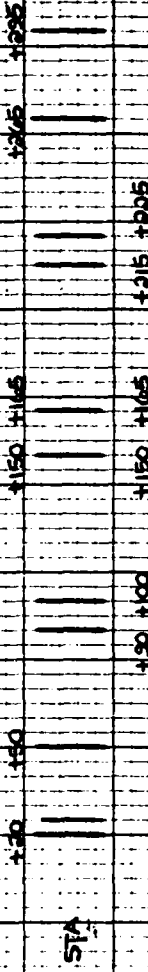
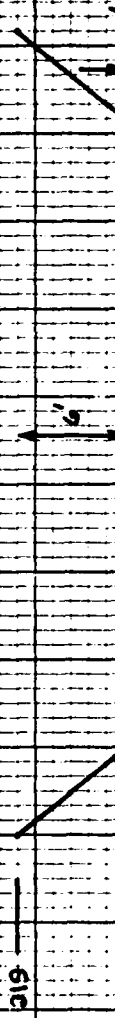
|                                                   |  |
|---------------------------------------------------|--|
| TOTAL REACH = 8000'                               |  |
| (AVE) SLOPE = $\frac{(23\% - 13\%)}{80}$ = 1.325% |  |

MECHANICVILLE RESERVOIR

NY - 1061

PLUM BROOK - DOWNSTREAM CHANNEL

REACH # 1 @ 3200'



REACH # 2 @ 8000'

NY - 1061

DAM: MECHANICVILLE RESERVOIR

## SUMMARY OF FLOOD ANALYSIS

By: WCL

Date:

Sht: 13

| # | STOPLOGS<br>[REDACTED] OUT | ANALYSIS CONDITIONS: | RATIO | PEAK   |                | Overtopping<br>Depth @ Dam | STA: 32K<br>W.S.Elev. | DOWNSTREAM LOCATION       |           | Inv = 130.0<br>Flow Depth |
|---|----------------------------|----------------------|-------|--------|----------------|----------------------------|-----------------------|---------------------------|-----------|---------------------------|
|   |                            |                      |       | INFLOW | OUTFLOW        |                            |                       | Inv = 210.0<br>Flow Depth | W.S.Elev. |                           |
| 1 | NO BREACH                  |                      | 0.20  | 634    | 342            | -0-                        | 212.7                 | 2.7                       | 132.9     | 2.9                       |
|   |                            |                      | 0.21  | 665    | 406            | 0.16                       | 212.8                 | 2.8                       | 133.2     | 3.2                       |
|   |                            |                      | 0.5   | 1584   | 1587           | 1.15                       | 213.9                 | 3.9                       | 134.8     | 4.8                       |
|   |                            |                      | 1.0   | 3168   | 3171           | 1.99                       | 214.8                 | 4.8                       | 135.9     | 5.9                       |
|   |                            |                      | 0.20  | 634    | 342            | -0-                        | 212.7                 | 2.7                       | 132.9     | 2.9                       |
| 2 | BREACH: BOT. EL. 252       |                      | 0.20  | 634    | 342            | -0-                        | 212.7                 | 2.7                       | 132.9     | 2.9                       |
|   | TFAIL = 0.5 MRS            |                      |       |        |                |                            |                       |                           |           |                           |
|   | BREACH DEPTH = 16.5'       |                      | 0.21  | 665    | 406            | 0.16                       | 212.8                 | 2.8                       | 133.2     | 3.2                       |
|   | FAILEL = 269.5             |                      | 0.5   | 1584   | 6077           | 1.11                       | 215.4                 | 5.4                       | 136.5     | 6.5                       |
|   |                            |                      | 1.0   | 3168   | 6534           | 1.36                       | 215.7                 | 5.7                       | 137.0     | 7.0                       |
| 3 | BREACH: BOT. EL. 236       |                      | 0.20  | 634    | 342            | -0-                        | 212.7                 | 2.7                       | 132.9     | 2.9                       |
|   | TFAIL = 2 MRS              |                      |       |        |                |                            |                       |                           |           |                           |
|   | BREACH DEPTH = 32.5'       |                      | 0.21  | 665    | 406            | 0.16                       | 212.8                 | 2.8                       | 133.2     | 3.2                       |
|   | FAILEL = 269.5             |                      | 0.5   | 1584   | 4663<br>(4694) | 1.11                       | 215.2                 | 5.2                       | 136.4     | 6.4                       |
|   |                            |                      | 1.0   | 3168   | 5575<br>(5930) | 1.36                       | 215.6                 | 5.6                       | 137.0     | 7.0                       |

By: WCL Date:           

## SUMMARY OF FLOOD ANALYSIS

DOWNSTREAM LOCATION

**ANALYSIS CONDITIONS:**

[illegible]

.....  
 FLOOD HYDROGRAPH PACKAGE (MC-1)  
 DAM SAFETY VERSION JULY 1978  
 LAST MODIFICATION 26 FEB 79  
 NOCIFLD FOR HONEYWELL APR 79  
 .....

.....  
 NEW YORK STATE  
 DEPT OF ENVIRONMENTAL CONSERVATION  
 FLOOD PROTECTION BUREAU  
 .....

1 A1 NY-1061  
 2 A2  
 3 A3  
 4 B 200  
 5 B1 5

MECHANICVILLE RESERVOIR DAM  
 DEC 22EA-142 UH -- PLUM BROOK  
 CITY WATER SUPPLY

UPPER HUDSON RIVER BASIN  
 SARATOGA COUNTY  
 SNYDER UH

6 J 1 8 1

7 J1 0.20 0.21 0.22 0.23 0.24 0.25 0.50 1

8 K 0 BASIN

9 K1 INFLOW HYDROGRAPH -- DAM

10 M 1 1 2.19 2.19 1

11 P 19 111 123 132 142

12 I 1.0 0.2

13 W 3.61 0.625

14 X -6 -0.1 1.5

15 K 1 DAM

16 K1 ROUTEE OUTFLOW - DAM - SPILLWAY ELEV 263-USGS FLASHBOARDS OUT  
 17 Y 1 NO BREACH

18 Y1 1 -263 -1

19 Y4 263 263.1 263.2 263.5 264.0 264.5 264.59 265.0 265.5 266.0

20 Y4 266.5 266.85 267.0 268.0 268.5

21 Y5 0 4.9 13.9 55 156 285 316 320 324 327

22 Y5 330 332 333 340 343

23 \$S 201 322

24 \$E 263 268.5

25 \$S 263

26 \$D 268.5 2.63 1.5 380

27 K 1 32K

28 K1 REACH 1 DAM TO 210

29 Y 1 1

30 Y1 1

31 Y6 0.04 0.04 0.04 210 220 3200 0.0081  
32 Y7 20 219 50 213 150 212 150 210 165 210

33 Y7 165 212 265 213 295 219

34 K 1 80K 1

35 K1 REACH 2 210 TO 130 LOCAL ROAD

36 Y 1 1

37 Y1 1

38 Y6 0.04 0.04 0.04 130 145 4800 0.0167

39 Y7 90 144 200 134 150 133 150 130 165 130

40 Y7 165 133 215 134 225 144

41 K 99

42 A

43 A

44 A

45 A

46 A

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT BASIN  
ROUTE HYDROGRAPH TO DAM  
ROUTE HYDROGRAPH TO 32K  
ROUTE HYDROGRAPH TO 80K  
END OF NETWORK

\*\*\*\*\*  
NEW YORK STATE  
DEPT OF ENVIRONMENTAL CONSERVATION  
FLOOD PROTECTION BUREAU

|              |                             |                          |
|--------------|-----------------------------|--------------------------|
| NY-1061      | MECHANICVILLE RESERVOIR DAM | UPPER HUDSON RIVER BASIN |
| DEC 22-A-142 | UH -- PLUM BROOK            | SARATOGA COUNTY          |
| CITY         | WATER SUPPLY                | SNYDER UH                |

| NO  | NHR | NPJA | IDAY | IHR | IMIN  | METRC | IPLT | IPRT | INSTAN |
|-----|-----|------|------|-----|-------|-------|------|------|--------|
| 200 | 0   | 3C   | 0    | 0   | 0     | 0     | 0    | 0    | 0      |
|     |     | JOPR | 5    | NUT | LROPT | TRACE |      |      |        |

```

NPLAN= 1 NRTIO= 8 LRTIO= 1
RTIOS= 0.20 0.21 0.22 0.23 0.24 0.25 0.50 1.00

```

| INFLOW HYDROGRAPH -- DAM |       |      |       |      |      |       |        |       |  |
|--------------------------|-------|------|-------|------|------|-------|--------|-------|--|
| ISTAQ                    | ICOMP | ICON | ITAPE | JPLT | JPRT | INAME | ISTAGE | IAUIC |  |
| BASIN                    | 0     | 0    | 0     | 0    | 0    | 1     | 0      | 0     |  |

| INHDG | IUNH | TAKEA | SNAP | TRSDA | TR:PC | RATIO | ISNOW | ISAME | LOCAL |
|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| 1     | 1    | 2.19  | 0.   | 2.19  | 0.    | 0.    | 0     | 1     | 0     |

| SPFE | PFS   | R6     | R12    | R48    | R72 | R96 |
|------|-------|--------|--------|--------|-----|-----|
| 0.   | 19.00 | 111.00 | 123.00 | 142.00 | 0.  | 0.  |

| LOSS DATA |       |       |       |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| LROPT     | STPKR | DLTKR | RYLOL | ERAIN | STPKS | RTICK | STRTL | CNSTL | ALSHX | RTIMP |
| 0         | 0     | 0     | 1.00  | 0     | 0     | 1.00  | 1.00  | 0.20  | 0     | 0     |

$\tau_F = 3.61$      $\tau_{CF} = 0.97$      $NIA = 0$

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE  $IC = 8.20$  AND  $RE = 6.53$  INTERVALS

| UNIT HYDROGRAPH 39 END-OF-PERIOD ORDINATES, IAG= 3.58 HOURS, CP= 0.63 VOL= 1.00 |      |      |      |      |      |      |      |      |      |
|---------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|
| 12.                                                                             | 45.  | 85.  | 139. | 188. | 226. | 247. | 250. | 231. | 199. |
| 171.                                                                            | 146. | 126. | 108. | 92.  | 79.  | 68.  | 58.  | 50.  | 43.  |
| 37.                                                                             | 32.  | 27.  | 23.  | 20.  | 17.  | 15.  | 13.  | 11.  | 9.   |
| 8.                                                                              | 7.   | 6.   | 5.   | 4.   | 4.   | 3.   | 3.   | 2.   | 2.   |

| END-OF-PERIOD FLOW |       |       |        |      |      |      |        |       |        |      |      |      |        |
|--------------------|-------|-------|--------|------|------|------|--------|-------|--------|------|------|------|--------|
| 0                  | HJ.DA | HR.MN | PERIOD | RAIN | EXCS | LGSS | COMP Q | HR.MN | PERIOD | RAIN | EXCS | LOSS | COMP Q |

| NO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP 0 | 0. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP 0 |
|--------|--------|--------|------|------|------|--------|-------|--------|--------|------|------|------|--------|
| 1.01   | 0.30   | 1      | 0.00 | C.   | 0.00 | 13.    | 1.03  | 2.30   | 101    | 0.   | 0.   | 0.   | 465.   |
| 1.01   | 1.00   | 2      | 0.00 | C.   | 0.00 | 12.    | 1.03  | 3.00   | 102    | 0.   | 0.   | 0.   | 399.   |
| 1.01   | 1.30   | 3      | 0.00 | C.   | 0.00 | 12.    | 1.03  | 3.30   | 103    | 0.   | 0.   | 0.   | 342.   |
| 1.01   | 2.00   | 4      | 0.00 | C.   | 0.00 | 11.    | 1.03  | 4.00   | 104    | 0.   | 0.   | 0.   | 311.   |
| 1.01   | 2.30   | 5      | 0.00 | C.   | 0.00 | 11.    | 1.03  | 4.30   | 105    | 0.   | 0.   | 0.   | 298.   |
| 1.01   | 3.00   | 6      | 0.00 | C.   | 0.00 | 10.    | 1.03  | 5.00   | 106    | 0.   | 0.   | 0.   | 286.   |
| 1.01   | 3.30   | 7      | 0.00 | C.   | 0.00 | 10.    | 1.03  | 5.30   | 107    | 0.   | 0.   | 0.   | 275.   |
| 1.01   | 4.00   | 8      | 0.00 | C.   | 0.00 | 9.     | 1.03  | 6.00   | 108    | 0.   | 0.   | 0.   | 264.   |
| 1.01   | 4.30   | 9      | 0.00 | C.   | 0.00 | 9.     | 1.03  | 6.30   | 109    | 0.   | 0.   | 0.   | 254.   |
| 1.01   | 5.00   | 10     | 0.00 | C.   | 0.00 | 9.     | 1.03  | 7.00   | 110    | 0.   | 0.   | 0.   | 244.   |
| 1.01   | 5.30   | 11     | 0.00 | C.   | 0.00 | 8.     | 1.03  | 7.30   | 111    | 0.   | 0.   | 0.   | 234.   |
| 1.01   | 6.00   | 12     | 0.00 | C.   | 0.00 | 8.     | 1.03  | 8.00   | 112    | 0.   | 0.   | 0.   | 225.   |
| 1.01   | 6.30   | 13     | 0.01 | C.   | 0.01 | 8.     | 1.03  | 8.30   | 113    | 0.   | 0.   | 0.   | 216.   |
| 1.01   | 7.00   | 14     | 0.01 | C.   | 0.01 | 7.     | 1.03  | 9.00   | 114    | 0.   | 0.   | 0.   | 207.   |
| 1.01   | 7.30   | 15     | 0.01 | C.   | 0.01 | 7.     | 1.03  | 9.30   | 115    | 0.   | 0.   | 0.   | 199.   |
| 1.01   | 8.00   | 16     | 0.01 | C.   | 0.01 | 7.     | 1.03  | 10.00  | 116    | 0.   | 0.   | 0.   | 191.   |
| 1.01   | 8.30   | 17     | 0.01 | C.   | 0.01 | 7.     | 1.03  | 10.30  | 117    | 0.   | 0.   | 0.   | 183.   |
| 1.01   | 9.00   | 18     | 0.01 | C.   | 0.01 | 6.     | 1.03  | 11.00  | 118    | 0.   | 0.   | 0.   | 176.   |
| 1.01   | 9.30   | 19     | 0.01 | C.   | 0.01 | 6.     | 1.03  | 11.30  | 119    | 0.   | 0.   | 0.   | 169.   |
| 1.01   | 10.00  | 20     | 0.01 | C.   | 0.01 | 6.     | 1.03  | 12.00  | 120    | 0.   | 0.   | 0.   | 162.   |
| 1.01   | 10.30  | 21     | 0.01 | C.   | 0.01 | 6.     | 1.03  | 12.30  | 121    | 0.   | 0.   | 0.   | 156.   |
| 1.01   | 11.00  | 22     | 0.01 | C.   | 0.01 | 5.     | 1.03  | 13.00  | 122    | 0.   | 0.   | 0.   | 150.   |
| 1.01   | 11.30  | 23     | 0.01 | C.   | 0.01 | 5.     | 1.03  | 13.30  | 123    | 0.   | 0.   | 0.   | 144.   |
| 1.01   | 12.00  | 24     | 0.01 | C.   | 0.01 | 5.     | 1.03  | 14.00  | 124    | 0.   | 0.   | 0.   | 138.   |
| 1.01   | 12.30  | 25     | 0.06 | C.   | 0.06 | 5.     | 1.03  | 14.30  | 125    | 0.   | 0.   | 0.   | 133.   |
| 1.01   | 13.00  | 26     | 0.06 | C.   | 0.06 | 5.     | 1.03  | 15.00  | 126    | 0.   | 0.   | 0.   | 127.   |
| 1.01   | 13.30  | 27     | 0.08 | C.   | 0.08 | 4.     | 1.03  | 15.30  | 127    | 0.   | 0.   | 0.   | 122.   |
| 1.01   | 14.00  | 28     | 0.08 | C.   | 0.08 | 4.     | 1.03  | 16.00  | 128    | 0.   | 0.   | 0.   | 117.   |
| 1.01   | 14.30  | 29     | 0.10 | C.   | 0.10 | 4.     | 1.03  | 16.30  | 129    | 0.   | 0.   | 0.   | 113.   |
| 1.01   | 15.00  | 30     | 0.10 | C.   | 0.10 | 4.     | 1.03  | 17.00  | 130    | 0.   | 0.   | 0.   | 108.   |
| 1.01   | 15.30  | 31     | 0.12 | C.   | 0.12 | 4.     | 1.03  | 17.30  | 131    | 0.   | 0.   | 0.   | 104.   |
| 1.01   | 16.00  | 32     | 0.37 | C.10 | 0.27 | 5.     | 1.03  | 18.00  | 132    | 0.   | 0.   | 0.   | 100.   |
| 1.01   | 16.30  | 33     | 0.09 | C.   | 0.09 | 8.     | 1.03  | 18.30  | 133    | 0.   | 0.   | 0.   | 96.    |
| 1.01   | 17.00  | 34     | 0.09 | C.   | 0.09 | 12.    | 1.03  | 19.00  | 134    | 0.   | 0.   | 0.   | 92.    |
| 1.01   | 17.30  | 35     | 0.07 | C.   | 0.07 | 17.    | 1.03  | 19.30  | 135    | 0.   | 0.   | 0.   | 88.    |
| 1.01   | 18.00  | 36     | 0.07 | C.   | 0.07 | 22.    | 1.03  | 20.00  | 136    | 0.   | 0.   | 0.   | 85.    |
| 1.01   | 18.30  | 37     | 0.01 | C.   | 0.01 | 26.    | 1.03  | 20.30  | 137    | 0.   | 0.   | 0.   | 82.    |
| 1.01   | 19.00  | 38     | 0.01 | C.   | 0.01 | 28.    | 1.03  | 21.00  | 138    | 0.   | 0.   | 0.   | 78.    |
| 1.01   | 19.30  | 39     | 0.01 | C.   | 0.01 | 28.    | 1.03  | 21.30  | 139    | 0.   | 0.   | 0.   | 75.    |
| 1.01   | 20.00  | 40     | 0.01 | C.   | 0.01 | 26.    | 1.03  | 22.00  | 140    | 0.   | 0.   | 0.   | 72.    |
| 1.01   | 20.30  | 41     | 0.01 | C.   | 0.01 | 23.    | 1.03  | 22.30  | 141    | 0.   | 0.   | 0.   | 69.    |
| 1.01   | 21.00  | 42     | 0.01 | C.   | 0.01 | 20.    | 1.03  | 23.00  | 142    | 0.   | 0.   | 0.   | 67.    |
| 1.01   | 21.30  | 43     | 0.01 | C.   | 0.01 | 17.    | 1.03  | 23.30  | 143    | 0.   | 0.   | 0.   | 64.    |
| 1.01   | 22.00  | 44     | 0.01 | C.   | 0.01 | 15.    | 1.04  | 0.     | 144    | 0.   | 0.   | 0.   | 61.    |
| 1.01   | 22.30  | 45     | 0.01 | C.   | 0.01 | 15.    | 1.04  | 0.30   | 145    | 0.   | 0.   | 0.   | 59.    |
| 1.01   | 23.00  | 46     | 0.01 | C.   | 0.01 | 11.    | 1.04  | 1.00   | 146    | 0.   | 0.   | 0.   | 57.    |
| 1.01   | 23.30  | 47     | 0.01 | C.   | 0.01 | 10.    | 1.04  | 1.30   | 147    | 0.   | 0.   | 0.   | 54.    |
| 1.02   | 0.     | 48     | 0.01 | C.   | 0.01 | 9.     | 1.04  | 2.00   | 148    | 0.   | 0.   | 0.   | 52.    |
| 1.02   | 0.30   | 49     | 0.05 | C.   | 0.05 | 8.     | 1.04  | 2.30   | 149    | 0.   | 0.   | 0.   | 50.    |
| 1.02   | 1.00   | 50     | 0.05 | C.   | 0.05 | 7.     | 1.04  | 3.00   | 150    | 0.   | 0.   | 0.   | 48.    |
| 1.02   | 1.30   | 51     | 0.05 | C.   | 0.05 | 6.     | 1.04  | 3.30   | 151    | 0.   | 0.   | 0.   | 46.    |
| 1.02   | 2.00   | 52     | 0.05 | C.   | 0.05 | 5.     | 1.04  | 4.00   | 152    | 0.   | 0.   | 0.   | 44.    |
| 1.02   | 2.30   | 53     | 0.05 | C.   | 0.05 | 5.     | 1.04  | 4.30   | 153    | 0.   | 0.   | 0.   | 43.    |
| 1.02   | 3.00   | 54     | 0.05 | C.   | 0.05 | 4.     | 1.04  | 5.00   | 154    | 0.   | 0.   | 0.   | 41.    |
| 1.02   | 3.30   | 55     | 0.05 | C.   | 0.05 | 4.     | 1.04  | 5.30   | 155    | 0.   | 0.   | 0.   | 39.    |
| 1.02   | 4.00   | 56     | 0.05 | C.   | 0.05 | 3.     | 1.04  | 6.00   | 156    | 0.   | 0.   | 0.   | 38.    |
| 1.02   | 4.30   | 57     | 0.05 | C.   | 0.05 | 3.     | 1.04  | 6.30   | 157    | 0.   | 0.   | 0.   | 36.    |
| 1.02   | 5.00   | 58     | 0.05 | C.   | 0.05 | 3.     | 1.04  | 7.00   | 158    | 0.   | 0.   | 0.   | 34.    |

