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NATIONAL DAM SAFETY PROGRAM. ALLAMUCHY POND DAM (NJ00501), DELA--ETC(U)
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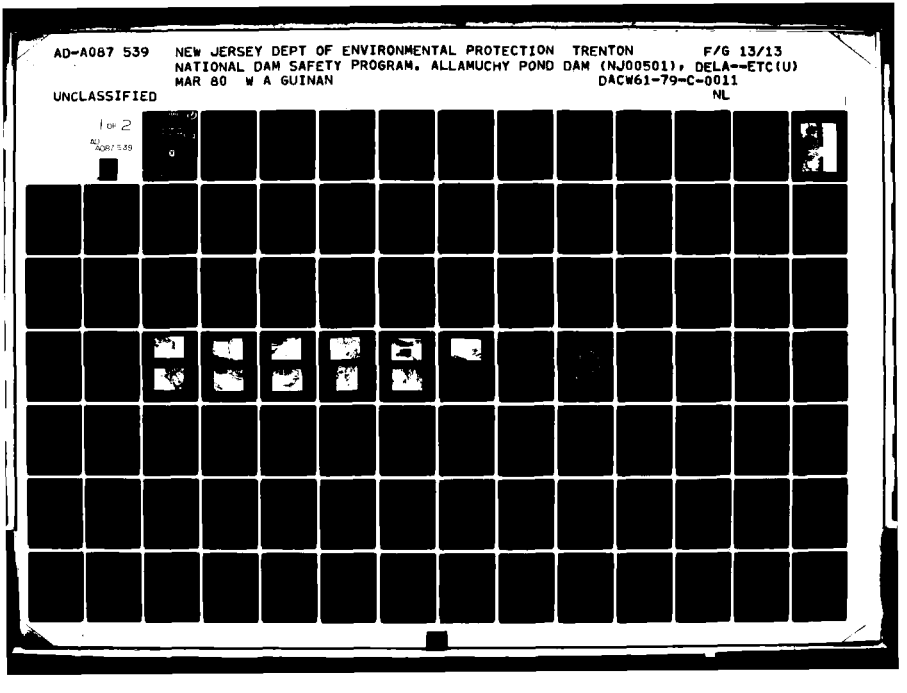

LEVEL II

DELAWARE RIVER BASIN
TRIBUTARY TO PEQUEST RIVER
WARREN COUNTY, NEW JERSEY

ALLAMUCHY POND DAM NJ 00501

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

DEPARTMENT OF THE ARMY
Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

MARCH 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

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3. RECIPIENT'S CATALOG NUMBER:	
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18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia 22151.

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Dams
Embankments
Visual Inspection
Structural Analysis
Erosion
National Dam Safety Program
Allamuchy Pond Dam, New Jersey
Seepage