|      |       |     |      |      |      |       |      |       |     |    |    |     |
|------|-------|-----|------|------|------|-------|------|-------|-----|----|----|-----|
| 1.02 | 6.30  | 61  | 0.15 | 0.05 | 0.10 | 5.    | 1.04 | 8.30  | 161 | 0. | 0. | 31. |
| 1.02 | 7.00  | 62  | 0.15 | 0.05 | 0.10 | 5.    | 1.04 | 9.00  | 162 | 0. | 0. | 30. |
| 1.02 | 7.30  | 63  | 0.15 | 0.05 | 0.10 | 9.    | 1.04 | 9.30  | 163 | 0. | 0. | 28. |
| 1.02 | 8.00  | 64  | 0.15 | 0.05 | 0.10 | 16.   | 1.04 | 10.00 | 164 | 0. | 0. | 27. |
| 1.02 | 8.30  | 65  | 0.15 | 0.05 | 0.10 | 26.   | 1.04 | 10.30 | 165 | 0. | 0. | 26. |
| 1.02 | 9.00  | 66  | 0.15 | 0.05 | 0.10 | 38.   | 1.04 | 11.00 | 166 | 0. | 0. | 25. |
| 1.02 | 9.30  | 67  | 0.15 | 0.05 | 0.10 | 50.   | 1.04 | 11.30 | 167 | 0. | 0. | 24. |
| 1.02 | 10.00 | 68  | 0.15 | 0.05 | 0.10 | 63.   | 1.04 | 12.00 | 168 | 0. | 0. | 23. |
| 1.02 | 10.30 | 69  | 0.15 | 0.05 | 0.10 | 75.   | 1.04 | 12.30 | 169 | 0. | 0. | 22. |
| 1.02 | 11.00 | 70  | 0.15 | 0.05 | 0.10 | 86.   | 1.04 | 13.00 | 170 | 0. | 0. | 21. |
| 1.02 | 11.30 | 71  | 0.15 | 0.05 | 0.10 | 94.   | 1.04 | 13.30 | 171 | 0. | 0. | 21. |
| 1.02 | 12.00 | 72  | 0.15 | 0.05 | 0.10 | 102.  | 1.04 | 14.00 | 172 | 0. | 0. | 20. |
| 1.02 | 12.30 | 73  | 0.84 | 0.74 | 0.10 | 117.  | 1.04 | 14.30 | 173 | 0. | 0. | 19. |
| 1.02 | 13.00 | 74  | 0.84 | 0.74 | 0.10 | 153.  | 1.04 | 15.00 | 174 | 0. | 0. | 18. |
| 1.02 | 13.30 | 75  | 1.01 | 0.51 | 0.10 | 221.  | 1.04 | 15.30 | 175 | 0. | 0. | 17. |
| 1.02 | 14.00 | 76  | 1.01 | 0.51 | 0.10 | 329.  | 1.04 | 16.00 | 176 | 0. | 0. | 17. |
| 1.02 | 14.30 | 77  | 1.27 | 1.17 | 0.10 | 481.  | 1.04 | 16.30 | 177 | 0. | 0. | 16. |
| 1.02 | 15.00 | 78  | 1.27 | 1.17 | 0.10 | 675.  | 1.04 | 17.00 | 178 | 0. | 0. | 15. |
| 1.02 | 15.30 | 79  | 1.54 | 1.44 | 0.10 | 906.  | 1.04 | 17.30 | 179 | 0. | 0. | 15. |
| 1.02 | 16.00 | 80  | 4.87 | 4.77 | 0.10 | 1207. | 1.04 | 18.00 | 180 | 0. | 0. | 14. |
| 1.02 | 16.30 | 81  | 1.18 | 1.08 | 0.10 | 1586. | 1.04 | 18.30 | 181 | 0. | 0. | 14. |
| 1.02 | 17.00 | 82  | 1.18 | 1.08 | 0.10 | 1995. | 1.04 | 19.00 | 182 | 0. | 0. | 13. |
| 1.02 | 17.30 | 83  | 0.93 | 0.83 | 0.10 | 2399. | 1.04 | 19.30 | 183 | 0. | 0. | 13. |
| 1.02 | 18.00 | 84  | 0.93 | 0.83 | 0.10 | 2762. | 1.04 | 20.00 | 184 | 0. | 0. | 12. |
| 1.02 | 18.30 | 85  | 0.07 | 0.   | 0.07 | 3031. | 1.04 | 20.30 | 185 | 0. | 0. | 12. |
| 1.02 | 19.00 | 86  | 0.07 | 0.   | 0.07 | 3168. | 1.04 | 21.00 | 186 | 0. | 0. | 11. |
| 1.02 | 19.30 | 87  | 0.07 | 0.   | 0.07 | 3161. | 1.04 | 21.30 | 187 | 0. | 0. | 11. |
| 1.02 | 20.00 | 88  | 0.07 | 0.   | 0.07 | 2998. | 1.04 | 22.00 | 188 | 0. | 0. | 10. |
| 1.02 | 20.30 | 89  | 0.07 | 0.   | 0.07 | 2733. | 1.04 | 22.30 | 189 | 0. | 0. | 10. |
| 1.02 | 21.00 | 90  | 0.07 | 0.   | 0.07 | 2439. | 1.04 | 23.00 | 190 | 0. | 0. | 10. |
| 1.02 | 21.30 | 91  | 0.07 | 0.   | 0.07 | 2138. | 1.04 | 23.30 | 191 | 0. | 0. | 9.  |
| 1.02 | 22.00 | 92  | 0.07 | 0.   | 0.07 | 1848. | 1.05 | 0.    | 192 | 0. | 0. | 9.  |
| 1.02 | 22.30 | 93  | 0.07 | 0.   | 0.07 | 1586. | 1.05 | 0.30  | 193 | 0. | 0. | 8.  |
| 1.02 | 23.00 | 94  | 0.07 | 0.   | 0.07 | 1361. | 1.05 | 1.00  | 194 | 0. | 0. | 8.  |
| 1.02 | 23.30 | 95  | 0.07 | 0.   | 0.07 | 1167. | 1.05 | 1.30  | 195 | 0. | 0. | 8.  |
| 1.03 | 0.    | 96  | 0.07 | 0.   | 0.07 | 1001. | 1.05 | 2.00  | 196 | 0. | 0. | 7.  |
| 1.03 | 0.30  | 97  | 0.   | 0.   | 0.   | 859.  | 1.05 | 2.30  | 197 | 0. | 0. | 7.  |
| 1.03 | 1.00  | 98  | 0.   | 0.   | 0.   | 737.  | 1.05 | 3.00  | 198 | 0. | 0. | 7.  |
| 1.03 | 1.30  | 99  | 0.   | 0.   | 0.   | 632.  | 1.05 | 3.30  | 199 | 0. | 0. | 7.  |
| 1.03 | 2.00  | 100 | 0.   | 0.   | 0.   | 542.  | 1.05 | 4.00  | 200 | 0. | 0. | 6.  |

SUM 21.58 16.40 5.19 52239.  
( 548.3) ( 416.3) ( 132.3) ( 1479.24)

|            | PEAK  | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|------------|-------|--------|---------|---------|--------------|
| CFS        | 3168. | 2521.  | 98.     | 359.    | 52236.       |
| CMS        | 90.   | 71.    | 21.     | 10.     | 1479.        |
| INCHES     |       | 10.71  | 16.77   | 18.32   | 18.49        |
| MM         |       | 272.02 | 425.16  | 465.38  | 469.56       |
| AC-FT      |       | 1250.  | 155.    | 2139.   | 2158.        |
| THOUS CU M |       | 1542.  | 241.    | 2638.   | 2662.        |

HYDROGRAPH AT STA BASIN FOR PLAN 1, RATIO 1

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 3. | 2. | 2. | 2. | 2. | 2. |
| 2. | 2. | 1. | 1. | 1. | 1. |
| 1. | 1. | 1. | 1. | 1. | 1. |
| 1. | 1. | 2. | 4. | 5. | 5. |

19. 20. 21. 31. 44. 66. 96. 135. 181. 241.

|      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|
| 317. | 399. | 480. | 552. | 606. | 634. | 632. | 600. | 547. | 488. |
| 428. | 370. | 317. | 272. | 233. | 200. | 172. | 147. | 126. | 108. |
| 93.  | 80.  | 68.  | 62.  | 40.  | 57.  | 55.  | 51.  | 49.  | 49.  |
| 47.  | 45.  | 42.  | 41.  | 40.  | 38.  | 37.  | 35.  | 34.  | 32.  |
| 31.  | 30.  | 29.  | 28.  | 27.  | 25.  | 24.  | 23.  | 22.  | 22.  |
| 21.  | 20.  | 19.  | 18.  | 18.  | 17.  | 16.  | 16.  | 15.  | 14.  |
| 14.  | 13.  | 12.  | 12.  | 12.  | 11.  | 11.  | 10.  | 10.  | 10.  |
| 9.   | 9.   | 8.   | 8.   | 8.   | 8.   | 7.   | 7.   | 7.   | 6.   |
| 6.   | 6.   | 5.   | 5.   | 5.   | 5.   | 5.   | 5.   | 4.   | 4.   |
| 4.   | 4.   | 4.   | 4.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   |
| 3.   | 3.   | 3.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   |
| 2.   | 2.   | 2.   | 2.   | 2.   | 1.   | 1.   | 1.   | 1.   | 1.   |

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME

634. 504. 197. 72. 10445.  
 18. 14. 11. 2. 296.  
 2.14 3.35 3.66 3.70  
 54.40 85.7 93.08 93.91  
 250. 39.2 428. 432.  
 308. 48.1 528. 532.

CFS  
 CMS  
 INCHES  
 MM  
 AC-FT  
 THOUS CU M

HYDROGRAPH AT STA BASIN FOR PLAN 1, RTIO 2

|      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|
| 3.   | 3.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   |
| 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   |
| 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 5.   | 4.   | 4.   | 3.   | 3.   | 2.   | 2.   | 2.   | 2.   | 1.   |
| 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 20.  | 21.  | 24.  | 32.  | 47.  | 69.  | 101. | 142. | 150. | 253. |
| 333. | 419. | 504. | 580. | 637. | 665. | 665. | 630. | 574. | 512. |
| 449. | 388. | 333. | 286. | 245. | 210. | 180. | 155. | 133. | 114. |
| 98.  | 84.  | 72.  | 65.  | 63.  | 60.  | 58.  | 55.  | 53.  | 51.  |
| 49.  | 47.  | 45.  | 43.  | 42.  | 40.  | 39.  | 37.  | 36.  | 34.  |
| 33.  | 31.  | 30.  | 29.  | 28.  | 27.  | 26.  | 25.  | 24.  | 23.  |
| 22.  | 21.  | 20.  | 19.  | 19.  | 18.  | 17.  | 16.  | 16.  | 15.  |
| 15.  | 14.  | 13.  | 13.  | 12.  | 12.  | 11.  | 11.  | 11.  | 10.  |
| 10.  | 9.   | 9.   | 8.   | 8.   | 8.   | 8.   | 7.   | 7.   | 7.   |
| 6.   | 6.   | 6.   | 6.   | 6.   | 5.   | 5.   | 5.   | 5.   | 4.   |
| 4.   | 4.   | 4.   | 4.   | 4.   | 4.   | 3.   | 3.   | 3.   | 3.   |
| 3.   | 3.   | 3.   | 3.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   |
| 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 1.   | 1.   | 1.   |

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME

665. 529. 207. 75. 10967.  
 19. 15. 6. 2. 311.  
 2.25 3.52 3.85 3.88  
 57.12 89.43 97.73 98.61  
 263. 411. 449. 453.  
 324. 507. 559. 559.

CFS  
 CMS  
 INCHES  
 MM  
 AC-FT  
 THOUS CU M

HYDROGRAPH AT STA BASIN FOR PLAN 1, RTIO 3

|    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|
| 3. | 3. | 2. | 2. | 2. | 2. | 2. | 2. | 2. | 2. |
| 2. | 2. | 2. | 2. | 2. | 2. | 2. | 2. | 2. | 2. |
| 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |
| 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. | 1. |

| 2.    | 11.  | 2.    | 10.   | 1.    | 5.    | 2.    | 7.    | 6.    | 6.    | 13.   | 14.   | 15.   |
|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3.    | 1.   | 3.    | 2.    | 2.    | 2.    | 2.    | 2.    | 2.    | 2.    | 2.    | 1.    | 1.    |
| 47.   | 51.  | 58.   | 77.   | 111.  | 131.  | 151.  | 165.  | 180.  | 195.  | 210.  | 225.  | 240.  |
| 793.  | 997. | 1195. | 1391. | 1515. | 1584. | 1584. | 1584. | 1584. | 1584. | 1584. | 1584. | 1584. |
| 1069. | 924. | 792.  | 640.  | 584.  | 501.  | 429.  | 368.  | 316.  | 271.  | 222.  | 181.  | 140.  |
| 232.  | 159. | 171.  | 155.  | 149.  | 143.  | 138.  | 132.  | 127.  | 122.  | 117.  | 112.  | 107.  |
| 117.  | 112. | 106.  | 104.  | 99.   | 95.   | 92.   | 88.   | 85.   | 81.   | 77.   | 73.   | 69.   |
| 78.   | 75.  | 72.   | 69.   | 66.   | 64.   | 61.   | 59.   | 56.   | 54.   | 51.   | 48.   | 45.   |
| 52.   | 50.  | 48.   | 46.   | 44.   | 42.   | 41.   | 39.   | 38.   | 36.   | 34.   | 32.   | 30.   |
| 35.   | 33.  | 32.   | 31.   | 29.   | 28.   | 27.   | 26.   | 25.   | 24.   | 23.   | 22.   | 21.   |
| 23.   | 22.  | 21.   | 20.   | 20.   | 19.   | 18.   | 17.   | 16.   | 15.   | 14.   | 13.   | 12.   |
| 15.   | 15.  | 14.   | 14.   | 13.   | 13.   | 12.   | 12.   | 11.   | 11.   | 10.   | 9.    | 8.    |
| 10.   | 10.  | 9.    | 9.    | 8.    | 8.    | 8.    | 8.    | 7.    | 7.    | 6.    | 5.    | 4.    |
| 7.    | 7.   | 6.    | 6.    | 6.    | 6.    | 6.    | 6.    | 5.    | 5.    | 4.    | 3.    | 2.    |
| 5.    | 4.   | 4.    | 4.    | 4.    | 4.    | 4.    | 4.    | 4.    | 4.    | 3.    | 2.    | 1.    |

PLAN 1  
RATIO 7

| PEAK  | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|-------|--------|---------|---------|--------------|
| 1584. | 1261.  | 49.     | 180.    | 26113.       |
| 45.   | 36.    | 14.     | 5.      | 739.         |
|       | 5.35   | 8.38    | 9.16    | 9.24         |
|       | 136.01 | 212.93  | 232.69  | 234.78       |
|       | 625.   | 979.    | 1061.   | 1079.        |
|       | 771.   | 1207.   | 1319.   | 1331.        |

CFS  
CMS  
INCHES  
MM  
AC-FT  
THOUS CU M

HYDROGRAPH AT STA BASIN FOR PLAN 1, RATIO 8

| 13.   | 8.    | 6.    | 4.    | 2.    | 1.    | 2.    | 7.    | 6.    | 6.    | 13.   | 14.   | 15.   |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 13.   | 12.   | 11.   | 11.   | 11.   | 10.   | 10.   | 10.   | 9.    | 9.    | 9.    | 9.    | 9.    |
| 8.    | 8.    | 7.    | 7.    | 7.    | 7.    | 7.    | 7.    | 6.    | 6.    | 6.    | 6.    | 6.    |
| 6.    | 5.    | 5.    | 5.    | 5.    | 5.    | 5.    | 5.    | 4.    | 4.    | 4.    | 4.    | 4.    |
| 4.    | 5.    | 12.   | 17.   | 17.   | 22.   | 26.   | 28.   | 28.   | 26.   | 26.   | 26.   | 26.   |
| 23.   | 20.   | 17.   | 15.   | 13.   | 11.   | 10.   | 9.    | 9.    | 8.    | 7.    | 7.    | 7.    |
| 6.    | 5.    | 4.    | 4.    | 4.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    |
| 3.    | 5.    | 16.   | 26.   | 26.   | 38.   | 50.   | 63.   | 75.   | 86.   | 86.   | 86.   | 86.   |
| 94.   | 102.  | 117.  | 153.  | 221.  | 329.  | 481.  | 675.  | 906.  | 1207. | 1207. | 1207. | 1207. |
| 1586. | 1995. | 2395. | 2762. | 3031. | 3168. | 3161. | 2998. | 2733. | 2439. | 2439. | 2439. | 2439. |
| 2138. | 1848. | 1586. | 1361. | 1167. | 1001. | 859.  | 737.  | 632.  | 542.  | 542.  | 542.  | 542.  |
| 465.  | 399.  | 342.  | 311.  | 298.  | 286.  | 275.  | 264.  | 254.  | 244.  | 244.  | 244.  | 244.  |
| 234.  | 225.  | 216.  | 207.  | 199.  | 191.  | 183.  | 176.  | 169.  | 162.  | 162.  | 162.  | 162.  |
| 150.  | 150.  | 144.  | 138.  | 133.  | 127.  | 122.  | 117.  | 113.  | 108.  | 108.  | 108.  | 108.  |
| 109.  | 100.  | 96.   | 92.   | 88.   | 85.   | 82.   | 78.   | 75.   | 72.   | 72.   | 72.   | 72.   |
| 69.   | 67.   | 64.   | 61.   | 59.   | 57.   | 54.   | 52.   | 50.   | 48.   | 48.   | 48.   | 48.   |
| 46.   | 44.   | 42.   | 41.   | 39.   | 38.   | 36.   | 35.   | 32.   | 32.   | 32.   | 32.   | 32.   |
| 31.   | 30.   | 28.   | 27.   | 26.   | 25.   | 24.   | 23.   | 22.   | 21.   | 21.   | 21.   | 21.   |
| 21.   | 20.   | 19.   | 18.   | 17.   | 17.   | 16.   | 15.   | 15.   | 14.   | 14.   | 14.   | 14.   |
| 14.   | 13.   | 12.   | 12.   | 12.   | 11.   | 11.   | 10.   | 10.   | 10.   | 10.   | 10.   | 10.   |
| 9.    | 9.    | 8.    | 8.    | 8.    | 7.    | 7.    | 7.    | 7.    | 7.    | 7.    | 7.    | 7.    |

| PEAK  | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|-------|--------|---------|---------|--------------|
| 2168. | 2521.  | 987.    | 359.    | 52226.       |
| 90.   | 71.    | 26.     | 10.     | 1479.        |
|       | 10.71  | 16.77   | 18.32   | 18.49        |
|       | 272.02 | 425.16  | 465.38  | 469.56       |
|       | 1250.  | 1951.   | 2139.   | 2158.        |
|       | 1542.  | 2414.   | 2638.   | 2662.        |

CFS  
CMS  
INCHES  
MM  
AC-FT  
THOUS CU M

| ROUTED OUTFLOW - DAM - SPILLWAY ELEV 263-USGS |       |       |       |      |      |       |        |       |  | FLASHBOARDS OUT |  |
|-----------------------------------------------|-------|-------|-------|------|------|-------|--------|-------|--|-----------------|--|
| ISTAQ                                         | ICOMP | TECON | ITAPE | JPLT | JPRT | INAME | ISTAGE | IAUTO |  |                 |  |
| DAM                                           | 1     | 0     | J     | 0    | 0    | 1     | 0      | 0     |  |                 |  |

|       | GLOSS            | CLOSE            | AVG              | IRES             | ISAM             | IOPT   | IPMP   | LSTP             |        |
|-------|------------------|------------------|------------------|------------------|------------------|--------|--------|------------------|--------|
|       | 0.               | 0.               | 0.               | 1                |                  | 0      | 0      | 0                |        |
|       | NSTFS            | NSIDL            | LAG              | ANSKK            | X                | ISK    | STORA  | ISPRAI           |        |
|       | 1                | 0                | 0                | 0.               | 0.               | 0.     | -263.  | -1               |        |
| STAGE | 263.00<br>266.50 | 263.10<br>267.00 | 263.20<br>268.00 | 263.50<br>268.00 | 264.00<br>268.50 | 264.50 | 264.59 | 265.00<br>265.50 | 266.00 |
| FLOW  | 0.<br>330.00     | 4.50<br>332.50   | 13.90<br>233.00  | 55.00<br>340.00  | 156.00<br>343.00 | 289.00 | 316.00 | 320.00<br>324.00 | 327.00 |

CAPACITY= 201. 122.

ELEVATION= 263. 269.

| CREL  | SFWD | COQH | EXPU | FLEVL | CJOL | CAREA | EXPL |
|-------|------|------|------|-------|------|-------|------|
| 263.0 | 0.   | 0.   | 0.   | 0.    | 0.   | 0.    | 0.   |

| DIM DATA |      |              |
|----------|------|--------------|
| TYPEL    | COQD | EXPD • DAMWD |
| 268.5    | 2.0  | 1.5 380.     |

STATION CAN, PLAN 1, RATIC 1

### END-OF-PERIOD HYDROGRAPH ORDINATES

[illegible]

**STORAGE:**

[illegible][illegible]

| PEAK       | OUTFLOW IS | 342. AT TIME | 46.50 HOURS | PEAK  | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|------------|------------|--------------|-------------|-------|--------|---------|---------|--------------|
| CFS        |            | 342.         |             | 338.  |        | 196.    | 72.     | 10425.       |
| CMS        |            | 10.          |             | 10.   |        | 6.      | 2.      | 295.         |
| INCHES     |            |              |             | 1.44  |        | 3.23    | 3.66    | 3.69         |
| MM         |            |              |             | 36.48 |        | 84.06   | 92.90   | 53.73        |
| AC-FT      |            |              |             | 168.  |        | 389.    | 427.    | 431.         |
| THOUS CU M |            |              |             | 207.  |        | 480.    | 527.    | 531.         |

| STATION DATA PLAN 1. RATIO 2.      |         |    |    |    |    |    |
|------------------------------------|---------|----|----|----|----|----|
| END-OF-PERIOD HYDROGRAPH ORDINATES |         |    |    |    |    |    |
|                                    | OUTFLOW |    |    |    |    |    |
| 0.                                 | 0.      | 1. | 1. | 1. | 1. | 1. |
| 1.                                 | 1.      | 1. | 1. | 1. | 1. | 1. |
| 1.                                 | 1.      | 1. | 1. | 1. | 1. | 1. |
| 1.                                 | 1.      | 1. | 1. | 1. | 1. | 1. |



MM  
AC-FT  
THOUS CL M

49.03 105.42 116.14 117.16  
225. 487. 534. 538.  
278. 600. 658. 664.

STATION DAY, PLAN 1, RATIO 7

END-OF-PERIOD HYDROGRAPH ORDINATES

|       |      | OUTFLOW |      |       |       |       |       |       |       |       |       |
|-------|------|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |      | 1.      | 2.   | 3.    | 4.    | 5.    | 6.    | 7.    | 8.    | 9.    | 10.   |
| 1.    | 1.   | 2.      | 3.   | 4.    | 5.    | 6.    | 7.    | 8.    | 9.    | 10.   | 11.   |
| 3.    | 3.   | 3.      | 3.   | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    |
| 3.    | 3.   | 3.      | 3.   | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    |
| 3.    | 3.   | 3.      | 3.   | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    |
| 9.    | 9.   | 9.      | 9.   | 9.    | 9.    | 9.    | 9.    | 9.    | 9.    | 9.    | 9.    |
| 6.    | 6.   | 6.      | 6.   | 6.    | 6.    | 6.    | 6.    | 6.    | 6.    | 6.    | 6.    |
| 3.    | 3.   | 3.      | 3.   | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    | 3.    |
| 26.   | 31.  | 37.     | 44.  | 55.   | 81.   | 120.  | 178.  | 265.  | 319.  | 343.  | 366.  |
| 324.  | 331. | 340.    | 340. | 1519. | 1555. | 1587. | 1531. | 1414. | 1272. | 1272. | 1272. |
| 1126. | 982. | 732.    | 633. | 548.  | 475.  | 415.  | 366.  | 325.  | 322.  | 322.  | 322.  |
| 342.  | 340. | 338.    | 334. | 331.  | 329.  | 327.  | 327.  | 325.  | 322.  | 322.  | 322.  |
| 319.  | 301. | 224.    | 177. | 148.  | 132.  | 120.  | 110.  | 103.  | 56.   | 56.   | 56.   |
| 91.   | 86.  | 82.     | 78.  | 75.   | 72.   | 69.   | 66.   | 63.   | 61.   | 61.   | 61.   |
| 58.   | 56.  | 54.     | 52.  | 51.   | 49.   | 47.   | 46.   | 44.   | 42.   | 42.   | 42.   |
| 41.   | 39.  | 38.     | 36.  | 35.   | 34.   | 32.   | 31.   | 30.   | 29.   | 29.   | 29.   |
| 27.   | 26.  | 25.     | 24.  | 23.   | 22.   | 21.   | 21.   | 20.   | 19.   | 19.   | 19.   |
| 18.   | 18.  | 17.     | 16.  | 15.   | 14.   | 14.   | 14.   | 13.   | 13.   | 13.   | 13.   |
| 13.   | 12.  | 11.     | 11.  | 11.   | 11.   | 10.   | 10.   | 10.   | 9.    | 9.    | 9.    |
| 9.    | 9.   | 8.      | 8.   | 8.    | 7.    | 7.    | 7.    | 6.    | 6.    | 6.    | 6.    |
| 6.    | 6.   | 5.      | 5.   | 5.    | 5.    | 5.    | 5.    | 5.    | 4.    | 4.    | 4.    |

STORAGE

|      |      | STORAGE |      |      |      |      |      |      |      |      |      |
|------|------|---------|------|------|------|------|------|------|------|------|------|
|      |      | 1.      | 2.   | 3.   | 4.   | 5.   | 6.   | 7.   | 8.   | 9.   | 10.  |
| 201. | 201. | 202.    | 202. | 202. | 202. | 202. | 202. | 202. | 202. | 202. | 202. |
| 202. | 202. | 203.    | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. |
| 202. | 202. | 202.    | 202. | 202. | 202. | 202. | 202. | 202. | 202. | 202. | 202. |
| 202. | 202. | 202.    | 202. | 202. | 202. | 202. | 202. | 202. | 202. | 202. | 202. |
| 204. | 204. | 204.    | 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. |
| 203. | 203. | 203.    | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. |
| 202. | 202. | 203.    | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. |
| 207. | 208. | 210.    | 212. | 215. | 219. | 225. | 232. | 242. | 252. | 262. | 272. |

|      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 257. | 281. | 312. | 338. | 346. | 347. | 347. | 347. | 347. | 347. | 347. | 347. |
| 341. | 338. | 336. | 334. | 332. | 330. | 328. | 326. | 324. | 321. | 318. | 315. |
| 318. | 312. | 306. | 299. | 291. | 284. | 276. | 268. | 260. | 251. | 242. | 233. |
| 243. | 235. | 225. | 225. | 222. | 220. | 219. | 218. | 217. | 217. | 217. | 217. |
| 216. | 215. | 215. | 215. | 214. | 214. | 214. | 213. | 213. | 213. | 213. | 213. |
| 212. | 212. | 212. | 212. | 211. | 211. | 211. | 211. | 210. | 210. | 210. | 210. |
| 210. | 209. | 205. | 209. | 209. | 209. | 208. | 208. | 208. | 208. | 208. | 208. |
| 208. | 207. | 207. | 207. | 207. | 207. | 206. | 206. | 206. | 206. | 206. | 206. |
| 206. | 206. | 206. | 206. | 206. | 206. | 205. | 205. | 205. | 205. | 205. | 205. |
| 205. | 205. | 205. | 205. | 205. | 205. | 205. | 205. | 205. | 205. | 205. | 205. |
| 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. | 204. |
| 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. | 203. |

STAGE

|       |       | STAGE |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |       | 1.    | 2.    | 3.    | 4.    | 5.    | 6.    | 7.    | 8.    | 9.    | 10.   |
| 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 | 263.0 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |



|     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 36. | 35. | 34. | 33. | 32. | 31. | 30. | 29. | 28. | 27. | 26. | 25. |
| 16. | 16. | 15. | 14. | 14. | 14. | 13. | 13. | 13. | 12. | 12. | 12. |
| 11. | 11. | 11. | 10. | 10. | 10. | 10. | 9.  | 9.  | 8.  | 8.  | 8.  |

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 201. | 202. | 203. | 204. | 205. | 206. | 207. | 208. | 209. | 210. | 211. | 212. | 213. | 214. | 215. | 216. | 217. | 218. | 219. | 220. | 221. | 222. | 223. | 224. | 225. | 226. | 227. | 228. | 229. | 230. | 231. | 232. | 233. | 234. | 235. | 236. | 237. | 238. | 239. | 240. | 241. | 242. | 243. | 244. | 245. | 246. | 247. | 248. | 249. | 250. | 251. | 252. | 253. | 254. | 255. | 256. | 257. | 258. | 259. | 260. | 261. | 262. | 263. | 264. | 265. | 266. | 267. | 268. | 269. | 270. | 271. | 272. | 273. | 274. | 275. | 276. | 277. | 278. | 279. | 280. | 281. | 282. | 283. | 284. | 285. | 286. | 287. | 288. | 289. | 290. | 291. | 292. | 293. | 294. | 295. | 296. | 297. | 298. | 299. | 300. |
| 201. | 202. | 203. | 204. | 205. | 206. | 207. | 208. | 209. | 210. | 211. | 212. | 213. | 214. | 215. | 216. | 217. | 218. | 219. | 220. | 221. | 222. | 223. | 224. | 225. | 226. | 227. | 228. | 229. | 230. | 231. | 232. | 233. | 234. | 235. | 236. | 237. | 238. | 239. | 240. | 241. | 242. | 243. | 244. | 245. | 246. | 247. | 248. | 249. | 250. | 251. | 252. | 253. | 254. | 255. | 256. | 257. | 258. | 259. | 260. | 261. | 262. | 263. | 264. | 265. | 266. | 267. | 268. | 269. | 270. | 271. | 272. | 273. | 274. | 275. | 276. | 277. | 278. | 279. | 280. | 281. | 282. | 283. | 284. | 285. | 286. | 287. | 288. | 289. | 290. | 291. | 292. | 293. | 294. | 295. | 296. | 297. | 298. | 299. | 300. |
| 201. | 202. | 203. | 204. | 205. | 206. | 207. | 208. | 209. | 210. | 211. | 212. | 213. | 214. | 215. | 216. | 217. | 218. | 219. | 220. | 221. | 222. | 223. | 224. | 225. | 226. | 227. | 228. | 229. | 230. | 231. | 232. | 233. | 234. | 235. | 236. | 237. | 238. | 239. | 240. | 241. | 242. | 243. | 244. | 245. | 246. | 247. | 248. | 249. | 250. | 251. | 252. | 253. | 254. | 255. | 256. | 257. | 258. | 259. | 260. | 261. | 262. | 263. | 264. | 265. | 266. | 267. | 268. | 269. | 270. | 271. | 272. | 273. | 274. | 275. | 276. | 277. | 278. | 279. | 280. | 281. | 282. | 283. | 284. | 285. | 286. | 287. | 288. | 289. | 290. | 291. | 292. | 293. | 294. | 295. | 296. | 297. | 298. | 299. | 300. |

STORAGE

|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       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| 263.0 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------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STAGE

PEAK OUTFLOW IS 3171. AT TIME 43.51 HOURS

| PEAK  | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|-------|--------|---------|---------|--------------|
| 2171. | 2509.  | 981.    | 359.    | 52165.       |
| 90.   | 71.    | 28.     | 10.     | 1477.        |
| CFS   | INCHES | INCHES  | INCHES  | INCHES       |
|       | 10.66  | 16.68   | 18.31   | 18.46        |

MM  
AC-FT  
THOUS CU M

270.67 423.55 465.07 469.01  
1244. 1947. 2137. 2156.  
1534. 2401. 2637. 2659.

[illegible]

## REACH 1 DAM TO 210 .

[illegible]

| Variable                  | Mean | SD   | Min  | Max  | Skewness | Kurtosis | Normality |
|---------------------------|------|------|------|------|----------|----------|-----------|
| Age                       | 35.2 | 12.5 | 18   | 65   | 0.15     | 3.2      | 0.98      |
| Gender                    | 1.2  | 0.4  | 1    | 2    | 0.05     | 2.1      | 0.99      |
| Education                 | 12.5 | 2.1  | 9    | 16   | 0.2      | 3.5      | 0.97      |
| Income                    | 4500 | 1500 | 2000 | 8000 | 0.3      | 3.8      | 0.96      |
| Marital Status            | 1.5  | 0.5  | 1    | 2    | 0.02     | 2.0      | 0.99      |
| Occupation                | 2.5  | 1.2  | 1    | 4    | 0.1      | 3.0      | 0.98      |
| Health Status             | 1.8  | 0.6  | 1    | 2    | 0.08     | 2.5      | 0.99      |
| Stress Level              | 3.2  | 1.5  | 1    | 5    | 0.25     | 4.0      | 0.95      |
| Life Satisfaction         | 4.1  | 1.2  | 2    | 6    | 0.18     | 3.3      | 0.97      |
| Resilience Score          | 2.8  | 1.0  | 1    | 4    | 0.12     | 3.1      | 0.98      |
| Emotional Stability       | 3.5  | 1.1  | 2    | 5    | 0.22     | 3.9      | 0.96      |
| Work-Life Balance         | 3.8  | 1.3  | 2    | 5    | 0.15     | 3.4      | 0.97      |
| Family Support            | 4.3  | 1.0  | 3    | 5    | 0.05     | 2.8      | 0.99      |
| Community Involvement     | 2.1  | 0.8  | 1    | 3    | 0.1      | 3.0      | 0.98      |
| Personal Growth           | 3.9  | 1.2  | 2    | 5    | 0.18     | 3.3      | 0.97      |
| Financial Stability       | 3.6  | 1.1  | 2    | 5    | 0.15     | 3.4      | 0.97      |
| Physical Health           | 3.1  | 1.0  | 2    | 4    | 0.12     | 3.1      | 0.98      |
| Mental Health             | 3.4  | 1.1  | 2    | 4    | 0.15     | 3.2      | 0.97      |
| Social Skills             | 3.7  | 1.0  | 2    | 4    | 0.1      | 3.0      | 0.98      |
| Self-Esteem               | 4.0  | 1.1  | 3    | 5    | 0.08     | 2.9      | 0.99      |
| Life Goals Achievement    | 3.3  | 1.2  | 2    | 4    | 0.15     | 3.3      | 0.97      |
| Relationship Satisfaction | 4.2  | 1.0  | 3    | 5    | 0.05     | 2.8      | 0.99      |
| Work Satisfaction         | 3.5  | 1.1  | 2    | 4    | 0.12     | 3.1      | 0.98      |
| Overall Well-being        | 3.8  | 1.2  | 2    | 5    | 0.18     | 3.4      | 0.96      |

CROSS SECTION COORDINATES--SIA,ELEV,SIA,ELEV--ETC

| FLOW | 0.      | 16.49   | 50.18   | 94.79   | 149.07   | 277.48   | 624.39   | 1260.50  | 2104.40  | 3135.55  |
|------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|
| FLOW | 4341.95 | 5314.83 | 7248.36 | 8938.16 | 10780.95 | 12774.26 | 14916.23 | 17205.48 | 19839.00 | 22046.21 |

OUTFILE

|     |      |      |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|------|------|
| 0.  | 0.   | 0.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.  | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.  | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.  | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 3.  | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   |
| 3.  | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   |
| 3.  | 1.   | 1.   | 1.   | 2.   | 2.   | 2.   | 3.   | 4.   | 5.   |
| 6.  | 8.   | 16.  | 12.  | 15.  | 22.  | 34.  | 50.  | 79.  | 116. |
| 60. | 210. | 275. | 318. | 322. | 325. | 329. | 332. | 336. | 338. |
| 40. | 331. | 342. | 341. | 341. | 339. | 338. | 335. | 333. | 331. |
| 28. | 326. | 322. | 318. | 266. | 192. | 141. | 103. | 89.  | 76.  |
| 68. | 61.  | 56.  | 52.  | 50.  | 48.  | 46.  | 44.  | 42.  | 40.  |



MAXIMUM STORAGE = 7.

MAXIMUM STAGE IS 212.7

STATION 32K, PLAN 1, RTIO 2

**OUTFLOW**

[illegible]

**STOR**

[illegible]

[illegible][illegible]

|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------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| 212.8 | 212.8 | 212.8 | 212.8 | 212.8 | 212.8 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 | 212.7 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

|            | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL | VOLUME |
|------------|------|--------|---------|---------|-------|--------|
| CFS        | 392. | 351.   | 206.    | 75.     |       | 10944. |
| CMS        | 11.  | 10.    | 6.      | 2.      |       | 310.   |
| INCHES     |      | 1.49   | 3.50    | 3.84    |       | 310.   |
| MM         |      | 37.89  | 89.0    | 97.55   |       | 98.40  |
| AC-FT      |      | 174.   | 409.    | 448.    |       | 452.   |
| THOUS CU M |      | 215.   | 504.    | 553.    |       | 558.   |

MAXIMUM STORAGE = 8.

MAXIMUM STAGE IS 212.8

STATION 32K, PLAN 1, RTIO 3[illegible]

SECTION 1000 - 1000.00

OUTFLOW

|    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 28. | 29. | 30. | 31. | 32. | 33. | 34. | 35. | 36. | 37. | 38. | 39. | 40. | 41. | 42. | 43. | 44. | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | 57. | 58. | 59. | 60. | 61. | 62. | 63. | 64. | 65. | 66. | 67. | 68. | 69. | 70. | 71. | 72. | 73. | 74. | 75. | 76. | 77. | 78. | 79. | 80. | 81. | 82. | 83. | 84. | 85. | 86. | 87. | 88. | 89. | 90. | 91. | 92. | 93. | 94. | 95. | 96. | 97. | 98. | 99. | 100. |
| 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 28. | 29. | 30. | 31. | 32. | 33. | 34. | 35. | 36. | 37. | 38. | 39. | 40. | 41. | 42. | 43. | 44. | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | 57. | 58. | 59. | 60. | 61. | 62. | 63. | 64. | 65. | 66. | 67. | 68. | 69. | 70. | 71. | 72. | 73. | 74. | 75. | 76. | 77. | 78. | 79. | 80. | 81. | 82. | 83. | 84. | 85. | 86. | 87. | 88. | 89. | 90. | 91. | 92. | 93. | 94. | 95. | 96. | 97. | 98. | 99. | 100. |

PLAN 1  
RATIO 7

STOR

|    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 28. | 29. | 30. | 31. | 32. | 33. | 34. | 35. | 36. | 37. | 38. | 39. | 40. | 41. | 42. | 43. | 44. | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | 57. | 58. | 59. | 60. | 61. | 62. | 63. | 64. | 65. | 66. | 67. | 68. | 69. | 70. | 71. | 72. | 73. | 74. | 75. | 76. | 77. | 78. | 79. | 80. | 81. | 82. | 83. | 84. | 85. | 86. | 87. | 88. | 89. | 90. | 91. | 92. | 93. | 94. | 95. | 96. | 97. | 98. | 99. | 100. |
| 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 28. | 29. | 30. | 31. | 32. | 33. | 34. | 35. | 36. | 37. | 38. | 39. | 40. | 41. | 42. | 43. | 44. | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | 57. | 58. | 59. | 60. | 61. | 62. | 63. | 64. | 65. | 66. | 67. | 68. | 69. | 70. | 71. | 72. | 73. | 74. | 75. | 76. | 77. | 78. | 79. | 80. | 81. | 82. | 83. | 84. | 85. | 86. | 87. | 88. | 89. | 90. | 91. | 92. | 93. | 94. | 95. | 96. | 97. | 98. | 99. | 100. |

STAGE

|    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 28. | 29. | 30. | 31. | 32. | 33. | 34. | 35. | 36. | 37. | 38. | 39. | 40. | 41. | 42. | 43. | 44. | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | 57. | 58. | 59. | 60. | 61. | 62. | 63. | 64. | 65. | 66. | 67. | 68. | 69. | 70. | 71. | 72. | 73. | 74. | 75. | 76. | 77. | 78. | 79. | 80. | 81. | 82. | 83. | 84. | 85. | 86. | 87. | 88. | 89. | 90. | 91. | 92. | 93. | 94. | 95. | 96. | 97. | 98. | 99. | 100. |
| 0. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 28. | 29. | 30. | 31. | 32. | 33. | 34. | 35. | 36. | 37. | 38. | 39. | 40. | 41. | 42. | 43. | 44. | 45. | 46. | 47. | 48. | 49. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | 57. | 58. | 59. | 60. | 61. | 62. | 63. | 64. | 65. | 66. | 67. | 68. | 69. | 70. | 71. | 72. | 73. | 74. | 75. | 76. | 77. | 78. | 79. | 80. | 81. | 82. | 83. | 84. | 85. | 86. | 87. | 88. | 89. | 90. | 91. | 92. | 93. | 94. | 95. | 96. | 97. | 98. | 99. | 100. |



STATION 32K, PL411, RTIO.8

OUTFLOW

|       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.    | 1.    | 2.    | 3.    | 4.    | 5.    | 6.    | 7.    |
| 7.    | 7.    | 7.    | 8.    | 8.    | 7.    | 7.    | 7.    |
| 7.    | 7.    | 6.    | 6.    | 6.    | 6.    | 5.    | 5.    |
| 5.    | 5.    | 5.    | 5.    | 8.    | 10.   | 14.   | 17.   |
| 20.   | 20.   | 20.   | 19.   | 17.   | 16.   | 14.   | 13.   |
| 12.   | 11.   | 10.   | 9.    | 8.    | 7.    | 6.    | 6.    |
| 5.    | 5.    | 5.    | 5.    | 9.    | 14.   | 33.   | 43.   |
| 53.   | 68.   | 75.   | 94.   | 113.  | 216.  | 322.  | 330.  |
| 477.  | 1445. | 2341. | 2518. | 3100. | 3182. | 2866. | 2579. |
| 2285. | 1999. | 1734. | 1489. | 1119. | 963.  | 716.  | 620.  |
| 551.  | 479.  | 418.  | 372.  | 338.  | 342.  | 340.  | 339.  |
| 338.  | 337.  | 335.  | 334.  | 332.  | 329.  | 326.  | 324.  |
| 322.  | 319.  | 296.  | 251.  | 210.  | 160.  | 134.  | 128.  |
| 121.  | 115.  | 110.  | 105.  | 101.  | 93.   | 85.   | 82.   |
| 79.   | 76.   | 72.   | 70.   | 67.   | 62.   | 57.   | 55.   |
| 53.   | 51.   | 50.   | 48.   | 47.   | 43.   | 40.   | 39.   |
| 37.   | 36.   | 34.   | 33.   | 32.   | 29.   | 27.   | 26.   |
| 25.   | 24.   | 22.   | 21.   | 20.   | 19.   | 18.   | 17.   |
| 17.   | 16.   | 16.   | 15.   | 14.   | 13.   | 13.   | 12.   |
| 12.   | 11.   | 11.   | 11.   | 10.   | 10.   | 9.    | 9.    |

STOR

|     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |
| 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  |
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |
| 1.  | 1.  | 2.  | 2.  | 3.  | 4.  | 7.  | 7.  |
| 10. | 24. | 32. | 34. | 39. | 40. | 37. | 34. |
| 32. | 29. | 26. | 24. | 20. | 18. | 14. | 13. |
| 12. | 10. | 9.  | 8.  | 7.  | 7.  | 7.  | 7.  |
| 7.  | 7.  | 7.  | 7.  | 7.  | 7.  | 7.  | 7.  |
| 7.  | 7.  | 6.  | 5.  | 4.  | 3.  | 2.  | 2.  |
| 2.  | 2.  | 2.  | 2.  | 2.  | 2.  | 2.  | 2.  |
| 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  |
| 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  |
| 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  |
| 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  | 1.  |
| 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  | 0.  |

STAGE

|       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 210.0 | 210.0 | 210.1 | 210.1 | 210.1 | 210.2 | 210.2 | 210.2 |
| 210.2 | 210.2 | 210.2 | 210.2 | 210.2 | 210.2 | 210.2 | 210.2 |
| 210.2 | 210.2 | 210.2 | 210.2 | 210.2 | 210.2 | 210.2 | 210.2 |
| 210.6 | 210.6 | 210.6 | 210.6 | 210.5 | 210.5 | 210.4 | 210.4 |
| 210.4 | 210.4 | 210.3 | 210.3 | 210.3 | 210.2 | 210.2 | 210.2 |
| 210.2 | 210.2 | 210.2 | 210.2 | 210.3 | 210.6 | 210.8 | 210.5 |
| 211.1 | 211.2 | 211.4 | 211.6 | 212.1 | 212.4 | 212.7 | 212.7 |
| 212.9 | 213.8 | 214.3 | 214.6 | 214.7 | 214.8 | 214.6 | 214.5 |
| 214.3 | 214.1 | 214.0 | 213.8 | 213.7 | 213.6 | 213.3 | 213.2 |
| 213.0 | 212.9 | 212.8 | 212.8 | 212.7 | 212.7 | 212.7 | 212.7 |

MAXIMUM STAG 15 214.8

.....