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

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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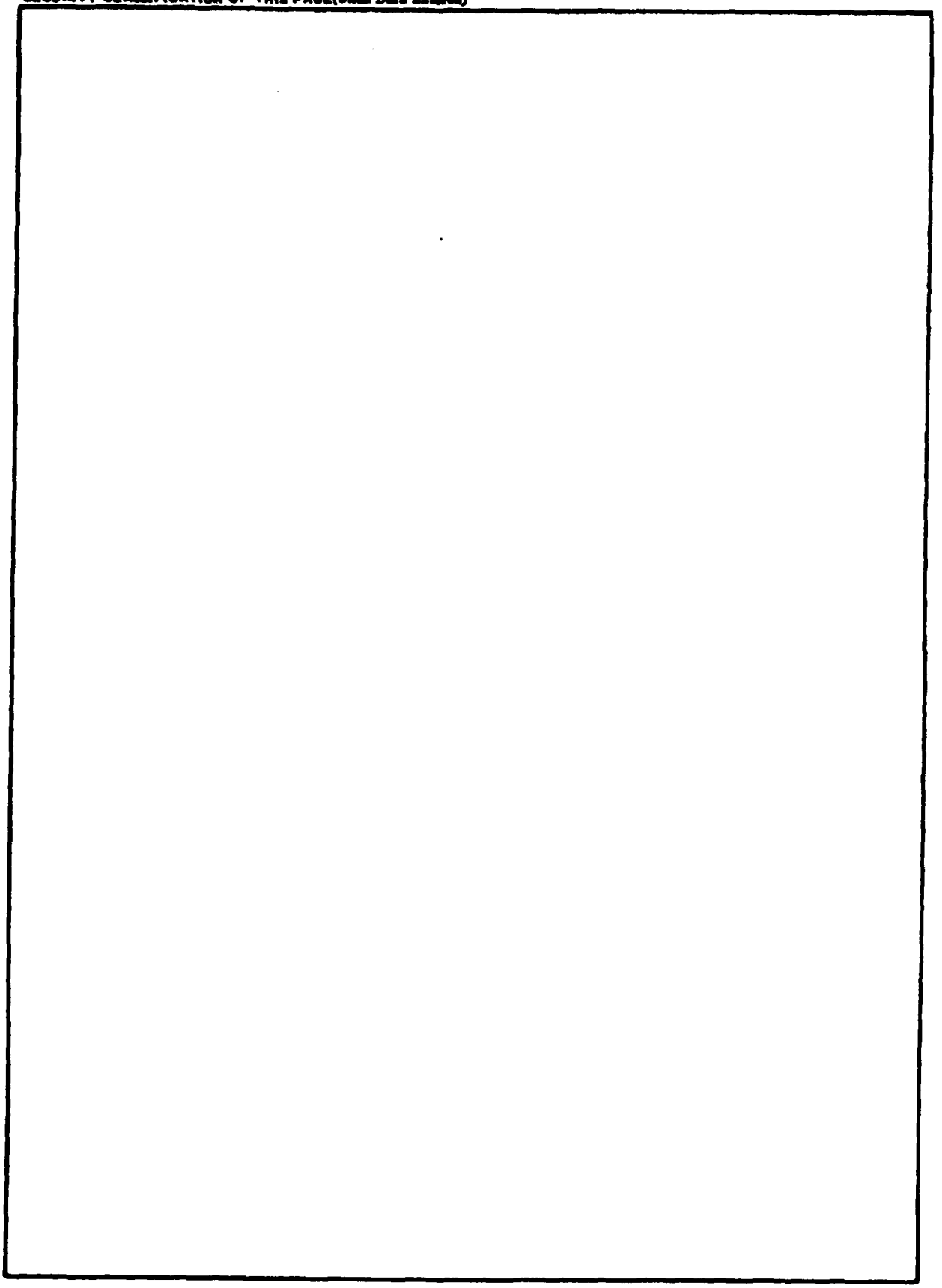


DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE--2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-N

29 JUL 1980

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Allamuchy Pond Dam in Warren County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Allamuchy Pond Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in poor overall condition. The dam's spillway is considered inadequate because a flow equivalent to nine percent of the Spillway Design Flood - SDF - would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood.) To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure spillway adequacy should be initiated.

b. The following remedial actions should be initiated within thirty days from the date of approval of this report:

(1) Start a program of regularly checking the overall condition of the dam.

(2) Remove the log from the entrance to the spillway.

(3) Clear debris from the discharge channel downstream of the spillway.

c. The following remedial actions should be initiated within three months from the date of approval of this report:

(1) Clear trees and brush from the discharge channel on either side of the discharge channel for some distance downstream from the dam, to prevent blockage of the channel by windfalls.

(2) Establish a surveillance program for use during and immediately after periods of heavy rainfall, and also a warning program to follow in case of emergency conditions.

d. Within three months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Specify, oversee and implement procedures for removal of trees from the bank and a zone 25 feet wide at the downstream toe of the dam and to allow for adequate identification of seepage problems.

(2) Inspect the dam after trees, brush and brambles have been cleared from the embankment.

(3) Investigate the cause of the holes on the crest of the dam and the seepage on the bank of the downstream channel and design remedial measures, if needed.

e. Within six months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Design and implement repairs for the dry stone-masonry wall on the upstream slope of the dam.

(2) Design and implement repairs for the erosion that has occurred on the west bank of the downstream channel.

(3) Restore the low-level gate operating mechanism to an operable condition and provide a downstream outlet to the discharge pipe.

f. Within one year from the date of approval of this report, the owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Courter of the Thirteenth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

NAPEN-N
Honorable Brendan T. Byrne

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Inspection Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

ALLAMUCHY POND DAM (NJ00501)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 6 November 1979 by Anderson-Nichols & Co., Inc., under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Allamuchy Pond Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in poor overall condition. The dam's spillway is considered inadequate because a flow equivalent to nine percent of the Spillway Design Flood - SDF - would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood.) To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure spillway adequacy should be initiated.

b. The following remedial actions should be initiated within thirty days from the date of approval of this report:

(1) Start a program of regularly checking the overall condition of the dam.

(2) Remove the log from the entrance to the spillway.

(3) Clear debris from the discharge channel downstream of the spillway.

c. The following remedial actions should be initiated within three months from the date of approval of this report:

(1) Clear trees and brush from the discharge channel on either side of the discharge channel for some distance downstream from the dam, to prevent blockage of the channel by windfalls.