# HYDROGRAPH ROUTING

REACH 2 210 TO 130 LOCAL ROAD  
 ISIAO ICOPP IFCON ITAPE JPLT JPRT INAME ISTAGE IAUTC  
 8CK 1 0 0 0 0 0 0 0 0 0  
 ROUTING DATA  
 GLSS CLOSS AVG INES ISAME IOPT IPMP LSTR  
 0. 0. 0. 10000 10000 0 0 0 0  
 NSTFS NSTDL LAG ANSKC X ISK SICRA ISPRAY  
 1 0 0 0. 0. 0. 0. 0. 0.

# NORMAL DEPTH CHANNEL ROUTING

QN(1) QN(2) QN(3) ELNWT ELMAX RLNTH SEL  
 0.0400 0.0400 0.0400 130.0 145.0 4800. 0.01670

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC  
 90.00 44.00 100.00 114.10 150.00 133.00 150.00 130.00 165.00 120.00  
 165.00 133.00 215.00 114.00 225.00 144.00

| STORAGE | 0.      | 1.30    | 2.61     | 3.91     | 5.36     | 11.47    | 21.52    | 31.72    | 42.06    | 52.52    |
|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|
|         | 63.15   | 73.50   | 84.79    | 95.81    | 106.57   | 118.27   | 129.71   | 141.29   | 152.99   | 164.74   |
| OUTFLOW | 0.      | 45.55   | 136.10   | 253.06   | 393.29   | 700.11   | 1452.39  | 2544.23  | 3918.43  | 5545.97  |
|         | 7407.37 | 9488.41 | 11778.12 | 14267.76 | 16950.21 | 19819.58 | 22870.89 | 26099.92 | 29577.90 | 33447.61 |
| STAGE   | 130.00  | 130.75  | 131.58   | 132.37   | 133.16   | 133.95   | 134.74   | 135.52   | 136.32   | 137.11   |
|         | 137.89  | 138.68  | 139.47   | 140.26   | 141.05   | 141.84   | 142.63   | 143.42   | 144.21   | 145.00   |

| FLOW | 0.      | 45.55   | 136.10   | 253.06   | 393.29   | 700.11   | 1452.39  | 2544.23  | 3918.43  | 5545.97  |
|------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|
|      | 7407.37 | 9488.41 | 11778.12 | 14267.76 | 16950.21 | 19819.58 | 22870.89 | 26099.92 | 29577.90 | 33447.61 |

# STATION 80K, PLAN 1, R110.1

| OUTFLOW | 0.   | 1.   | 0.   | 0.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
|---------|------|------|------|------|------|------|------|------|------|------|
|         | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
|         | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
|         | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
|         | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   |
|         | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   |
|         | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   | 2.   |
|         | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
|         | 5.   | 5.   | 5.   | 5.   | 5.   | 5.   | 5.   | 5.   | 5.   | 5.   |
|         | 197. | 256. | 310. | 323. | 324. | 328. | 331. | 335. | 338. | 341. |
|         | 340. | 341. | 341. | 341. | 340. | 338. | 336. | 334. | 331. | 328. |
|         | 329. | 326. | 321. | 319. | 312. | 303. | 295. | 287. | 279. | 271. |
|         | 70.  | 63.  | 57.  | 54.  | 51.  | 48.  | 45.  | 42.  | 39.  | 36.  |









MAXIMUM STORAGE = 23.

STATION 80K, PLAV 1, RTIO 8

**CUTFLOW**

|      |       |       |       |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.   | 1.    | 2.    | 2.    | 3.    | 4.    | 5.    | 5.    | 6.    |
| 7.   | 7.    | 7.    | 7.    | 8.    | 7.    | 7.    | 7.    | 7.    |
| 7.   | 7.    | 6.    | 6.    | 6.    | 6.    | 6.    | 6.    | 5.    |
| 5.   | 5.    | 5.    | 5.    | 6.    | 7.    | 8.    | 10.   | 13.   |
| 18.  | 20.   | 20.   | 19.   | 19.   | 18.   | 17.   | 16.   | 14.   |
| 11.  | 11.   | 10.   | 9.    | 8.    | 8.    | 7.    | 6.    | 36.   |
| 5.   | 5.    | 5.    | 5.    | 5.    | 8.    | 11.   | 17.   | 26.   |
| 46.  | 74.   | 88.   | 109.  | 144.  | 200.  | 266.  | 317.  | 320.  |
| 20.  | 2164. | 2530. | 2824. | 3114. | 3153. | 3120. | 2904. | 2638. |
| 49.  | 1792. | 1544. | 1342. | 1170. | 1013. | 871.  | 752.  | 658.  |
| 514. | 447.  | 394.  | 348.  | 344.  | 342.  | 341.  | 340.  | 339.  |
| 38.  | 335.  | 334.  | 332.  | 331.  | 329.  | 328.  | 326.  | 324.  |
| 22.  | 303.  | 264.  | 220.  | 187.  | 165.  | 149.  | 137.  | 124.  |
| 23.  | 112.  | 107.  | 102.  | 98.   | 94.   | 90.   | 87.   | 81.   |
| 80.  | 74.   | 71.   | 68.   | 65.   | 63.   | 60.   | 58.   | 55.   |
| 54.  | 50.   | 49.   | 47.   | 45.   | 44.   | 43.   | 41.   | 40.   |
| 37.  | 35.   | 34.   | 32.   | 31.   | 30.   | 29.   | 28.   | 27.   |
| 26.  | 24.   | 23.   | 22.   | 21.   | 20.   | 19.   | 18.   | 18.   |
| 16.  | 16.   | 15.   | 15.   | 14.   | 14.   | 13.   | 13.   | 13.   |
| 12.  | 11.   | 11.   | 11.   | 10.   | 10.   | 9.    | 9.    | 9.    |

## STOR

[illegible]



# MECHANICVILLE RESERVOIR DAM NY - 1061

NO BREACH

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

| OPERATION     | STATION | AREA               | PLAN | RATIOS APPLIED TO FLOWS |                  |                  |                  |                  |                  |                   |                   |  |  |
|---------------|---------|--------------------|------|-------------------------|------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|--|--|
|               |         |                    |      | RATIO 1                 | RATIO 2          | RATIO 3          | RATIO 4          | RATIO 5          | RATIO 6          | RATIO 7           | RATIO 8           |  |  |
|               |         |                    |      | 0.20                    | 0.21             | 0.22             | 0.23             | 0.24             | 0.25             | 0.50              | 1.00              |  |  |
| HYDROGRAPH AT | BASIN   | 2.19<br>( 2540.71) | 1    | 634.<br>( 17.94)        | 665.<br>( 19.84) | 697.<br>( 19.73) | 729.<br>( 20.63) | 760.<br>( 21.53) | 792.<br>( 22.42) | 1584.<br>( 44.85) | 3168.<br>( 89.69) |  |  |
| ROUTED TO     | DAM     | 2.19<br>( 2540.71) | 1    | 342.<br>( 9.67)         | 406.<br>( 11.49) | 494.<br>( 14.00) | 573.<br>( 16.23) | 620.<br>( 17.56) | 701.<br>( 19.85) | 1587.<br>( 44.94) | 3171.<br>( 89.79) |  |  |
| ROUTED TO     | 32K     | 2.19<br>( 2540.71) | 1    | 342.<br>( 9.67)         | 392.<br>( 11.10) | 471.<br>( 13.34) | 551.<br>( 15.61) | 617.<br>( 17.47) | 684.<br>( 19.38) | 1587.<br>( 44.94) | 3182.<br>( 90.10) |  |  |
| ROUTED TO     | 80K     | 2.19<br>( 2540.71) | 1    | 342.<br>( 9.67)         | 394.<br>( 11.15) | 472.<br>( 13.36) | 529.<br>( 14.98) | 603.<br>( 17.08) | 643.<br>( 18.20) | 1587.<br>( 44.94) | 3153.<br>( 89.30) |  |  |

# SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ..... INITIAL VALUE SPILLWAY CREST TOP OF DAM  
 ELEVATION 263.00 263.00 268.50  
 STORAGE 201. 201. 322.  
 CUTFLOW 0. 0. 343.

| RATIO OF F.F. | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM CUTFLOW CFS | DURATION ONLR TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
|---------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| 0.20          | 268.27                 | 317.                  | 342.                | 0.                      | 46.50                     | 0.                    |
| 0.21          | 268.66                 | 325.                  | 406.                | 2.00                    | 46.00                     | 0.                    |
| 0.22          | 268.78                 | 328.                  | 494.                | 2.50                    | 45.50                     | 0.                    |
| 0.23          | 268.87                 | 330.                  | 573.                | 3.00                    | 45.00                     | 0.                    |
| 0.24          | 268.92                 | 331.                  | 620.                | 3.50                    | 45.00                     | 0.                    |
| 0.25          | 269.00                 | 333.                  | 701.                | 4.00                    | 44.50                     | 0.                    |
| 0.50          | 265.65                 | 347.                  | 1587.               | 8.00                    | 43.50                     | 0.                    |
| 1.00          | 270.45                 | 366.                  | 3171.               | 12.00                   | 43.50                     | 0.                    |

## PLAN 1 STATION 32K

| RATIO | MAXIMUM FLOW,CFS | MAXIMUM STAGE,FT | TIME HOURS |
|-------|------------------|------------------|------------|
| 0.20  | 342.             | 212.7            | 46.50      |
| 0.21  | 352.             | 212.8            | 46.00      |
| 0.22  | 471.             | 212.9            | 46.00      |
| 0.23  | 551.             | 213.0            | 45.50      |
| 0.24  | 617.             | 213.1            | 45.00      |
| 0.25  | 684.             | 213.2            | 45.00      |
| 0.50  | 1587.            | 213.9            | 43.00      |
| 1.00  | 3182.            | 214.8            | 43.50      |

## PLAN 1 STATION 80K

| RATIO | MAXIMUM FLOW,CFS | MAXIMUM STAGE,FT | TIME HOURS |
|-------|------------------|------------------|------------|
| 0.20  | 342.             | 132.9            | 46.50      |
| 0.21  | 394.             | 133.2            | 46.50      |
| 0.22  | 472.             | 133.4            | 46.00      |
| 0.23  | 529.             | 133.5            | 45.50      |
| 0.24  | 603.             | 133.7            | 45.50      |
| 0.25  | 643.             | 133.8            | 45.50      |
| 0.50  | 1587.            | 134.8            | 43.00      |
| 1.00  | 3153.            | 135.9            | 43.50      |

MECHANICVILLE RESERVOIR DAM  
 NY - 1061

NO BREACH

.....  
 FLOOD HYDROGRAPH PACKAGE (HEC-1)  
 DAM SAFETY VERSION JULY 1978  
 LAST MODIFICATION 26 FEB 79  
 MODIFIED FOR HONEYWELL APR 79  
 .....

.....  
 NEW YORK STATE  
 DEPT OF ENVIRONMENTAL CONSERVATION  
 FLOOD PROTECTION BUREAU  
 .....

.....  
 1 A1 NY-1061  
 2 A2  
 3 A3  
 4 B 200 0 30 0 0 0 0 0  
 5 C1 5  
 6 J 1 8 1  
 7 J1 0.20 0.21 0.22 0.23 0.24 0.25 0.50 1  
 8 K 0 BASIN  
 9 K1  
 10 M 1 1 2.15 2.19 1  
 11 P 19 111 123 132 142  
 12 I  
 13 N 3.61 0.625  
 14 X -6 -0.1 1.5  
 15 K 1 DAM  
 16 K1  
 17 Y  
 18 Y1 1  
 19 Y4 263 263.1 263.2 263.5 264.0 264.5 264.59 265.0 265.5 266.0  
 20 Y4 266.5 266.85 267.0 268.0 268.5  
 21 Y5 0 4.9 13.9 55 156 285 316 320 324 327  
 22 Y5 330 332 333 340 343  
 23 \$S 0 201 322  
 24 \$E 236 243 248.5  
 25 \$S 263  
 26 \$D 268.5 2.63 1.5 380  
 27 \$B 30 0.5 252 0.5 263 238.6  
 28 K 1 32K  
 29 K1  
 30 Y

.....  
 UPPER HUDSON RIVER BASIN  
 SARATOGA COUNTY  
 SNYDER UN  
 0 0 0 0 0 0 0 0 0 0

INFLO HYDROGRAPH -- DAM

ROUTED OUTFLOW - DAM - SPILLWAY ELEV 263-USGS FLASHBOARDS OUT

REACH 1 DAM TO 210

[illegible]

NEW YORK STATE  
DEPT OF ENVIRONMENTAL CONSERVATION  
FLOOD PROTECTION BUREAU

FLOOD HYDROGRAPH PACKAGE (HEC-1)  
GAP SAFETY VERSION JULY 1976  
LAST MODIFICATION 26 FEB 79  
MODIFIED FOR HONEYWELL APR 79

RUN DATE 05/26/81 NY-10-1 MECHANICVILLE RESERVOIR DAM  
DEC 22/A-142 UN -- PLUM BROOK  
CITY WATER SUPPLY  
UPPER HUDSON RIVER BASIN  
SARATOGA COUNTY  
SNYDER UN

JOB SPECIFICATION  
NO NHR NPIN ICAY IHR IWIN METRC IPLT IPRT NSTAN  
200 0 30 0 0 0 0 0 0 0 0  
JOPER NWT LROPT TRACE  
5 0 0 0

MULTI-PLAN ANALYSES TO BE PERFORMED  
NPLAN= 1 RTIO= 8 LRIO= 1  
RTIOS= 0.20 0.21 0.22 0.23 0.24 0.25 0.50 1.00

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH -- DAM  
ISTAQ ICOPP IECON IIAPE JPLT JFRT INAME ISTAGE IAUIO  
BASIN 0 0 0 0 0 0 0 0 0 0

HYDROGRAPH DATA  
IHYDG ICHG TAREA SNAP TRSDA TRSPC RATIO ISVOW ISANE LOCAL  
1 1 2.19 0. 2.19 0. 0. 0 0 1 0

PRECIP DATA  
SPFE PFS R6 R12 R24 R48 R72 R96  
0. 19.00 111.00 123.00 132.00 142.00 0. 0.

INSPEC COMPUTED BY THE PROGRAM IS 0.800

LOSS DATA  
LROPT STRKR OLTKR RTICK ERAIN STRKS RTICK STRYL CNSTL ALSHX RTIMP  
0 0. 0. 1.00 0. 0. 1.00 1.00 0.20 0. 0.

UNIT HYDROGRAPH DATA  
IPE 3.61 CP=0.61 NTA= 0

RECESSION DATA  
STRIO= -6.00 GRCSN= -0.10 RTIO= 1.50  
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND IP ARE 7C= 8.20 AND RE 0.33 INTERVALS

UNIT HYDROGRAPH 39 END-OF-PERIOD ORIGINATES, LAG= 3.58 HOURS, CP= 0.63 VOL= 1.00  
12. 45. 85. 139. 188. 226. 247. 250. 231. 197.  
171. 145. 126. 108. 92. 79. 68. 58. 50. 43.  
37. 32. 27. 23. 20. 17. 15. 13. 11. 9.  
8. 7. 6. 5. 4. 4. 3. 3. 2. 2.

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q ENG-OF-PERIOD FLOW  
0 MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

ROUTED OUTFLOW - DAM - SPILLWAY ELEV 263-USGS FLASHBOARDS OUT

| ISTAU | ICCNF | IFCON | IYAPE | JPLY | JPRY | INAME | ISTAGE | IAUTC |
|-------|-------|-------|-------|------|------|-------|--------|-------|
| QAM   | 1     | 0     | 0     | 0    | 0    | 1     | 0      | 0     |

# ROUTING DATA

| GLASS | CLOSS | AVG | IR5 | ISAME | IUPT | IPMP | LSTR |
|-------|-------|-----|-----|-------|------|------|------|
| 0.    | 0.    | 0.  | 1   | 1     | 0    | 0    | 0    |

| NSTFS | NSYDL | LAG | AMS KK | X  | TSK | SYDRA | ISPRAT |
|-------|-------|-----|--------|----|-----|-------|--------|
| 1     | 0     | 0   | 0.     | 0. | 0.  | -263. | -1     |

| SLACK | 203.00 | 203.10 | 203.20 | 203.30 | 204.00 | 204.50 | 205.00 | 205.50 |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| SLACK | 203.00 | 203.10 | 203.20 | 203.30 | 204.00 | 204.50 | 205.00 | 205.50 |

|     |    |      |       |       |        |        |        |        |
|-----|----|------|-------|-------|--------|--------|--------|--------|
| FLY | 0. | 4.90 | 13.50 | 55.00 | 289.00 | 316.00 | 320.00 | 321.00 |
|-----|----|------|-------|-------|--------|--------|--------|--------|

|           |    |      |      |
|-----------|----|------|------|
| CAPACITY= | 0. | 201. | 322. |
|-----------|----|------|------|

|             |      |      |      |
|-------------|------|------|------|
| ELEVATION:- | 235. | 263. | 269. |
|-------------|------|------|------|

| CREL | SFLID | COGW | EXPM | ELEV | COQL | CAREA | EXPL |
|------|-------|------|------|------|------|-------|------|
| 26.0 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  |

| DAM DATA |       |      |        |
|----------|-------|------|--------|
| TYPEL    | COORD | EXPD | DAMWID |
| 268.5    | 2.6   | 1.5  | 380.   |

| BPWIC | Z    | ELOM   | YFAIL | WSEL   | FAILEL |
|-------|------|--------|-------|--------|--------|
| 30.   | 0.50 | 252.00 | 0.50  | 263.00 | 263.60 |

STATION DAM, PLAN 1, RATIO 1

# END-OF-PERIOD HYDROGRAPH ORDINATES

## GUIFLOW

[illegible]







THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.010 HOURS DURING BREACH FORMATION. DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 0.00 HOURS. THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH. INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

| TIME<br>(HOURS) | TIME FROM<br>BEGINNING<br>OF BREACH<br>(HOURS) | INTERPOLATED<br>BREACH<br>HYDROGRAPH<br>(CFS) | COMPUTED<br>BREACH<br>HYDROGRAPH<br>(CFS) | ERROR<br>(CFS) | ACCUMULATED<br>ERROR<br>(CFS) | ACCUMULATED<br>ERROR<br>(AC-F) |
|-----------------|------------------------------------------------|-----------------------------------------------|-------------------------------------------|----------------|-------------------------------|--------------------------------|
| 45.500          | 0.                                             | 379.                                          | 379.                                      | 0.             | 0.                            | 0.                             |
| 45.510          | 0.010                                          | 474.                                          | 407.                                      | 57.            | 57.                           | 0.                             |
| 45.520          | 0.020                                          | 509.                                          | 443.                                      | 126.           | 193.                          | 0.                             |
| 45.530          | 0.030                                          | 665.                                          | 488.                                      | 177.           | 370.                          | 0.                             |
| 45.540          | 0.040                                          | 760.                                          | 529.                                      | 221.           | 591.                          | 0.                             |
| 45.550          | 0.050                                          | 855.                                          | 596.                                      | 260.           | 851.                          | 1.                             |
| 45.560          | 0.060                                          | 951.                                          | 657.                                      | 294.           | 1144.                         | 1.                             |
| 45.570          | 0.070                                          | 1046.                                         | 722.                                      | 324.           | 1468.                         | 1.                             |
| 45.580          | 0.080                                          | 1141.                                         | 792.                                      | 350.           | 1818.                         | 2.                             |
| 45.590          | 0.090                                          | 1236.                                         | 865.                                      | 372.           | 2189.                         | 2.                             |
| 45.600          | 0.100                                          | 1332.                                         | 941.                                      | 390.           | 2580.                         | 2.                             |
| 45.610          | 0.110                                          | 1427.                                         | 1022.                                     | 405.           | 2985.                         | 2.                             |
| 45.620          | 0.120                                          | 1522.                                         | 1109.                                     | 414.           | 3398.                         | 3.                             |
| 45.630          | 0.130                                          | 1618.                                         | 1201.                                     | 416.           | 3815.                         | 3.                             |
| 45.640          | 0.140                                          | 1713.                                         | 1297.                                     | 410.           | 4231.                         | 3.                             |
| 45.650          | 0.150                                          | 1808.                                         | 1395.                                     | 414.           | 4647.                         | 4.                             |
| 45.660          | 0.160                                          | 1903.                                         | 1495.                                     | 409.           | 5053.                         | 4.                             |
| 45.670          | 0.170                                          | 1999.                                         | 1597.                                     | 402.           | 5455.                         | 5.                             |
| 45.680          | 0.180                                          | 2094.                                         | 1701.                                     | 393.           | 5848.                         | 5.                             |
| 45.690          | 0.190                                          | 2190.                                         | 1807.                                     | 382.           | 6230.                         | 5.                             |
| 45.700          | 0.200                                          | 2285.                                         | 1914.                                     | 370.           | 6601.                         | 5.                             |
| 45.710          | 0.210                                          | 2380.                                         | 2023.                                     | 357.           | 6958.                         | 6.                             |
| 45.720          | 0.220                                          | 2475.                                         | 2133.                                     | 343.           | 7300.                         | 6.                             |
| 45.730          | 0.230                                          | 2570.                                         | 2243.                                     | 327.           | 7629.                         | 6.                             |
| 45.740          | 0.240                                          | 2666.                                         | 2355.                                     | 311.           | 7939.                         | 7.                             |
| 45.750          | 0.250                                          | 2751.                                         | 2467.                                     | 294.           | 8233.                         | 7.                             |
| 45.760          | 0.260                                          | 2836.                                         | 2579.                                     | 277.           | 8511.                         | 7.                             |
| 45.770          | 0.270                                          | 2911.                                         | 2692.                                     | 260.           | 8770.                         | 7.                             |
| 45.780          | 0.280                                          | 3047.                                         | 2805.                                     | 242.           | 9012.                         | 7.                             |
| 45.790          | 0.290                                          | 3142.                                         | 2918.                                     | 224.           | 9236.                         | 8.                             |
| 45.800          | 0.300                                          | 3237.                                         | 3031.                                     | 206.           | 9443.                         | 8.                             |
| 45.810          | 0.310                                          | 3333.                                         | 3144.                                     | 189.           | 9631.                         | 8.                             |
| 45.820          | 0.320                                          | 3426.                                         | 3257.                                     | 171.           | 9803.                         | 8.                             |
| 45.830          | 0.330                                          | 3523.                                         | 3369.                                     | 154.           | 9957.                         | 8.                             |
| 45.840          | 0.340                                          | 3619.                                         | 3481.                                     | 138.           | 10095.                        | 8.                             |
| 45.850          | 0.350                                          | 3714.                                         | 3592.                                     | 122.           | 10216.                        | 8.                             |
| 45.860          | 0.360                                          | 3809.                                         | 3703.                                     | 106.           | 10322.                        | 9.                             |
| 45.870          | 0.370                                          | 3904.                                         | 3813.                                     | 91.            | 10414.                        | 9.                             |
| 45.880          | 0.380                                          | 4000.                                         | 3922.                                     | 78.            | 10491.                        | 9.                             |
| 45.890          | 0.390                                          | 4095.                                         | 4030.                                     | 65.            | 10556.                        | 9.                             |
| 45.900          | 0.400                                          | 4190.                                         | 4138.                                     | 53.            | 10609.                        | 9.                             |
| 45.910          | 0.410                                          | 4286.                                         | 4244.                                     | 42.            | 10650.                        | 9.                             |
| 45.920          | 0.420                                          | 4381.                                         | 4349.                                     | 32.            | 10682.                        | 9.                             |
| 45.930          | 0.430                                          | 4476.                                         | 4453.                                     | 23.            | 10705.                        | 9.                             |
| 45.940          | 0.440                                          | 4571.                                         | 4556.                                     | 15.            | 10720.                        | 9.                             |
| 45.950          | 0.450                                          | 4667.                                         | 4658.                                     | 9.             | 10729.                        | 9.                             |
| 45.960          | 0.460                                          | 4762.                                         | 4758.                                     | 4.             | 10734.                        | 9.                             |
| 45.970          | 0.470                                          | 4857.                                         | 4856.                                     | 1.             | 10735.                        | 9.                             |

PLAN 1  
RATIO 2

PLAN 1  
RATIO 2

AD-A105 847

NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13  
NATIONAL DAM SAFETY PROGRAM. MECHANICVILLE RESERVOIR DAM (INVEN-ETC(U)  
AUG 81 G KOCH DACW51-79-C-0001

UNCLASSIFIED

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2 of 2  
Pages



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PEAK CUTFLOW IS 5985. AT TIME 42.50 HOURS -

|            | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|------------|------|--------|---------|---------|--------------|
| CFS        | 586. | 156.8  | 542.    | 195.    | 2833.        |
| CMS        | 170. | 44.    | 15.     | 6.      | 801.         |
| INCFES     |      | 6.66   | 9.22    | 9.36    | 10.04        |
| MM         |      | 169.15 | 234.06  | 253.07  | 254.92       |
| AC-FT      |      | 777.   | 1076.   | 1163.   | 1172.        |
| THOUS CU M |      | 959.   | 1327.   | 1435.   | 1445.        |

THE CAN BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.010 HOURS DURING BREACH FORMATION.  
 DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 0.500 HOURS.  
 THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.  
 INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

| TIME<br>(HOURS) | TIME FROM INTERPOLATED            |                               | COMPUTED                      |                               | ERROR          |                | ACCUMULATED    |                | ACCUMULATED<br>ERROR<br>(AC-FI) |
|-----------------|-----------------------------------|-------------------------------|-------------------------------|-------------------------------|----------------|----------------|----------------|----------------|---------------------------------|
|                 | BEGINNING<br>OF BREACH<br>(HCUES) | BREACH<br>HYDROGRAPH<br>(CFS) | BREACH<br>HYDROGRAPH<br>(CFS) | BREACH<br>HYDROGRAPH<br>(CFS) | ERROR<br>(CFS) | ERROR<br>(CFS) | ERROR<br>(CFS) | ERROR<br>(CFS) |                                 |
| 42-000          | 0.                                | 1004.                         | 1004.                         | 1004.                         | 0.             | 0.             | 0.             | 0.             | 0.                              |
| 42-010          | 0.010                             | 1104.                         | 1078.                         | 1078.                         | 26.            | 26.            | 26.            | 26.            | 0.                              |
| 42-020          | 0.020                             | 1204.                         | 1145.                         | 1145.                         | 59.            | 84.            | 84.            | 84.            | 0.                              |
| 42-030          | 0.030                             | 1303.                         | 1216.                         | 1216.                         | 87.            | 172.           | 172.           | 172.           | 0.                              |
| 42-040          | 0.040                             | 1403.                         | 1290.                         | 1290.                         | 113.           | 285.           | 285.           | 285.           | 0.                              |
| 42-050          | 0.050                             | 1503.                         | 1365.                         | 1365.                         | 137.           | 422.           | 422.           | 422.           | 0.                              |
| 42-060          | 0.060                             | 1602.                         | 1442.                         | 1442.                         | 160.           | 582.           | 582.           | 582.           | 0.                              |
| 42-070          | 0.070                             | 1702.                         | 1520.                         | 1520.                         | 181.           | 764.           | 764.           | 764.           | 1.                              |
| 42-080          | 0.080                             | 1802.                         | 1599.                         | 1599.                         | 202.           | 966.           | 966.           | 966.           | 1.                              |
| 42-090          | 0.090                             | 1901.                         | 1678.                         | 1678.                         | 223.           | 1189.          | 1189.          | 1189.          | 1.                              |
| 42-100          | 0.100                             | 2001.                         | 1757.                         | 1757.                         | 244.           | 1433.          | 1433.          | 1433.          | 1.                              |
| 42-110          | 0.110                             | 2100.                         | 1836.                         | 1836.                         | 264.           | 1697.          | 1697.          | 1697.          | 1.                              |
| 42-120          | 0.120                             | 2200.                         | 1915.                         | 1915.                         | 285.           | 1982.          | 1982.          | 1982.          | 2.                              |
| 42-130          | 0.130                             | 2300.                         | 1994.                         | 1994.                         | 306.           | 2288.          | 2288.          | 2288.          | 2.                              |
| 42-140          | 0.140                             | 2399.                         | 2073.                         | 2073.                         | 327.           | 2614.          | 2614.          | 2614.          | 2.                              |
| 42-150          | 0.150                             | 2499.                         | 2151.                         | 2151.                         | 348.           | 2962.          | 2962.          | 2962.          | 2.                              |
| 42-160          | 0.160                             | 2599.                         | 2230.                         | 2230.                         | 369.           | 3331.          | 3331.          | 3331.          | 3.                              |
| 42-170          | 0.170                             | 2698.                         | 2308.                         | 2308.                         | 390.           | 3721.          | 3721.          | 3721.          | 3.                              |
| 42-180          | 0.180                             | 2798.                         | 2387.                         | 2387.                         | 411.           | 4132.          | 4132.          | 4132.          | 3.                              |
| 42-190          | 0.190                             | 2897.                         | 2466.                         | 2466.                         | 431.           | 4564.          | 4564.          | 4564.          | 4.                              |
| 42-200          | 0.200                             | 2977.                         | 2546.                         | 2546.                         | 451.           | 5015.          | 5015.          | 5015.          | 4.                              |
| 42-210          | 0.210                             | 3077.                         | 2626.                         | 2626.                         | 470.           | 5485.          | 5485.          | 5485.          | 5.                              |
| 42-220          | 0.220                             | 3196.                         | 2708.                         | 2708.                         | 488.           | 5974.          | 5974.          | 5974.          | 5.                              |
| 42-230          | 0.230                             | 3296.                         | 2792.                         | 2792.                         | 504.           | 6478.          | 6478.          | 6478.          | 5.                              |
| 42-240          | 0.240                             | 3396.                         | 2878.                         | 2878.                         | 518.           | 6995.          | 6995.          | 6995.          | 6.                              |
| 42-250          | 0.250                             | 3495.                         | 2967.                         | 2967.                         | 528.           | 7523.          | 7523.          | 7523.          | 6.                              |
| 42-260          | 0.260                             | 3595.                         | 3060.                         | 3060.                         | 534.           | 8058.          | 8058.          | 8058.          | 7.                              |
| 42-270          | 0.270                             | 3694.                         | 3160.                         | 3160.                         | 534.           | 8592.          | 8592.          | 8592.          | 7.                              |
| 42-280          | 0.280                             | 3794.                         | 3269.                         | 3269.                         | 525.           | 9117.          | 9117.          | 9117.          | 8.                              |
| 42-290          | 0.290                             | 3894.                         | 3399.                         | 3399.                         | 495.           | 9612.          | 9612.          | 9612.          | 8.                              |
| 42-300          | 0.300                             | 3993.                         | 3531.                         | 3531.                         | 462.           | 10074.         | 10074.         | 10074.         | 8.                              |
| 42-310          | 0.310                             | 4093.                         | 3663.                         | 3663.                         | 429.           | 10503.         | 10503.         | 10503.         | 9.                              |
| 42-320          | 0.320                             | 4193.                         | 3795.                         | 3795.                         | 397.           | 10900.         | 10900.         | 10900.         | 9.                              |
| 42-330          | 0.330                             | 4292.                         | 3927.                         | 3927.                         | 365.           | 11266.         | 11266.         | 11266.         | 9.                              |
| 42-340          | 0.340                             | 4392.                         | 4057.                         | 4057.                         | 335.           | 11601.         | 11601.         | 11601.         | 10.                             |
| 42-350          | 0.350                             | 4491.                         | 4187.                         | 4187.                         | 304.           | 11905.         | 11905.         | 11905.         | 10.                             |
| 42-360          | 0.360                             | 4591.                         | 4316.                         | 4316.                         | 275.           | 12180.         | 12180.         | 12180.         | 10.                             |
| 42-370          | 0.370                             | 4691.                         | 4444.                         | 4444.                         | 247.           | 12427.         | 12427.         | 12427.         | 10.                             |
| 42-380          | 0.380                             | 4790.                         | 4571.                         | 4571.                         | 220.           | 12647.         | 12647.         | 12647.         | 10.                             |
| 42-390          | 0.390                             | 4890.                         | 4696.                         | 4696.                         | 194.           | 12840.         | 12840.         | 12840.         | 11.                             |
| 42-400          | 0.400                             | 4990.                         | 4821.                         | 4821.                         | 167.           | 13009.         | 13009.         | 13009.         | 11.                             |
| 42-410          | 0.410                             | 5089.                         | 4944.                         | 4944.                         | 145.           | 13154.         | 13154.         | 13154.         | 11.                             |
| 42-420          | 0.420                             | 5189.                         | 5066.                         | 5066.                         | 123.           | 13277.         | 13277.         | 13277.         | 11.                             |
| 42-430          | 0.430                             | 5288.                         | 5186.                         | 5186.                         | 102.           | 13379.         | 13379.         | 13379.         | 11.                             |
| 42-440          | 0.440                             | 5388.                         | 5305.                         | 5305.                         | 83.            | 13452.         | 13452.         | 13452.         | 11.                             |
| 42-450          | 0.450                             | 5488.                         | 5423.                         | 5423.                         | 65.            | 13526.         | 13526.         | 13526.         | 11.                             |
| 42-460          | 0.460                             | 5587.                         | 5539.                         | 5539.                         | 48.            | 13575.         | 13575.         | 13575.         | 11.                             |
| 42-470          | 0.470                             | 5687.                         | 5653.                         | 5653.                         | 34.            | 13609.         | 13609.         | 13609.         | 11.                             |
| 42-480          | 0.480                             | 5787.                         | 5766.                         | 5766.                         | 21.            | 13629.         | 13629.         | 13629.         | 11.                             |
| 42-490          | 0.490                             | 5886.                         | 5877.                         | 5877.                         | 10.            | 13639.         | 13639.         | 13639.         | 11.                             |
| 42-500          | 0.500                             | 5986.                         | 5986.                         | 5986.                         | 0.             | 13639.         | 13639.         | 13639.         | 11.                             |

PLAN 1  
 RATIO 7



•OVN.

STATION DAM, PLAN 1, NATIO H

BEGIN DAM FAILURE AT 10.30 HOURS

END-OF-PERIOD HYDROGRAPH ORDINATES

|       | 1.    | 2.    | 3.    | 4.    | 5.    | 6.    | 7.    | 8.    |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.    | 7.    | 7.    | 8.    | 8.    | 7.    | 6.    | 7.    | 7.    |
| 7.    | 7.    | 7.    | 6.    | 6.    | 6.    | 5.    | 5.    | 5.    |
| 5.    | 5.    | 5.    | 5.    | 5.    | 5.    | 11.   | 14.   | 19.   |
| 20.   | 20.   | 20.   | 20.   | 19.   | 17.   | 15.   | 13.   | 12.   |
| 11.   | 10.   | 10.   | 9.    | 9.    | 7.    | 6.    | 6.    | 5.    |
| 5.    | 5.    | 5.    | 5.    | 6.    | 8.    | 12.   | 19.   | 37.   |
| 57.   | 70.   | 83.   | 99.   | 127.  | 179.  | 269.  | 320.  | 334.  |
| 631.  | 6214. | 2526. | 2588. | 2745. | 3127. | 3171. | 2832. | 2544. |
| 2254. | 1966. | 1698. | 1463. | 1260. | 1086. | 936.  | 837.  | 600.  |
| 510.  | 447.  | 386.  | 340.  | 313.  | 298.  | 285.  | 274.  | 253.  |
| 243.  | 233.  | 224.  | 215.  | 207.  | 199.  | 191.  | 176.  | 169.  |
| 163.  | 156.  | 150.  | 144.  | 139.  | 133.  | 128.  | 118.  | 114.  |
| 109.  | 105.  | 101.  | 97.   | 93.   | 90.   | 86.   | 83.   | 79.   |
| 73.   | 71.   | 68.   | 65.   | 63.   | 60.   | 58.   | 56.   | 51.   |
| 49.   | 47.   | 46.   | 44.   | 42.   | 40.   | 39.   | 37.   | 35.   |
| 33.   | 32.   | 31.   | 30.   | 29.   | 27.   | 26.   | 25.   | 23.   |
| 22.   | 22.   | 21.   | 20.   | 19.   | 18.   | 18.   | 17.   | 16.   |
| 15.   | 15.   | 14.   | 13.   | 13.   | 12.   | 12.   | 11.   | 11.   |
| 10.   | 10.   | 9.    | 9.    | 9.    | 8.    | 8.    | 8.    | 7.    |

STORAGE

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|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----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STAGE

|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 263.0 | 263.1 | 263.2 | 263.3 | 263.4 | 263.5 | 263.6 | 263.7 | 263.8 | 263.9 | 264.0 | 264.1 | 264.2 | 264.3 | 264.4 | 264.5 | 264.6 | 264.7 | 264.8 | 264.9 | 265.0 | 265.1 | 265.2 | 265.3 | 265.4 | 265.5 | 265.6 | 265.7 | 265.8 | 265.9 | 266.0 | 266.1 | 266.2 | 266.3 | 266.4 | 266.5 | 266.6 | 266.7 | 266.8 | 266.9 | 267.0 | 267.1 | 267.2 | 267.3 | 267.4 | 267.5 | 267.6 | 267.7 | 267.8 | 267.9 | 268.0 | 268.1 | 268.2 | 268.3 | 268.4 | 268.5 | 268.6 | 268.7 | 268.8 | 268.9 | 269.0 | 269.1 | 269.2 | 269.3 | 269.4 | 269.5 | 269.6 | 269.7 | 269.8 | 269.9 | 270.0 | 270.1 | 270.2 | 270.3 | 270.4 | 270.5 | 270.6 | 270.7 | 270.8 | 270.9 | 271.0 | 271.1 | 271.2 | 271.3 | 271.4 | 271.5 | 271.6 | 271.7 | 271.8 | 271.9 | 272.0 | 272.1 | 272.2 | 272.3 | 272.4 | 272.5 | 272.6 | 272.7 | 272.8 | 272.9 | 273.0 | 273.1 | 273.2 | 273.3 | 273.4 | 273.5 | 273.6 | 273.7 | 273.8 | 273.9 | 274.0 | 274.1 | 274.2 | 274.3 | 274.4 | 274.5 | 274.6 | 274.7 | 274.8 | 274.9 | 275.0 | 275.1 | 275.2 | 275.3 | 275.4 | 275.5 | 275.6 | 275.7 | 275.8 | 275.9 | 276.0 | 276.1 | 276.2 | 276.3 | 276.4 | 276.5 | 276.6 | 276.7 | 276.8 | 276.9 | 277.0 | 277.1 | 277.2 | 277.3 | 277.4 | 277.5 | 277.6 | 277.7 | 277.8 | 277.9 | 278.0 | 278.1 | 278.2 | 278.3 | 278.4 | 278.5 | 278.6 | 278.7 | 278.8 | 278.9 | 279.0 | 279.1 | 279.2 | 279.3 | 279.4 | 279.5 | 279.6 | 279.7 | 279.8 | 279.9 | 280.0 | 280.1 | 280.2 | 280.3 | 280.4 | 280.5 | 280.6 | 280.7 | 280.8 | 280.9 | 281.0 | 281.1 | 281.2 | 281.3 | 281.4 | 281.5 | 281.6 | 281.7 | 281.8 | 281.9 | 282.0 | 282.1 | 282.2 | 282.3 | 282.4 | 282.5 | 282.6 | 282.7 | 282.8 | 282.9 | 283.0 | 283.1 | 283.2 | 283.3 | 283.4 | 283.5 | 283.6 | 283.7 | 283.8 | 283.9 | 284.0 | 284.1 | 284.2 | 284.3 | 284.4 | 284.5 | 284.6 | 284.7 | 284.8 | 284.9 | 285.0 | 285.1 | 285.2 | 285.3 | 285.4 | 285.5 | 285.6 | 285.7 | 285.8 | 285.9 | 286.0 | 286.1 | 286.2 | 286.3 | 286.4 | 286.5 | 286.6 | 286.7 | 286.8 | 286.9 | 287.0 | 287.1 | 287.2 | 287.3 | 287.4 | 287.5 | 287.6 | 287.7 | 287.8 | 287.9 | 288.0 | 288.1 | 288.2 | 288.3 | 288.4 | 288.5 | 288.6 | 288.7 | 288.8 | 288.9 | 289.0 | 289.1 | 289.2 | 289.3 | 289.4 | 289.5 | 289.6 | 289.7 | 289.8 | 289.9 | 290.0 | 290.1 | 290.2 | 290.3 | 290.4 | 290.5 | 290.6 | 290.7 | 290.8 | 290.9 | 291.0 | 291.1 | 291.2 | 291.3 | 291.4 | 291.5 | 291.6 | 291.7 | 291.8 | 291.9 | 292.0 | 292.1 | 292.2 | 292.3 | 292.4 | 292.5 | 292.6 | 292.7 | 292.8 | 292.9 | 293.0 | 293.1 | 293.2 | 293.3 | 293.4 | 293.5 | 293.6 | 293.7 | 293.8 | 293.9 | 294.0 | 294.1 | 294.2 | 294.3 | 294.4 | 294.5 | 294.6 | 294.7 | 294.8 | 294.9 | 295.0 | 295.1 | 295.2 | 295.3 | 295.4 | 295.5 | 295.6 | 295.7 | 295.8 | 295.9 | 296.0 | 296.1 | 296.2 | 296.3 | 296.4 | 296.5 | 296.6 | 296.7 | 296.8 | 296.9 | 297.0 | 297.1 | 297.2 | 297.3 | 297.4 | 297.5 | 297.6 | 297.7 | 297.8 | 297.9 | 298.0 | 298.1 | 298.2 | 298.3 | 298.4 | 298.5 | 298.6 | 298.7 | 298.8 | 298.9 | 299.0 | 299.1 | 299.2 | 299.3 | 299.4 | 299.5 | 299.6 | 299.7 | 299.8 | 299.9 | 300.0 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

PLAN 1  
RATIO 8

|      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|
| 124. | 124. | 124. | 124. | 124. | 124. | 124. | 124. | 124. | 124. |
| 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. | 123. |
| 122. | 122. | 122. | 122. | 122. | 122. | 122. | 122. | 122. | 122. |
| 121. | 121. | 121. | 121. | 121. | 121. | 121. | 121. | 121. | 121. |
| 121. | 121. | 121. | 121. | 121. | 121. | 121. | 121. | 121. | 120. |

| STAGE |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 263.0 | 263.0 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 |
| 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 | 263.2 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 | 263.1 |
| 263.5 | 263.6 | 263.6 | 263.7 | 263.9 | 264.1 | 264.4 | 265.0 | 265.8 | 267.2 |

|       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 268.9 | 266.2 | 260.5 | 260.6 | 261.3 | 261.7 | 261.7 | 261.5 | 261.1 | 260.5 |
| 259.9 | 259.2 | 258.6 | 256.0 | 257.5 | 257.0 | 256.5 | 256.1 | 255.7 | 255.4 |
| 255.1 | 254.8 | 254.5 | 254.3 | 254.2 | 254.1 | 254.1 | 254.0 | 254.0 | 253.9 |
| 253.9 | 253.8 | 253.8 | 253.7 | 253.7 | 253.6 | 253.6 | 253.6 | 253.5 | 253.5 |
| 253.4 | 253.4 | 253.4 | 253.3 | 253.3 | 253.3 | 253.2 | 253.2 | 253.2 | 253.1 |
| 253.1 | 253.1 | 253.1 | 253.0 | 253.0 | 253.0 | 252.9 | 252.9 | 252.9 | 252.9 |
| 252.9 | 252.8 | 252.8 | 252.8 | 252.8 | 252.7 | 252.7 | 252.7 | 252.7 | 252.7 |
| 252.7 | 252.6 | 252.6 | 252.6 | 252.6 | 252.6 | 252.6 | 252.5 | 252.5 | 252.5 |
| 252.5 | 252.5 | 252.5 | 252.5 | 252.5 | 252.4 | 252.4 | 252.4 | 252.4 | 252.4 |
| 252.4 | 252.4 | 252.4 | 252.4 | 252.3 | 252.3 | 252.3 | 252.3 | 252.3 | 252.3 |
| 252.3 | 252.3 | 252.3 | 252.3 | 252.3 | 252.3 | 252.3 | 252.2 | 252.2 | 252.2 |
| 252.2 | 252.2 | 252.2 | 252.2 | 252.2 | 252.2 | 252.2 | 252.2 | 252.2 | 252.2 |