(2) Establish a surveillance program for use during and immediately after periods of heavy rainfall, and also a warning program to follow in case of emergency conditions.

d. Within three months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Specify, oversee and implement procedures for removal of trees from the bank and a zone 25 feet wide at the downstream toe of the dam and to allow for adequate identification of seepage problems.

(2) Inspect the dam after trees, brush and brambles have been cleared from the embankment.

(3) Investigate the cause of the holes on the crest of the dam and the seepage on the bank of the downstream channel and design remedial measures, if needed.

e. Within six months from the date of approval of this report, engineering studies and analyses should be performed to:

(1) Design and implement repairs for the dry stone-masonry wall on the upstream slope of the dam.

(2) Design and implement repairs for the erosion that has occurred on the west bank of the downstream channel.

(3) Restore the low-level gate operating mechanism to an operable condition and provide a downstream outlet to the discharge pipe.

f. Within one year from the date of approval of this report, the owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

APPROVED: James G. Ton

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 6 JUN 80

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Allamuchy Pond Dam
Identification No.:	FED ID No. NJ00501
State Located:	New Jersey
County Located:	Warren
Stream:	Unnamed Tributary to Pequest River
River Basin:	Delaware
Date of Inspection:	6 November 1979

ASSESSMENT OF GENERAL CONDITIONS

Allamuchy Pond Dam is an old dam of undetermined age and is in poor condition. It is small in size and is recommended to be downgraded to Significant Hazard. The dam embankment is covered with a heavy growth of trees, brush, and brambles and has two holes about one foot deep in the crest. The spillway can pass 8 percent of the PMF. It is inadequate.

It is recommended that the owner retain the services of a professional engineer, qualified in the design and construction of dams to accomplish the following very soon: conduct further detailed hydrologic and hydraulic analyses of the watershed, reservoir, dam, spillway and downstream area to determine the extent and type of mitigating measures necessary; design or specify and implement procedures for removal of trees and their root masses from the bank and a zone 25 feet wide at the downstream toe of the dam to allow for identification of seepage problems; inspect the dam after trees, brush and brambles have been cleared from the embankment. An investigation into the cause of the holes on the crest of the dam and the seepage on the bank of the downstream channel should start soon. Starting in the near future the owner should: design and implement repairs for the dry stone masonry wall on the upstream slope of the dam and design and implement repairs for the erosion that has occurred on the west bank of the downstream channel. In the future the owner should restore the low-level gate operating mechanism to an operable condition and provide a downstream outlet to the discharge pipe. It is further recommended that starting immediately the owner should: start a program of regularly checking the overall condition of the dam; remove the log from the entrance to the spillway and clear debris from the discharge channel downstream of the spillway. Additionally, the owner should do the following soon: clear trees and brush from the discharge channel and on either side of the discharge channel for some distance downstream from the dam to prevent blockage of the channel by windfalls; establish a surveillance program for use during and immediately after periods of heavy rainfall, and also a warning program to follow in case of emergency conditions. Within one year from the date of approval of this report, the owner should develop

written operating procedures and a periodic maintenance plan to insure the safety of the dam.

ANDERSON-NICHOLS & COMPANY, INC.

Warren A. Guinan

Warren A. Guinan, P.E.
Project Manager
New Jersey No. 16848

5 NOVEMBER 1979

OVERVIEW
ALLAMUCHY POND DAM

CONTENTS

PHASE I INSPECTION REPORT
ALLAMUCHY POND DAM FED ID NO. NJ00501 NJ NO. ---

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY INSPECTION PROGRAM
ALLAMUCHY POND DAM
FED ID NO. NJ00501 NJ NO. ---

1.1 General

a. Authority. Authority to perform the Phase I Safety Inspection of Allamuchy Pond Dam was received from the State of New Jersey, Department of Environmental Protection, Division of Water Resources by a letter dated 26 October 1979, under Contract FPM No. 39 dated 28 June 1978. This authority was given pursuant to the National Dam Inspection Act, Public Law 92-367 and by agreement between the State and the U.S. Army Engineer District, Philadelphia. The inspection discussed herein was performed by Anderson-Nichols & Company, Inc. on 5 November 1979.

b. Purpose. The purpose of the Phase I Investigation is to develop an assessment of the general conditions with respect to the safety of Allamuchy Pond Dam and appurtenances based upon available data and visual inspection and determine any need for emergency measures and conclude if additional studies, investigations and analyses are necessary and warranted.