PEAK OUTFLOW IS 6214. AT TIME 41.00 HOURS

| PEAK  |        |        |        | TOTAL VOLUME |  |  |  |
|-------|--------|--------|--------|--------------|--|--|--|
| 6214. | 2865.  | 1035.  | 375.   | 5434.        |  |  |  |
| 176.  | 81.    | 29.    | 11.    | 1540.        |  |  |  |
|       | 12.18  | 17.50  | 19.10  | 19.25        |  |  |  |
|       | 309.26 | 446.98 | 485.20 | 488.96       |  |  |  |
|       | 1421.  | 2054.  | 2230.  | 2247.        |  |  |  |
|       | 1753.  | 2514.  | 2751.  | 2772.        |  |  |  |

CFS  
CMS  
INCHES  
MN  
AC-FT  
THOUS CU M

THE LEAK BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.010 HOURS DURING BREACH FORMATION. DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 0.000 HOURS. THIS TABLE COMPARES THE HYDROGRAPH FOR INSTANTANEOUS CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH. INTERPOLATED FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

PLAN 1  
RATIO 8

| TIME<br>(HOURS) | TIME FROM<br>BEGINNING<br>OF BREACH<br>(HOURS) | INTERPOLATED<br>BREACH<br>HYDROGRAPH<br>(CFS) | COMPUTED<br>BREACH<br>HYDROGRAPH<br>(CFS) | ERROR<br>(CFS) | ACCUMULATED<br>ERROR<br>(CFS) | ACCUMULATED<br>ERROR<br>(AC-F) |
|-----------------|------------------------------------------------|-----------------------------------------------|-------------------------------------------|----------------|-------------------------------|--------------------------------|
| 40.500          | 0.                                             | 631.                                          | 631.                                      | 0.             | 0.                            | 0.                             |
| 40.510          | 0.010                                          | 743.                                          | 713.                                      | 29.            | 29.                           | 0.                             |
| 40.520          | 0.020                                          | 854.                                          | 796.                                      | 58.            | 88.                           | 0.                             |
| 40.530          | 0.030                                          | 966.                                          | 866.                                      | 81.            | 169.                          | 0.                             |
| 40.540          | 0.040                                          | 1078.                                         | 980.                                      | 98.            | 266.                          | 0.                             |
| 40.550          | 0.050                                          | 1189.                                         | 1077.                                     | 112.           | 378.                          | 0.                             |
| 40.560          | 0.060                                          | 1301.                                         | 1177.                                     | 124.           | 502.                          | 0.                             |
| 40.570          | 0.070                                          | 1413.                                         | 1279.                                     | 134.           | 636.                          | 1.                             |
| 40.580          | 0.080                                          | 1524.                                         | 1382.                                     | 143.           | 778.                          | 1.                             |
| 40.590          | 0.090                                          | 1636.                                         | 1485.                                     | 151.           | 929.                          | 1.                             |
| 40.600          | 0.100                                          | 1748.                                         | 1588.                                     | 160.           | 1089.                         | 1.                             |
| 40.610          | 0.110                                          | 1859.                                         | 1690.                                     | 169.           | 1258.                         | 1.                             |
| 40.620          | 0.120                                          | 1971.                                         | 1792.                                     | 179.           | 1437.                         | 1.                             |
| 40.630          | 0.130                                          | 2083.                                         | 1893.                                     | 189.           | 1626.                         | 1.                             |
| 40.640          | 0.140                                          | 2194.                                         | 1994.                                     | 201.           | 1827.                         | 2.                             |
| 40.650          | 0.150                                          | 2306.                                         | 2093.                                     | 213.           | 2040.                         | 2.                             |
| 40.660          | 0.160                                          | 2418.                                         | 2191.                                     | 226.           | 2266.                         | 2.                             |
| 40.670          | 0.170                                          | 2529.                                         | 2289.                                     | 241.           | 2507.                         | 2.                             |
| 40.680          | 0.180                                          | 2641.                                         | 2385.                                     | 256.           | 2762.                         | 2.                             |
| 40.690          | 0.190                                          | 2753.                                         | 2481.                                     | 272.           | 3034.                         | 3.                             |
| 40.700          | 0.200                                          | 2864.                                         | 2576.                                     | 288.           | 3322.                         | 3.                             |
| 40.710          | 0.210                                          | 2976.                                         | 2671.                                     | 305.           | 3626.                         | 3.                             |
| 40.720          | 0.220                                          | 3088.                                         | 2766.                                     | 321.           | 3948.                         | 3.                             |
| 40.730          | 0.230                                          | 3199.                                         | 2861.                                     | 338.           | 4286.                         | 4.                             |
| 40.740          | 0.240                                          | 3311.                                         | 2957.                                     | 354.           | 4639.                         | 4.                             |
| 40.750          | 0.250                                          | 3422.                                         | 3054.                                     | 368.           | 5007.                         | 4.                             |
| 40.760          | 0.260                                          | 3534.                                         | 3153.                                     | 381.           | 5388.                         | 4.                             |
| 40.770          | 0.270                                          | 3646.                                         | 3255.                                     | 391.           | 5779.                         | 5.                             |
| 40.780          | 0.280                                          | 3757.                                         | 3361.                                     | 397.           | 6176.                         | 5.                             |
| 40.790          | 0.290                                          | 3869.                                         | 3472.                                     | 397.           | 6573.                         | 5.                             |
| 40.800          | 0.300                                          | 3981.                                         | 3586.                                     | 395.           | 6957.                         | 6.                             |
| 40.810          | 0.310                                          | 4092.                                         | 3706.                                     | 386.           | 7314.                         | 6.                             |
| 40.820          | 0.320                                          | 4204.                                         | 3829.                                     | 375.           | 7642.                         | 6.                             |
| 40.830          | 0.330                                          | 4316.                                         | 3954.                                     | 362.           | 7944.                         | 7.                             |
| 40.840          | 0.340                                          | 4427.                                         | 4081.                                     | 346.           | 8219.                         | 7.                             |
| 40.850          | 0.350                                          | 4539.                                         | 4210.                                     | 329.           | 8467.                         | 7.                             |
| 40.860          | 0.360                                          | 4651.                                         | 4341.                                     | 310.           | 8691.                         | 7.                             |
| 40.870          | 0.370                                          | 4763.                                         | 4473.                                     | 290.           | 8890.                         | 7.                             |
| 40.880          | 0.380                                          | 4874.                                         | 4608.                                     | 264.           | 9066.                         | 7.                             |
| 40.890          | 0.390                                          | 4986.                                         | 4746.                                     | 240.           | 9219.                         | 8.                             |
| 40.900          | 0.400                                          | 5097.                                         | 4887.                                     | 210.           | 9352.                         | 8.                             |
| 40.910          | 0.410                                          | 5209.                                         | 5030.                                     | 179.           | 9464.                         | 8.                             |
| 40.920          | 0.420                                          | 5321.                                         | 5175.                                     | 146.           | 9558.                         | 8.                             |
| 40.930          | 0.430                                          | 5432.                                         | 5322.                                     | 110.           | 9635.                         | 8.                             |
| 40.940          | 0.440                                          | 5544.                                         | 5470.                                     | 74.            | 9696.                         | 8.                             |
| 40.950          | 0.450                                          | 5656.                                         | 5619.                                     | 37.            | 9743.                         | 8.                             |
| 40.960          | 0.460                                          | 5767.                                         | 5767.                                     | 0.             | 9777.                         | 8.                             |
| 40.970          | 0.470                                          | 5879.                                         | 5916.                                     | -23.           | 9801.                         | 8.                             |
| 40.980          | 0.480                                          | 5990.                                         | 6065.                                     | -55.           | 9814.                         | 8.                             |
| 40.990          | 0.490                                          | 6102.                                         | 6214.                                     | -86.           | 9820.                         | 8.                             |
| 41.000          | 0.500                                          | 6214.                                         | 6214.                                     | 0.             | 9820.                         | 8.                             |





REACH 2 210 TO 130 LOCAL ROAD

## NORMAL DEPTH CHANNEL ROUTING

CROSS SECTION COORDINATES--STA,ELTV,STA,ELEV--ETC.

| CROSS SECTION COORDINATES--SIA, ELEV, SIA, ELEV--ETC. |        |        |        |        |
|-------------------------------------------------------|--------|--------|--------|--------|
| 00.00                                                 | 144.00 | 200.00 | 134.00 | 150.00 |
|                                                       |        |        | 150.00 | 130.00 |
|                                                       |        |        | 150.00 | 165.00 |
|                                                       |        |        | 150.00 | 170.00 |

STATION 80K. PLAIN 1. RYID 1

| OUTFLOW |      |      |      |      |      |      |      |      |      |
|---------|------|------|------|------|------|------|------|------|------|
| 0.      | 0.   | 0.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.      | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.      | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 1.      | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   | 1.   |
| 3.      | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   |
| 3.      | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   | 3.   |
| 2.      | 1.   | 1.   | 1.   | 1.   | 2.   | 2.   | 2.   | 2.   | 2.   |
| 5.      | 7.   | 5.   | 13.  | 13.  | 18.  | 27.  | 40.  | 66.  | 103. |
| 145.    | 197. | 256. | 310. | 323. | 324. | 328. | 331. | 335. | 338. |
| 340.    | 341. | 342. | 341. | 341. | 340. | 338. | 336. | 334. | 331. |
| 329.    | 326. | 322. | 219. | 203. | 212. | 153. | 115. | 93.  | 81.  |
| 70.     | 63.  | 57.  | 54.  | 51.  | 49.  | 46.  | 45.  | 43.  | 41.  |
| 39.     | 36.  | 33.  | 31.  | 32.  | 31.  | 29.  | 29.  | 28.  | 27.  |
| 26.     | 25.  | 24.  | 23.  | 22.  | 21.  | 20.  | 19.  | 19.  | 18.  |

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

| OPERATION     | STATION | AREA               | PLAN | RATIOS APPLIED TO FLOWS |           |           |           |           |           |           |           |  |  |
|---------------|---------|--------------------|------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|--|
|               |         |                    |      | RATIO 1                 | RATIO 2   | RATIO 3   | RATIO 4   | RATIO 5   | RATIO 6   | RATIO 7   | RATIO 8   |  |  |
| HYDROGRAPH AT | HASIN   | 2.19<br>( 2682.47) | 1    | 0.20                    | 0.21      | 0.22      | 0.23      | 0.24      | 0.25      | 0.50      | 1.00      |  |  |
|               |         |                    |      | ( 17.54)                | ( 18.84)  | ( 19.73)  | ( 20.63)  | ( 21.53)  | ( 22.42)  | ( 44.83)  | ( 89.69)  |  |  |
| ROUTED TO     | DAM     | 2.19<br>( 2682.47) | 1    | 342.                    | 5143.     | 5231.     | 5296.     | 5352.     | 5397.     | 5985.     | 6214.     |  |  |
|               |         |                    |      | ( 9.67)                 | ( 125.64) | ( 148.13) | ( 149.56) | ( 151.54) | ( 152.84) | ( 165.50) | ( 175.95) |  |  |
| ROUTED TO     | 32K     | 2.19<br>( 2682.47) | 1    | 342.                    | 3499.     | 3618.     | 3655.     | 3834.     | 3766.     | 4571.     | 4474.     |  |  |
|               |         |                    |      | ( 9.67)                 | ( 99.08)  | ( 102.44) | ( 103.51) | ( 108.58) | ( 106.65) | ( 125.45) | ( 126.69) |  |  |
| ROUTED TO     | 80K     | 2.19<br>( 2682.47) | 1    | 342.                    | 3258.     | 3356.     | 3442.     | 3482.     | 3573.     | 4418.     | 5049.     |  |  |
|               |         |                    |      | ( 9.67)                 | ( 92.25)  | ( 95.04)  | ( 97.47)  | ( 98.59)  | ( 101.17) | ( 125.10) | ( 142.98) |  |  |

# SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

ELEVATION STORAGE CUTFLOW INITIAL VALUE SPILLWAY CRIST TCP OF DAM  
263.00 201. 263.00 268.50  
0. 0. 201. 322.  
0. 343.

| RATIO OF PMF | MAXIMUM RESERVOIR W.S.ELEV | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM CUTFLOW CFS | DURATION OVER TOF HOURS | TIME OF MAX CUTFLOW HOURS | TYPE OF FAILURE HOURS |
|--------------|----------------------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| 0.20         | 268.27                     | 0.                     | 317.                  | 342.                | 0.                      | 46.50                     | C.                    |
| 0.21         | 268.61                     | 0.11                   | 324.                  | 5143.               | 0.61                    | 46.00                     | 45.50                 |
| 0.22         | 268.72                     | 0.22                   | 327.                  | 5231.               | 0.65                    | 45.50                     | 45.00                 |
| 0.23         | 268.72                     | 0.22                   | 327.                  | 5236.               | 0.66                    | 45.00                     | 44.50                 |
| 0.24         | 268.91                     | 0.41                   | 331.                  | 5352.               | 1.19                    | 45.00                     | 44.50                 |
| 0.25         | 269.75                     | 0.29                   | 328.                  | 5397.               | 0.58                    | 44.50                     | 44.00                 |
| 0.50         | 269.26                     | 0.76                   | 339.                  | 5986.               | 0.78                    | 42.50                     | 42.00                 |
| 1.00         | 265.12                     | 0.62                   | 336.                  | 6214.               | 0.79                    | 41.00                     | 40.50                 |

PLAN 3 STATION 32K

| RATIO | MAXIMUM FLOW CFS | MAXIMUM STAGE FT | TIME HOURS |
|-------|------------------|------------------|------------|
| 0.20  | 342.             | 212.7            | 46.50      |
| 0.21  | 3499.            | 214.9            | 46.00      |
| 0.22  | 3618.            | 214.9            | 45.50      |
| 0.23  | 3655.            | 215.0            | 45.00      |
| 0.24  | 3834.            | 215.0            | 45.00      |
| 0.25  | 3766.            | 215.0            | 44.50      |
| 0.50  | 4571.            | 215.4            | 42.50      |
| 1.00  | 4474.            | 215.3            | 41.00      |

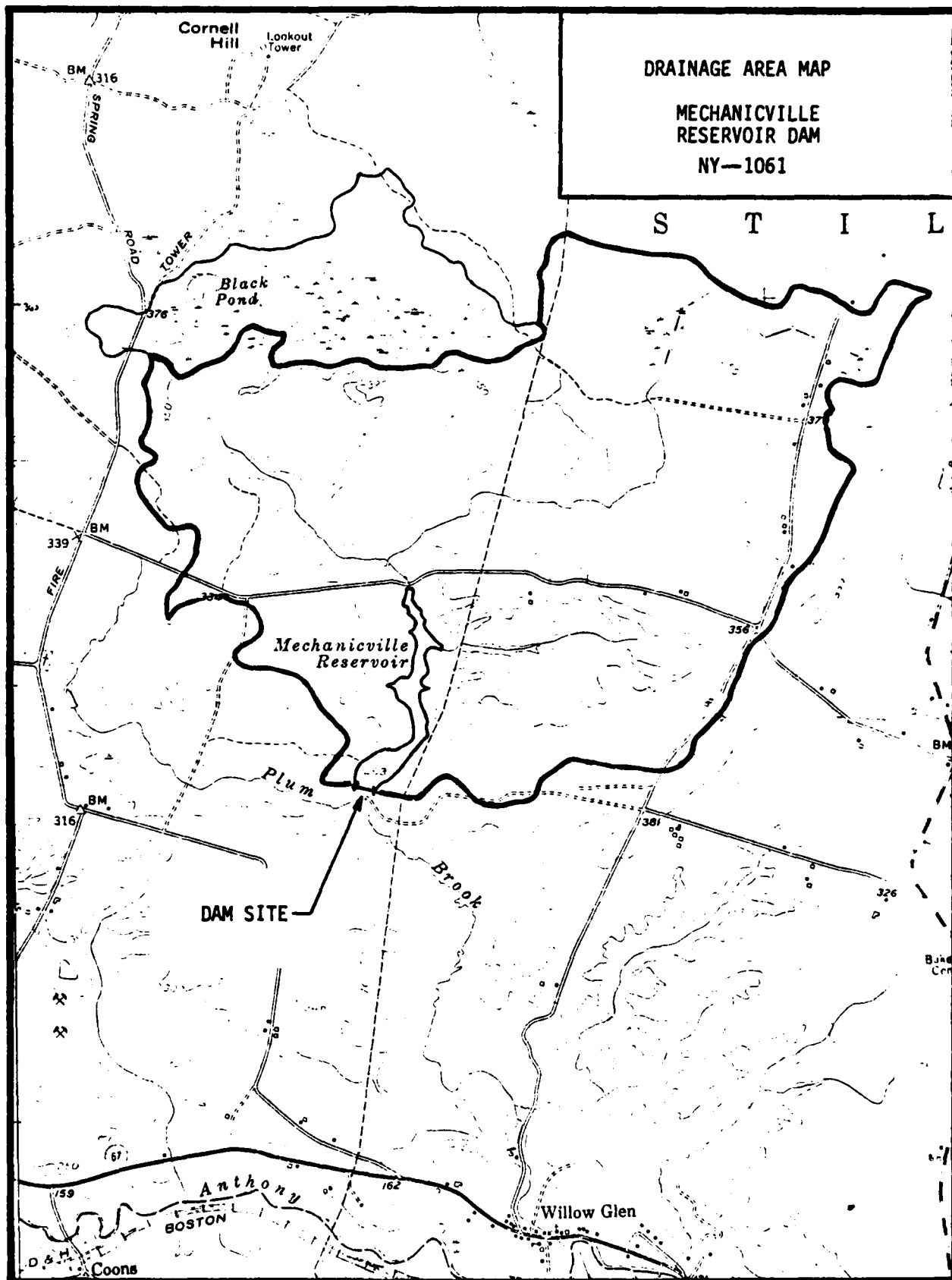
PLAN 1 STATION 80K

| RATIO | MAXIMUM FLOW CFS | MAXIMUM STAGE FT | TIME HOURS |
|-------|------------------|------------------|------------|
| 0.20  | 342.             | 132.9            | 46.50      |
| 0.21  | 3258.            | 135.9            | 46.50      |
| 0.22  | 3346.            | 136.0            | 46.00      |
| 0.23  | 3442.            | 136.0            | 45.50      |
| 0.24  | 3482.            | 136.1            | 45.50      |
| 0.25  | 3573.            | 136.1            | 45.00      |
| 0.50  | 4418.            | 136.5            | 43.00      |
| 1.00  | 5049.            | 136.9            | 41.50      |

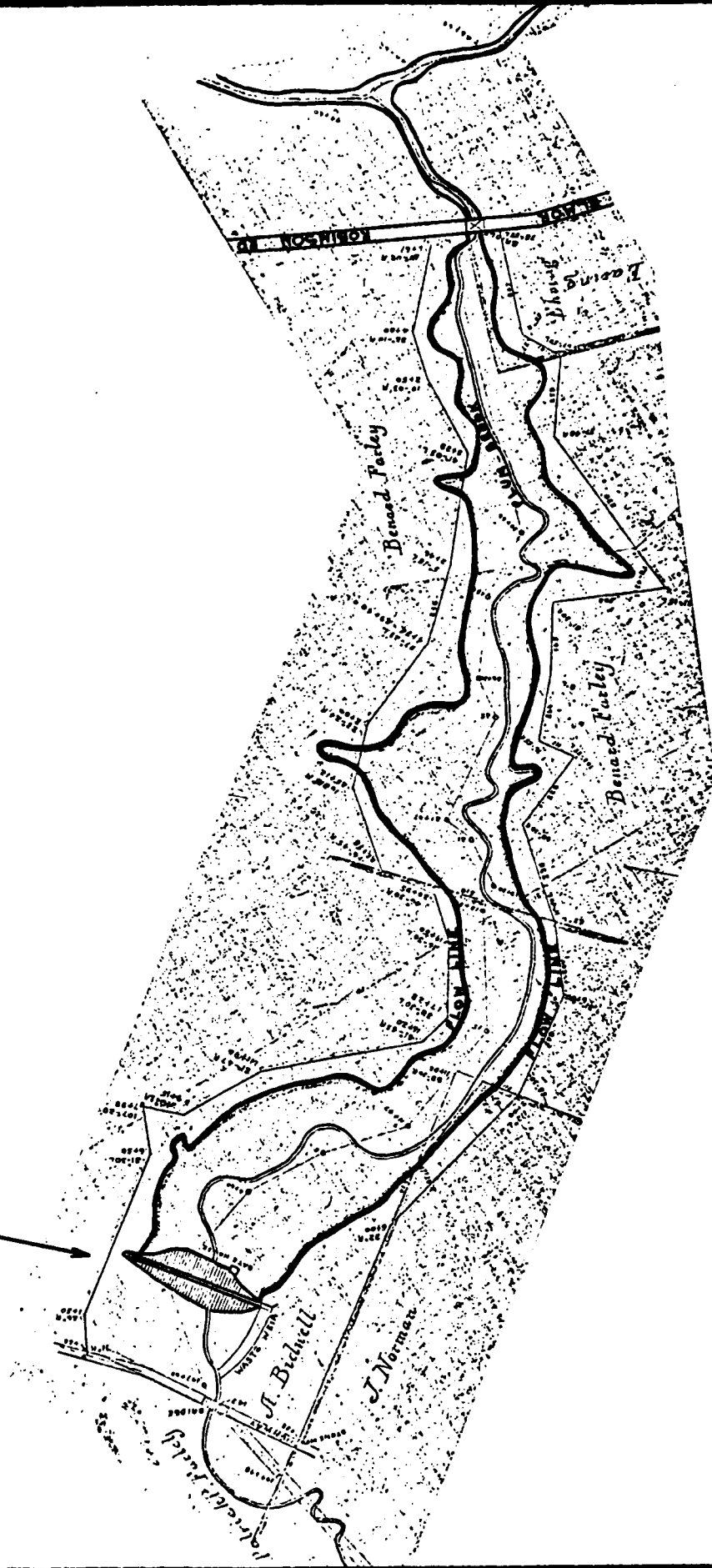
MECHANICVILLE RESERVOIR DAM

NY - 1061

WITH BREACH



DAM SITE



Discharge measurements made at low-flow partial-record stations during water year 1961--Continued

Discharge measurements made at 100-plus partial-record stations during water year 1961.

| Station No.                     | Station name                                             | Location                                                                                                                                                                                                                            | Drainage area (sq mi) | Period of record       | Measurements                             |                              |
|---------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|------------------------------------------|------------------------------|
|                                 |                                                          |                                                                                                                                                                                                                                     |                       |                        | Date                                     | Discharge (cfs)              |
| Hudson River basin -- Continued |                                                          |                                                                                                                                                                                                                                     |                       |                        |                                          |                              |
| 3287                            | Moses Kill near Fort Miller, N. Y.                       | Lat 43°12'12", long 73°33'06", at bridge on county highway, 3.2 miles northeast of Fort Miller.                                                                                                                                     | 37.9                  | 1956-61                | 8- 2-61                                  | 3.72                         |
| 3293                            | White Creek near Salem, N. Y.                            | Lat 43°09'07", long 73°21'18", at bridge on town road, 2.1 miles southwest of Salem.                                                                                                                                                | 48.6                  | 1956-61                | 8- 9-61                                  | 8.11                         |
| 3348                            | Owl Kill at Eagle Bridge, N. Y.                          | Lat 42°57'08", long 73°22'57", at bridge upstream from bridge on State Highway 67, at Eagle Bridge.                                                                                                                                 | 56.4                  | 1911, 1956-61          | 7- 7-61<br>8-14-61                       | 14.8<br>8.28                 |
| 3357                            | Anthony Kill at Mechanicville, N.Y.                      | Lat 42°55'05", long 73°42'53", at 4th Highway bridge above State Highway 146, 1.8 miles above mouth at Mechanicville.                                                                                                               | 62.4                  | 1956-61                | 8- 9-61                                  | 19.5                         |
| *3358                           | Mohawk River at Hillside, N. Y.                          | Lat 43°21'18", long 75°23'02", at bridge on Webster Hill road, 100 ft upstream from Lansing Kill, at Hillside.                                                                                                                      | 48.8                  | 1956-61                | 7-11-61                                  | 25.9                         |
| 3380                            | Oriskany Creek near Oriskany, N. Y.                      | Lat 43°08'36", long 75°20'17", at bridge on county highway, 1.1 miles south of Oriskany.                                                                                                                                            | 145                   | 1901-44, 1955, 1960-61 | 7-12-61<br>8-18-61                       | 92.9<br>56.9                 |
| 3388                            | Sauquoit Creek at New Hartford, N. Y.                    | Lat 43°04'28", long 75°17'12", at bridge on State Highways 5 and 12, at New Hartford.                                                                                                                                               | 43.4                  | 1955-56, 1958-61       | 8- 9-61                                  | 29.9                         |
| 3427                            | Moyer Creek at Frankfort, N. Y.                          | Lat 43°02'30", long 75°04'18", at bridge on State Highway 5-S, at Frankfort.                                                                                                                                                        | 21.8                  | 1954, 1956-61          | 8- 9-61                                  | 5.93                         |
| 3427.9                          | South Branch West Canada Creek near Morehouseville, N.Y. | Lat 43°23'59", long 74°44'30", at bridge on Martin's Mountain Home Road, 0.3 mile downstream from Wilmurt Lake Outlet, 0.35 mile north of State Highway 8, 1.7 miles northeast of Morehouseville, and 5½ miles upstream from mouth. | 40.2                  | 1961                   | 7-11-61<br>7-11-61<br>9-15-61<br>9-28-61 | 26.2<br>25.1<br>20.6<br>4.10 |
| *3428                           | West Canada Creek at Nobleboro, N. Y.                    | Lat 43°23'47", long 74°51'35", at bridge on State Highway 8, at Nobleboro.                                                                                                                                                          | 192                   | 1956-57, 1959-61       | 7-11-61<br>9-28-61                       | 134<br>43.2                  |
| 3472                            | East Canada Creek at Emmonsburg, N. Y.                   | Lat 43°09'14", long 74°42'45", at bridge on County Highway 104, at Emmonsburg.                                                                                                                                                      | 101                   | 1956-61                | 8-10-61                                  | 36.9                         |
| 3492                            | Canajoharie Creek at Canajoharie, N. Y.                  | Lat 42°54'19", long 74°34'18" at foot bridge near intersection of Hill and Mill Streets, at Canajoharie.                                                                                                                            | 68.4                  | 1949-50, 1956-61       | 8- 8-61                                  | 8.16                         |
| 3496                            | Schoharie Creek near Hunter, N. Y.                       | Lat 42°11'31", long 74°10'52", at bridge on State Highway 214, 2.4 miles southeast of Hunter.                                                                                                                                       | 29.2                  | 1957-61                | 9-25-61                                  | 8.12                         |
| 3497                            | East Kill near Jewett Center, N. Y.                      | Lat 42°14'57", long 74°18'11", at bridge on Lexington-Jewett highway, 1.2 miles northeast of Jewett Center, and 1.3 miles above mouth.                                                                                              | 35.2                  | 1955-61                | 9-25-61                                  | 3.08                         |
| 3498                            | West Kill at West Kill, N. Y.                            | Lat 42°12'42", long 74°23'16", at bridge on State Highway 42, at West Kill.                                                                                                                                                         | 21.2                  | 1956-61                | 9-25-61                                  | 3.35                         |
| 3499                            | Batavia Kill near Ashland, N. Y.                         | Lat 42°17'36", long 74°18'19", at bridge on Ashland-Jewett highway, 0.2 mile south State Highway 23, 1.6 miles southeast of Ashland.                                                                                                | 51.2                  | 1955-61                | 9-25-61                                  | 4.50                         |

\* Also a crest-stage partial-record station.

† Operated as a continuous-record gaging station.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at low-flow partial-record stations during water year 1962--Continued

| Station No.        | Station name                                              | Location                                                                                                                                                                                                                               | Drainage area (sq mi) | Period of record | Measurements                                                                      |                                                              |
|--------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------|
|                    |                                                           |                                                                                                                                                                                                                                        |                       |                  | Date                                                                              | Discharge (cfs)                                              |
| Hudson River basin |                                                           |                                                                                                                                                                                                                                        |                       |                  |                                                                                   |                                                              |
| *3199.3            | Sand Lake Outlet near Piseco, N. Y.                       | Lat 43°22'15", long 74°32'47", at bridge on State Highway 10, 0.9 mile upstream from mouth, and 5.5 miles south of Piseco.                                                                                                             | 7.16                  | 1962             | 7-30-62<br>9-25-62                                                                | 0.76<br>.82                                                  |
| 3335.2             | Dill Creek near Petersburg, N. Y.                         | Lat 42°45'47", long 73°21'23", at bridge on county road, 0.3 mile east of Strilham hamlet, 1.0 mile northwest of Petersburg, and 1.1 miles upstream from mouth.                                                                        |                       | 1962             | 8-9-62<br>8-23-62                                                                 | .15<br>.10                                                   |
| 3357               | Anthony Kill at Mechanicville, N. Y.                      | Lat 42°55'05", long 73°42'53", at 4th Highway bridge above State Highway 146, 1.8 miles above mouth at Mechanicville.                                                                                                                  | 62.4                  | 1954-62          | 9-21-62                                                                           | 9.77                                                         |
| 3357.5             | Deep Kill at Melrose, N. Y.                               | Lat 42°49'52", long 73°37'35", at bridge on State Highway 40, at Grant Hollow, 0.3 mile upstream from unnamed tributary and 0.7 mile south of Melrose.                                                                                 |                       | 1962             | 7-20-62<br>8-9-62                                                                 | .66<br>.22                                                   |
| 3427.9             | South Branch West Canada Creek near Morehouseville, N. Y. | Lat 43°23'29", long 74°44'30", at bridge on Martin's Mountain Home Road, 0.3 mile downstream from Wilmurt Lake Outlet, 0.35 mile north of State Highway 8, 1.7 miles northeast of Morehouseville, and 5 3/4 miles upstream from mouth. | 40.2                  | 1961-62          | 6-27-62<br>8-16-62                                                                | 15.2<br>33.0                                                 |
| *3509              | Beaverdam Creek near Knox, N. Y.                          | Lat 42°38'57", long 74°07'56", at bridge on farm road 1.2 miles south of Knox, and 1.7 miles upstream from mouth.                                                                                                                      |                       | 1962             | 7-26-62                                                                           | .01                                                          |
| *3509.5            | Switz Kill near Berne, N. Y.                              | Lat 42°36'41", long 74°09'24", at bridge on county highway, 1.2 miles upstream from mouth, and 1.3 miles southwest of Berne.                                                                                                           |                       | 1962             | 7-25-62                                                                           | .49                                                          |
| 3515.1             | Bowman Creek at Burtonsville, N. Y.                       | Lat 42°48'19", long 74°14'50", at culvert on Eaton Corners Road, 0.5 mile east of Schoharie Creek bridge at Burtonsville, and 0.7 mile upstream from mouth.                                                                            |                       | 1962             | 7-20-62<br>8-13-62                                                                | 0<br>.01                                                     |
| 3540.8             | South Chuctanunda Creek at Amsterdam, N. Y.               | Lat 42°56'04", long 74°12'44", at bridge on Florida Street, at Amsterdam, 0.2 mile downstream from State Highway 55 and 0.7 mile upstream from mouth.                                                                                  | 31.7                  | 1961-62          | 6-27-62<br>7-20-62<br>8-15-62                                                     | .42<br>.07<br>.63                                            |
| *3542              | Sandsea Kill at Pattersonville, N. Y.                     | Lat 42°53'20", long 74°04'42", at bridge on State Highway 55, at Pattersonville.                                                                                                                                                       | 9.56                  | 1957, 1959-62    | 7-19-62                                                                           | 0                                                            |
| 3544.7             | Poentic Kill at Schenectady, N. Y.                        | Lat 42°48'31", long 73°59'32", at bridge on Campbell Road at Schonowe, and 0.7 mile northwest of Schenectady City Line.                                                                                                                |                       | 1962             | 7-19-62<br>8-13-62                                                                | 2.78<br>5.18                                                 |
| 3549.5             | Crabb Kill near Glenville, N. Y.                          | Lat 42°55'58", long 74°01'00", at bridge on State Highway 147, 500 ft downstream from Fallentree Kill and 1.8 miles east of Glenville.                                                                                                 |                       | 1962             | 7-20-62<br>8-15-62                                                                | 0<br>.19                                                     |
| 3554.5             | Indian Kill near Alplaus, N. Y.                           | Lat 42°52'12", long 73°54'18", at bridge on Hetcheltown Road at Glenridge, 0.2 mile upstream from mouth, and 1.1 miles north of Alplaus.                                                                                               |                       | 1962             | 7-19-62<br>8-13-62                                                                | .50<br>1.74                                                  |
| 3563               | Shaker Creek near Latham, N. Y.                           | Lat 42°45'49", long 73°47'33", 500 ft downstream from unnamed tributary 1,000 ft downstream from State Highway 7, 1 1/4 miles upstream from mouth, and 1 3/4 miles west of Latham.                                                     | 11.2                  | 1960-62          | 4-27-62                                                                           | 8.13                                                         |
| *3591              | Wynants Kill at Wynantskill, N. Y.                        | Lat 42°41'44", long 73°38'44", at bridge on Brookside Avenue, at Wynantskill, 0.4 mile upstream from unnamed tributary, and 4 miles upstream from mouth.                                                                               | 29.1                  | 1961-62          | 4-27-62<br>6-20-62<br>7-3-62<br>8-9-62<br>8-17-62<br>8-24-62<br>9-5-62<br>9-25-62 | 19.6<br>8.56<br>5.52<br>5.64<br>5.14<br>5.44<br>5.51<br>4.63 |
| 3591.1             | Jordan Creek at Troy, N. Y.                               | Lat 42°41'15", long 73°41'38", 125 ft downstream from Jordan Road, 0.5 mile south of city line of Troy.                                                                                                                                | .65                   | 1960-62          | 4-27-62<br>7-6-62<br>8-9-62                                                       | .39<br>.13<br>.11                                            |

\* Also a crest-stage partial-record station.

Discharge measurements made at miscellaneous sites during water year 1973--Continued

| Stream                                 | Tributary to    | Location                                                                                                                                                                                                 | Drainage<br>area<br>(sq mi) | Measured<br>previously<br>(water<br>years) | Measurements |                    |
|----------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------|--------------|--------------------|
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | Date         | Discharge<br>(cfs) |
| Hudson River basin--Continued          |                 |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01330905<br>Fish Creek                 | Hudson River    | Lat 43°06'24", long 73°37'02", Saratoga<br>County, at bridge on State Highway 29,<br>in Grangerville 0.2 mile east of<br>DeGarmo Road and 2.9 miles upstream<br>from mouth.                              | -                           | -                                          | 3- 1-73      | 285                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 7-73      | 1,470              |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5- 4-73      | 480                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 6- 1-73      | 734                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-10-73      | 173                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8- 6-73      | 124                |
| 9- 7-73                                | 89              |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01333350<br>Hoosic River               | Hudson River    | Lat 42°48'33", long 73°17'12", Bennington<br>County, Vt. at bridge on State Highway<br>346 on N.Y.-Vt. State Line, 1.3 miles<br>northwest of North Pownal.                                               | 1965<br>1967-73             | 4-10-73                                    | 1710         |                    |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01335639<br>Ballston Creek             | Round Lake      | Lat 42°56'29", long 73°47'26", Saratoga<br>County, at bridge on Goldfoot Road in<br>Round Lake 0.3 mile upstream from mouth.                                                                             | 17.8                        | -                                          | 3- 3-73      | 5.3                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 7-73      | 95                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5- 7-73      | 12                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-31-73      | 26                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-10-73      | 6.5                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8- 6-73      | .79                |
| 9-14-73                                | .22             |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01335640<br>Ballston Creek             | Round Lake      | Lat 42°56'22", long 73°47'22", Saratoga County, 197<br>at bridge on Maltaville Road at Round Lake,<br>and 0.1 mile upstream from mouth.                                                                  | 197                         | -                                          | 3- 3-73      | 4.0                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 7-73      | 6.4                |
| 01335651<br>Luther Brook               | Round Lake      | Lat 42°56'41", long 73°47'04", Saratoga<br>County, at culvert on Maltaville Road<br>in Maltaville, and 0.3 mile upstream<br>from mouth.                                                                  | 3.89                        | -                                          | 5- 7-73      | 4.2                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-31-73      | 5.8                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-10-73      | 3.6                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8- 6-73      | 3.3                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 9-14-73      | 3.2                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01335657<br>Round Lake<br>Tributary #1 | Round Lake      | Lat 42°55'57", long 73°47'28", Saratoga<br>County, at culvert on U.S. Highway 9<br>in Round Lake 0.1 mile upstream from<br>mouth.                                                                        | .60                         | -                                          | 3- 2-73      | .54                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 6-73      | 3.0                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5- 7-73      | .44                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-31-73      | 1.3                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-10-73      | .23                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8- 6-73      | .23                |
| 9-14-73                                | .08             |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01335657<br>Round Lake<br>Tributary #2 | Round Lake      | Lat 42°55'43", long 73°47'30", Saratoga<br>County, at culvert on U.S. Highway 9<br>0.2 mile upstream from mouth, and 0.7<br>mile south of Round Lake.                                                    | 2.19                        | -                                          | 3- 2-73      | 1.0                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 6-73      | 7.2                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5- 7-73      | 1.3                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-31-73      | 4.6                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-10-73      | .58                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8- 6-73      | .56                |
| 9-14-73                                | .49             |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01335660<br>Round Lake<br>Tributary #3 | Round Lake      | Lat 42°56'15", long 73°46'15", Saratoga<br>County, at culvert on State Highway 67<br>0.2 mile upstream from mouth, and 0.8<br>mile southeast of Maltaville.                                              | .87                         | -                                          | 2- 8-73      | .70                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 3- 3-73      | 1.2                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 7-73      | 2.1                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5- 7-73      | .32                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-31-73      | 1.8                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-10-73      | .13                |
| 8- 6-73                                | .07             |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 9-14-73                                | .02             |                                                                                                                                                                                                          |                             |                                            |              |                    |
| 01335698<br>Anthony Kill               | Hudson River    | Lat 42°53'13", long 73°44'50", Saratoga<br>County, at Coons, at bridge on Coons<br>crossing road 0.2 mi south of State<br>Highway 67 and 2.5 mi west of Mechanicville<br>and 4.2 mi upstream from mouth. | 64.6                        | 1973                                       | 3- 3-73      | 40                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4- 7-73      | 330                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5- 7-73      | 50                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-31-73      | 135                |
| 01350101<br>Schoharie Creek            | Mohawk River    | Lat 42°23'51", long 74°27'02", Schoharie<br>County, at bridge on County Highway 342,<br>0.2 mile west of village of Gilboa, and 0.4<br>mile downstream from Gilboa Dam.                                  | -                           | 1969-72                                    | 5-14-73      | 808                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-27-73      | 1.1                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8-30-73      | .42                |
| 01350120<br>Platter Kill               | Schoharie Creek | Lat 42°24'15", long 74°26'38", Schoharie<br>County, at culvert on county road, 0.3<br>mile upstream from mouth, and 0.6 mile<br>northeast of Gilboa.                                                     | -                           | 1969-72                                    | 10- 5-72     | 1.3                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 3- 7-73      | 13                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 4-11-73      | 49                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 5-15-73      | 16                 |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 7-27-73      | 6.4                |
|                                        |                 |                                                                                                                                                                                                          |                             |                                            | 8-30-73      | 1.9                |

Discharge measurements made at miscellaneous sites during water year 1974--Continued

| Stream                                    | Tributary to | Location                                                                                                                                                                                                                           | Drainage area (sq mi) | Measured previously (water years) | Measurements |                 |
|-------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------|--------------|-----------------|
|                                           |              |                                                                                                                                                                                                                                    |                       |                                   | Date         | Discharge (cfs) |
| Hudson River basin--Continued             |              |                                                                                                                                                                                                                                    |                       |                                   |              |                 |
| 01335499<br>Hudson River<br>Tributary #15 | Hudson River | Lat 42°54'57", long 73°40'56", Saratoga County, at bridge on U.S. Highway 4, in Riverside, 100 feet (30 m) upstream from mouth, and 0.3 mile (0.5 km) northeast of Mechanicville.                                                  |                       |                                   | 8-16-74      | a 0             |
| 01335639<br>Ballston Creek                | Round Lake   | Lat 42°56'29", long 73°47'28", Saratoga County, at bridge on Goldfoot Road in Round Lake 0.3 mile (0.5 km) upstream from mouth.                                                                                                    | 17.8                  | 1973                              | 10- 9-73     | 1.99            |
| 01335651<br>Luther Brook                  | Round Lake   | Lat 42°56'41", long 73°47'04", Saratoga County, at culvert on Maltaville Road in Maltaville, and 0.3 mile (0.5 km) upstream from mouth.                                                                                            | 3.89                  | 1973                              | 10- 9-73     | 3.0             |
| 01335653<br>Round Lake<br>Tributary #1    | Round Lake   | Lat 42°55'57", long 73°47'28", Saratoga County, at culvert on U.S. Highway 9, in Round Lake 0.1 mile (0.2 km) upstream from mouth.                                                                                                 | .60                   | 1973                              | 10- 9-73     | T               |
| 01335657<br>Round Lake<br>Tributary #2    | Round Lake   | Lat 42°55'43", long 73°47'30", Saratoga County, at culvert on U.S. Highway 9, 0.2 mile (0.3 km) upstream from mouth, and 0.7 mile (1.1 km) south of Round Lake.                                                                    | 2.19                  | 1973                              | 10- 9-73     | .40             |
| 01335660<br>Round Lake<br>Tributary #3    | Round Lake   | Lat 42°56'15", long 73°46'15", Saratoga County, at culvert on State Highway 67, 0.2 mile (0.3 km) upstream from mouth, and 0.8 mile (1.3 km) southeast of Maltaville.                                                              | .87                   | 1973                              | 10- 9-73     | T               |
| → 01335698<br>Anthony Kill                | Hudson River | Lat 42°53'13", long 73°44'50", Saratoga County, at Coons, at bridge on Coons crossing road, 0.2 mile (0.3 km) south of State Highway 67, and 2.5 miles (5.6 km) west of Mechanicville, and 4.2 miles (6.8 km) upstream from mouth. | 64.6                  | 1973                              | 10- 9-73     | 15 ←            |
| → 01335703<br>Anthony Kill                | Hudson River | Lat 42°54'13", long 73°41'10", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, and 0.3 mile (0.5 km) south of State Highway 67.                                                               |                       |                                   | 8-16-74      | a 11.5 ←        |
| 01335707<br>Hudson River<br>Tributary #29 | Hudson River | Lat 42°53'13", long 73°41'14", Saratoga County, at bridge on U.S. Highway 4, at Mechanicville city line, 0.3 mile (0.5 km) upstream from mouth, and 1.4 miles (2.2 km) south of State Highway 67.                                  |                       |                                   | 8-16-74      | a 0.25          |
| 01335709<br>Hudson River<br>Tributary #30 | Hudson River | Lat 42°53'06", long 73°41'09", Saratoga County, at culvert on U.S. Highway 4, 300 feet (91 m) upstream from mouth, 0.2 mile (0.3 km) south of Mechanicville, and 1.7 miles (2.7 km) south of Mechanicville.                        |                       |                                   | 8-16-74      | a 0             |
| 01335712<br>Hudson River<br>Tributary #31 | Hudson River | Lat 42°52'47", long 73°41'01", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, 0.6 mile (1.0 km) south of Mechanicville, and 2.1 miles (3.4 km) south of State Highway 67.                    |                       |                                   | 8-16-74      | a 0.17          |
| 01335720<br>Hudson River<br>Tributary #32 | Hudson River | Lat 42°51'47", long 73°40'42", Saratoga County, at bridge on U.S. Highway 4, 250 feet (76 m) upstream from mouth, and 2.4 miles (3.9 km) southeast of Newtown.                                                                     |                       |                                   | 8-16-74      | a e 0.15        |
| 01335730<br>McDonald Creek                | Hudson River | Lat 42°51'07", long 73°40'37", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, and 2.7 miles (4.3 km) southeast of Newton.                                                                    |                       |                                   | 8-16-74      | a 1.8           |
| 01335740<br>Hudson River<br>Tributary #33 | Hudson River | Lat 42°50'22", long 73°40'30", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, and 2.5 miles (4.0 km) west of Malrose.                                                                        |                       |                                   | 8-16-74      | a 0.76          |
| 01335744<br>Hudson River<br>Tributary #34 | Hudson River | Lat 42°50'04", long 73°40'12", Saratoga County, at bridge on U.S. Highway 4, 400 feet (122 m) upstream from mouth, 2.2 miles (3.5 km) west of Grant Hollow, and 2.6 miles (4.2 km) north-east of Waterford.                        |                       |                                   | 8-16-74      | a e 0.5         |

a A general ephemeral study made on August 16 of all stream channels in a localized area.

e Estimated.

T Trace.

|                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                 |      |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01335698                                                                                                                         | Anthony Kill at Coons.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 42 55 13 73 44 50 091                                                                                                                                                                                                                                                           | 64.6 | 3- 3-73<br>4- 7-73<br>5- 7-73<br>5-31-73<br>7-10-73<br>8- 6-73<br>9-14-73<br>10- 9-73<br>5-26-54<br>9- 2-54<br>9-15-54<br>9-27-54<br>10-17-54<br>8-16-56<br>8-30-56<br>5-10-57<br>8-14-58<br>10-10-58<br>4- 2-59<br>4-22-59<br>6- 6-60<br>8- 9-60<br>8- 9-61<br>9-21-62<br>8-16-74<br>8-16-74<br>8-16-74<br>8-16-74<br>8-16-74<br>8-16-74<br>8-16-74 | *40.1<br>330<br>50.1<br>135<br>*9.15<br>21.8<br>*12.1<br>*15.4<br>*123<br>*31.5<br>*19.5<br>*18.7<br>*28.6<br>*12.5<br>*22.3<br>*11.0<br>*12.5<br>*210<br>*73.1<br>*213<br>*23.6<br>*19.5<br>*9.77<br>*11.5<br>*25<br>0<br>*17<br>*15<br>*1.8<br>*76<br>*a.05<br>*a.3<br>*9.90<br>*9.59<br>*8.7 |
| 01335700                                                                                                                         | Anthony Kill at Mechanicsville.....<br>(includes Plum Brook watershed)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 12 55 05 73 42 53 091                                                                                                                                                                                                                                                           | 62.4 |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                 |
| 01335703<br>01335707<br>01335709<br>01335712<br>01335720<br>01335730<br>01335740<br>01335744<br>01335760<br>01335785<br>01335800 | Anthony Kill at Mechanicsville.....<br>Hudson River tributary no. 29 at<br>Mechanicville.....<br>Hudson River tributary no. 30 at<br>Mechanicville.....<br>Hudson River tributary no. 31 at<br>Mechanicville.....<br>Hudson River tributary no. 32 near Newtown<br>McDonald Creek near Newtown.....<br>Hudson River tributary no. 33 near Melrose<br>Hudson River tributary no. 34 near<br>Waterford.....<br>Hudson River tributary no. 35 near<br>Waterford.....<br>Mohawk River, West Branch, at West Branch.<br>Mohawk River at Hillside..... | 42 54 13 73 41 10 091<br>42 53 13 73 41 14 091<br>42 53 06 73 41 09 091<br>42 52 47 73 41 01 091<br>42 51 47 73 40 42 091<br>42 51 07 73 40 37 091<br>42 50 22 73 40 30 091<br>42 50 04 73 40 12 091<br>12 49 00 73 39 57 091<br>43 22 05 75 28 52 065<br>43 21 18 75 23 02 065 |      |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                 |

APPENDIX D

REFERENCES

## APPENDIX B

### REFERENCES

- 1) B.B. Eissler; Low-Flow Frequency Analysis of Streams in New York - Bulletin 74; U.S. Geological Survey 1979.
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- 5) HEC-1 Flood Hydrograph Package - Dam Safety Version, September 1978.
- 6) Engineering Manual 1110-2-1405; Flood-Hydrograph Analyses and Computation, August 1959.
- 7) U.S. Department of Agriculture, Soil Conservation Service; National Engineering Handbook; Section 4 -Hydrology, August 1972.
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- 9) US Department of Interior; BUREC  
Design of Small Dams, 2nd edition (rev.reprint), 1977.
- US Geological Survey:
- 10) Water Resources Data for New York - 1961; Part 1-Surface Water Records
- 11) Water " " " " " - 1962;
- 12) Water " " " " " - 1973;
- 13) Water " " " " " - 1974;

APPENDIX E

DRAWINGS AND RELATED DOCUMENTS



**LUTHER FOREST**

**TAC LUTHER FOREST CORPORATION**

**THE ARCHITECTS COLLABORATIVE**

**SARATOGA COUNTY**

**ALBANY**

**NEW YORK**

**CAMBRIDGE MASSACHUSETTS**

**PHYSIOGRAPHY**

**LEGEND**

|  |                              |
|--|------------------------------|
|  | Well Drained Area            |
|  | Moderately Well Drained Area |
|  | Poorly Drained Area          |

**CHARACTERISTICS**

|  |                        |
|--|------------------------|
|  | High Peaks             |
|  | Low Peaks              |
|  | Major Watershed Divide |
|  | Topographic Divide     |
|  | Ridge Lines            |
|  | Topographic Edges      |

**TOPOGRAPHIC**

|  |                      |
|--|----------------------|
|  | Wetland              |
|  | Open Water           |
|  | Ephemeral Streams    |
|  | Intermittent Streams |
|  | Perennial Streams    |

**HYDROLOGIC**

|  |                      |
|--|----------------------|
|  | Wetland              |
|  | Open Water           |
|  | Ephemeral Streams    |
|  | Intermittent Streams |
|  | Perennial Streams    |

Section III sewage will be handled by approved on-site sewage disposal systems.

3. Storm Water System

Section I storm water drainage occurs primarily vertically through the highly porous sand to a water table of 20 ft. below the surface and then runs horizontally to the mouth of the ravines where it emerges as streams which run either northerly to Saratoga Lake or southerly to Round Lake. No water in Section I drains into Section II.

Section II lies in four watersheds: A small portion in its southwesterly corner drains to Round Lake, its northwest corner drains to Saratoga Lake, its northeasterly corner drains into Schuyler Creek, and its southeasterly corner drains to the Mechanicville Reservoir and Plum Brook. Obviously drainage toward the Mechanicville Reservoir and Plum Creek is environmentally sensitive since these are water sources for the City of Mechanicville. The environmental impacts will be properly addressed and mitigated in the environmental impact statement on Section II.

Section III has 980 acres in the Saratoga Lake watershed; 66 acres are in the Schuyler Creek watershed.

4. Traffic

Section I traffic will be directed by way of Plains Road and Dunning St. onto either Route 9 or Northway Exit 12. A small portion of the traffic from the northern end of Section I may create traffic on Plains Road to Route 9P to Route 9 to Exit 13.

Section II northbound traffic will be directed to Lake Road, 9P, 9, and then Exit 13. Southbound traffic from Section II will be directed to Route 67 to Route 9 to Exit 10 on the Northway. Westbound traffic will use either the northbound or southbound route to Route 9 and then to Route 67. Eastbound traffic from Section II is adequately served by existing roads.

## 7. Zoning

A Master Plan (Figure 4), has been prepared on all three sections.

Section I also has been re-zoned in accordance with the zoning plan, (Figure 5), and a site plan (Figure 6), attached. It can be seen from the site plan that the option to use Area 4 of the zoning map as a light manufacturing area has been taken and that the current market conditions indicate that Areas 1, 2, and 3 will be predominantly and perhaps exclusively single family detached homes. The rest of the area in Section I north of Dunning St. may or may not develop with the housing mix shown.

→ Section II has neither been re-zoned nor planned beyond the Master Plan shown in Figure 4.

Section III, the first subdivision of 10 mini-estates, was approved on May 16, 1977 and is attached as Figure 7. All 10 lots in the first subdivision have been sold. The second subdivision consisting of Mini-estates Nos. 11 - 22 was approved by the Stillwater Planning Board on June 19, 1978, and is attached as Figure 8. All the land within Section III is already zoned rural residential which permits a single family dwelling on one acre lots with 150 ft. of frontage. As can be seen on the first two mini-estate subdivision maps attached as Figures 7 and 8, the mini-estates exceed the zoning specifications.

## 8. Statement Supporting Separation of Luther Forest into Three Distinct Sections

It has been demonstrated above that the environmental and engineering factors are separate for each of the three sections of this project. Therefore it is concluded that the public's interests are best served by reviewing Luther Forest as three separate and distinct projects with primary impact on different communities and facilities.

In addition to the logical geographic and political separation of these three areas for the purposes of such a statement, is the question of timing. It would perhaps be to the developer's best interests "to sweep" Section II through along with the approval of Section I because environmental laws are continually becoming more stringent. However, this would require projecting unknowns so far into the future that the statement would really be of marginal value for planning purposes. The Section I rate of development is limited to a maximum of 200 residential units per year by Section 7 of the Planned Development District Legislation (attached as Appendix B). This implies that it would be at least 8 years before construction occurs in Section II. The developer feels that a more accurate and valid environmental impact statement can be written on Section II after observing the actual experience with implementation of Section I.

As shown above, Section III exceeds existing zoning requirements, is of low density (consisting of approximately 110 mini-estates widely distributed over 1,046 acres) and is based on known well and septic system information in the area. Further, from the experience drawn from the demographic profiles of the purchasers of the first 10 mini-estates in Section III it is clear that these are primarily purchased by working professional couples with no children.

In the developer's view the preparation of an environmental impact statement on Section III would not result in identifying any adverse environmental impact or alter the planning in any meaningful way. Therefore, this environmental impact statement will cover only Section I (Malta).

#### C. Type of Action

Luther Forest received Planned Development District zoning approval from the Town Board of Malta on August 30, 1977. New zoning is best shown by the map and tables already attached as Figure 5. The legislation enabling this rezoning

soils on the property are deep and moderately to rapidly permeable. Over two-thirds of the property is covered by the Colonie series of soils; these are deep, well to excessively drained, very strongly acidic, coarse textured soils. Muck soil, essentially undrained organic matter, silt and clay, is found in closed depressions. Other less well drained soils are located primarily in topographic lows such as swales and stream valleys.

In addition to differentiating among soil types, the attached soils map, Figure 9, indicates erosion potential and slope. U.S.D.A. Soil Conservation Service nomenclature are used on the map. Figure 10 lists the U.S.D.A. constraints for each soil.

Brief soil descriptions from data provided by the U.S.D.A. Soil Conservation Service of the major soil types found in Luther Forest follow:

Alluvial Land: Alluvial land is made up of materials that have washed from adjacent uplands. It occurs along minor streams on small terraces and nearly flat, narrow bottoms of stream valleys. Drainage ranges from good to very poor. Most alluvial land is made up of recent soil material; however, materials from remnants of small terraces are included in some areas.

Colonie Series: Colonie soils are deep, well to excessively drained, very strongly acidic, coarse textured soils that have formed in deltaic or aeolian sands. They occupy nearly level to gently rolling areas and moderately steep to steeply dissected landforms. Colonie soils have 4 to 12 feet or more of rapidly permeable, yellowish-brown fine sands and loamy fine sands that contain moderately permeable, thin brown bands of finer textured material.

Hoosic Series: These are deep, well-drained, strongly acidic, gravelly soils developed on stratified out-washes which are composed chiefly of acidic slates, shale and sandstone. They occupy nearly level to steeply rolling areas. Hoosic soils have from 2 to 3 feet of rapidly permeable, yellowish-brown, gravelly loam and sandy loam over very rapidly permeable stratified sand and gravel.

Hudson Series: Hudson soils are deep, moderately well to well drained, medium acid to neutral, fine textured soils that form in calcareous clayey glacial lake deposits. They occupy level to dissected lake plains. Hudson soils have 1 to 2 feet of moderately to slowly permeable silt loam or silty clay loam over slowly permeable silty clay to a depth of  $3\frac{1}{2}$  feet. These materials are underlain by slowly permeable lake-laid deposits consisting of layers of silty clay or clay separated by thinner silty layers.

Muck: These are areas of undifferentiated kinds of organic soils. They include areas of mostly decomposed muck from woody plants, sedges, reeds, cattails and rushes as well as more limited areas of almost undecomposed peat. These deposits vary from more than 20 inches to 20 feet thick, over clay, marl or sand. They occur in closed depressions that have remained undrained for the most part.

Stafford Series: Stafford soils are deep, somewhat poorly drained, strongly to slightly acidic, coarse textured soils that formed in moderately acidic to neutral deltaic or aeolian sands. They occupy nearly level to gently sloping areas of sandy deltas and plains. Stafford soils have  $1/2$  to 1 foot of loamy fine sand over 3 to 10 feet of rapidly permeable loamy fine sand or fine sand.

..."it is the intent of the Legislature that all agencies conduct their affairs with an awareness that they are the stewards of the air, water, land and living resources and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations."

It is felt that through the new Environmental Laws and through cooperation, both ERDA and Luther can function to provide new jobs and maintain a high sensitivity to the quality of the environment.

## II. ENVIRONMENTAL FACTORS AND IMPACTS

### A. Geology and Soils

#### 1. Geological character, bedrock and surficial

The rock underlying Luther Forest consists primarily of black shale with local interbedded sandstone. Canojoharie shale underlies most of the tract while the Austin Glen and Mount Merino Formations underlie part of the east side of the property. Bedrock is exposed in several places in or adjacent to Luther Forest. Elsewhere bedrock lies buried beneath thick glacial lake and aeolian sediments generally to a depth of 50 to 200 feet, even in the ravines. Bedrock in the central and western portions of the property is crossed by the north-south trending main channel of the preglacial Hudson River known as the Colonie Channel. The deepest part of the channel is estimated to be below elevation 100 feet or well over 200 feet beneath the surface.

A generalized bedrock topography map for eastern Saratoga County, adapted from Stearns and Wheler, 1968, is shown on Page 41 of Exhibit 10.

#### 2. Soils Characteristics

The major portion of the Luther Forest is covered by deltaic and aeolian sands (see Figure 9). Most of the

21.

The area is not well suited to agricultural use. The Colonie fine sandy loam soil which covers over two-thirds of the project area is well drained (dry) and does not support an abundant plant life.<sup>1</sup>

### 3. Slopes and Topography

Slopes vary from near 0% on flat terraces up to 60% in deeply dissected ravines. With the exception of steep slopes the potential for soil erosion, mass wasting and run-off are low throughout the Luther Forest.

Figure 11 is a topographic map of the Luther Forest and adjacent land.

### 4. Landforms

Landforms within Luther Forest reflect clearly the strong influence of glaciation as well as post-glacial surficial processes. During glaciation drainage of the ancestral Hudson River was blocked south of Kingston, New York, creating a large lake known as Lake Albany, which extended well north of the site. Fine sand, silt and clay were deposited in the Lake, blanketing hundreds of square miles. Additional unconsolidated sediment was deposited on and around Luther Forest by a southward flowing stream which entered Lake Albany near the south end of what is now Saratoga Lake, creating an extensive delta known as the Malta Delta. Surficial expression of this delta, which comprises a major portion of the Luther tract, is a plain highest directly south of Saratoga Lake, decreasing gradually in elevation to the southeast and west. Average elevation of the plain is 350 feet above sea level. Several hills reach 430 feet. Streams emanating radially from the central portion of the site have down-cut the unconsolidated fine sands to elevations as low as 207 feet, forming narrow, steep-sided ravines.

<sup>1</sup>Letter from James A. Moredock, Agronomist -to- William R. Mackay, May 2, 1978 (See Figure 21)

# Developer assures city he will consult it on project plan

6-18-78

By CLAYTON BOYCE  
Staff Writer

MECHANICVILLE — The developer of the 6,800 acre Luther Forest housing project assured city officials Wednesday he will consult them before beginning construction of the Stillwater section of the project.

The city officials are concerned that the drilling of wells to supply the Stillwater section with water will threaten the city's reservoir.

William R. Mackay, president of the Luther Forest Corporation, said he has withdrawn applications for the the Stillwater section of the development, and it will be at least two years before construction of the section begins. "When we start working on the Stillwater section, we'll come to you," Mackay promised during a meeting with the City Council.

Mackay and D. Theodore Clark, a hydro-geologist hired by the Luther Forest Corporation, said the 2,157 acre Malta section of the development will have no effect on the city's reservoir in the Town of Stillwater. Clark said wells drilled at a sandy site off Knapp Road near Maltaville will provide 600 to 700 gallons per minute, enough for the Malta section of the development.

According to a report Clark prepared for the engineer of the Luther Forest development, the watershed tapped by the Maltaville wells is separate from the watershed that feeds the city's reservoir. Clark said the well site has "a different watershed, a different aquifer, different everything."

Mackay said he withdrew the applications for the Stillwater section because "we realize there are problems there." He said the corporation "didn't have the money to spend" to solve the problems. It could be as long as seven years before the Stillwater section is begun, he said, depending on the success of the Malta section.

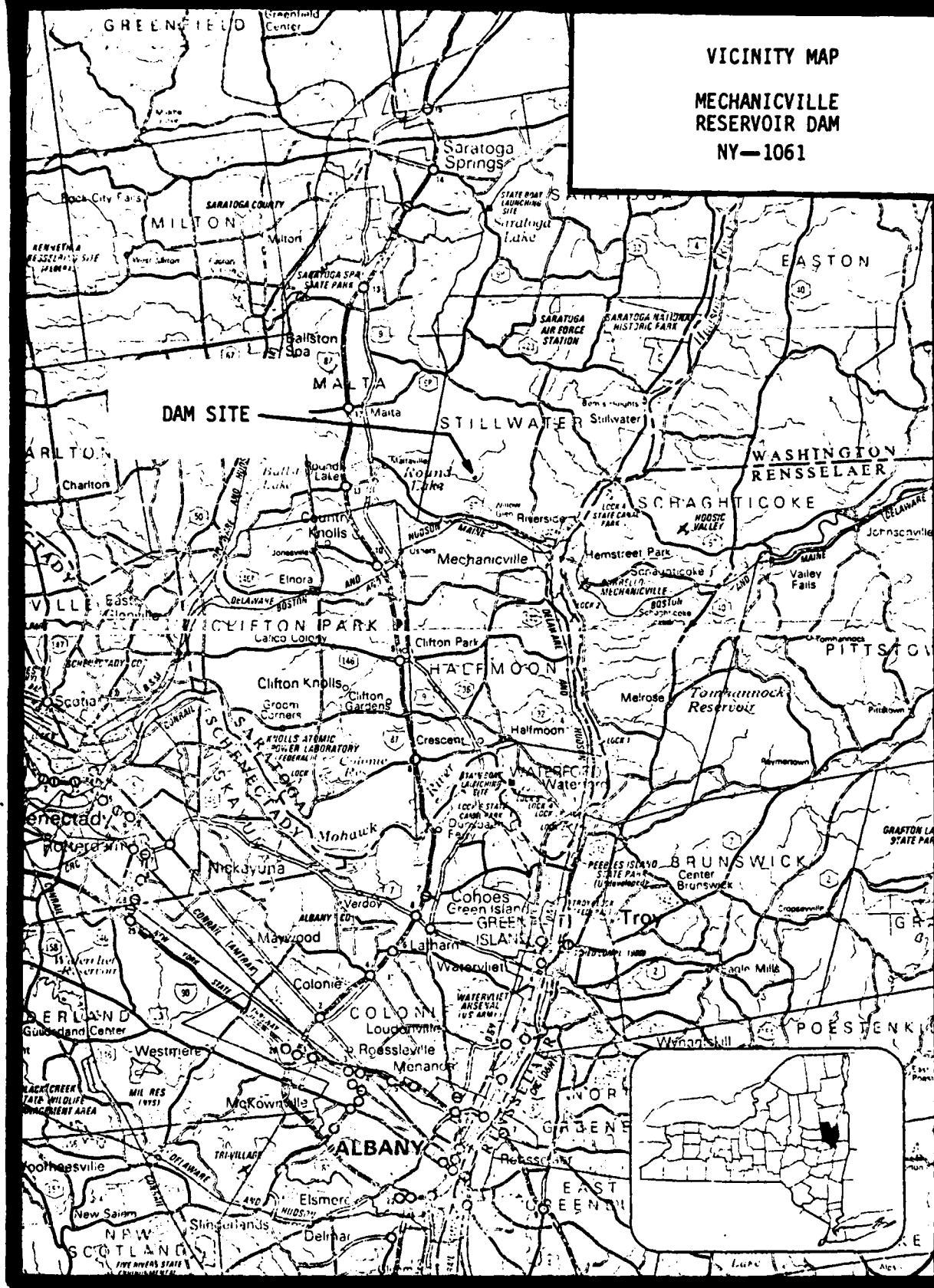
Mayor John H. Fascia said he has "no objections to plans for Malta." But "our watersupply is our livelihood," he said.

Mason Barber, city water

superintendent, said the developer could build south of County Highway 75, and still not affect the watershed feeding the city reservoir. Mackay replied he will "certainly talk to (city officials) if we go south of 75."

C-54

MECHANICVILLE  
RESERVOIR DAM  
NY-1061



**SARATOGA COUNTY**