1.2 Project Description

a. Description of Dam and Appurtenances. Allamuchy Pond Dam is an old 13-foot high, 175-foot long earth embankment of undetermined age. The upstream and downstream faces of the dam are walls of dry masonry and are vertical. The dam embankment topwidth varies from 24 to 43 feet. The 14-foot long free overflow spillway is 100 feet from the west abutment. The spillway is an inclined concrete capped stone masonry structure and measures 43 feet upstream to downstream. A wooden footbridge spans the spillway. A gated 4' x 8' intake for a former water power penstock is located 70 feet from the west abutment. Essential features of the dam are given in Figures 1 and 2.

b. Location. The dam is located in Allamuchy Township, Warren County, New Jersey on an unnamed tributary to the Pequest River. The Pequest River is in the Delaware River watershed. The dam is at north latitude 40° 54.8' and west longitude 74° 56.3'. A location map is given in Figure 3.

c. Size Classification. Based on its estimated storage of 407 acre-feet, which is less than 1000 acre-feet, but more than 50 acre-feet, and its height of 13 feet, which is less than 40 feet, Allamuchy Pond Dam is classified as small in size, in accordance with the criteria given in the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. Visual inspection of the downstream area and the analyses contained herein shows that overtopping of Allamuchy Pond Dam could cause excessive damage to one commercial structure located downstream of the dam. The potential exists for loss of a few lives. Accordingly, Allamuchy Pond Dam is classified as Significant Hazard.

e. Ownership. Tax maps for Allamuchy Township show that the dam is owned by the State of New Jersey, Department of Environmental Protection, Division of Labor and Industry Building, Trenton, New Jersey 08625, Telephone (603) 292-2203.

f. Purpose of Dam. The original use of Allamuchy Dam is unknown. It is presently used for recreation.

g. Design and Construction History. No design or construction data pertinent to Allamuchy Pond Dam were available.

h. Normal Operational Procedures. No operational procedures pertinent to Allamuchy Pond Dam were available.

i. Site Geology. No site specific geologic information (such as borings) was available at the time the dam was inspected. Information derived from the Geologic Map of New Jersey (Lewis and Kummel, 1912) indicates that soils within the immediate site area consist of ground moraine overlying bedrock. Although bedrock was not observed during inspection of this dam, the previously mentioned map indicates that the underlying bedrock in this area consists of granitoid gneiss of Precambrian age.

1.3 Pertinent Data

a. Drainage Area

1.6 square miles

b. Discharge at Damsite (cfs)

Maximum flood at damsite - unknown

Total spillway capacity at maximum pool elevation (at top of dam) - 113

c. Elevation (ft. NGVD)

Top of dam - 797.1

Maximum pool - design surcharge (½ PMF) - 799.9

Spillway crest - 795.0

Streambed at centerline of dam - 784.1

Maximum tailwater (estimated) - 792

d. Reservoir (feet)

Length of maximum pool (estimated) - 4100

Length of recreation pool - 3000

e. Storage (acre-feet)

Spillway crest - 280

Top of dam - 407

Design surcharge (½ PMF) - 629

f. Reservoir Surface Area (acres)

Top of dam - 68

Spillway crest - 51

g. Dam

Type - earth embankment with vertical dry masonry upstream and downstream faces

Length - 175± feet

Height - 13 feet

Topwidth - varies from 24 to 43 feet

Side slopes - upstream - vertical

downstream - vertical

Zoning - unknown

Impervious core - unknown

Cutoff - unknown

Grout curtain - unknown

h. Spillway

Type - broad crested free overflow concrete capped masonry

Length - 14 feet

Crest elevation - 795.0 NGVD

Gates - none

Upstream channel - Allamuchy Pond

Downstream channel - unnamed tributary to the Pequest River

i. Outlet Works

One 4' x 8' opening formerly used for a water power intake. The penstock that this opening fed is badly deteriorated and laying in rusted unconnected sections downstream. The intake is not operable.

SECTION 2
ENGINEERING DATA

2.1 Design

No original plans, hydraulic or hydrologic data for Allamuchy Pond Dam were found.

2.2 Construction

No data concerning the original construction of Allamuchy Pond Dam were revealed.

2.3 Operation

No engineering operational data were available.

2.4 Evaluation

a. Availability. No recorded information concerning Allamuchy Pond Dam was found. The state maintains no file on this dam.

b. Adequacy. Because of the lack of recorded information available, evaluation of the dam was based solely on visual observations.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. Dam. The concrete apron and training walls of the spillway are cracked and spalled. Two small holes about 6 to 12 inches deep were observed on the crest of the dam between the spillway and west abutment approximately 20 feet and 45 feet from the spillway. Additionally two major seepages discharge from the west bank of the discharge channel immediately downstream of the spillway. Brush is growing on the upstream vertical slope between the spillway and the west abutment. A dense growth of brush and brambles is growing on the upstream vertical slope between the spillway and the east abutment and on the crest. Brush and brambles are also growing on the downstream vertical slope. Trees are growing close to the downstream toe of the dam. The dry stone-masonry walls which retain the embankment both upstream and downstream are in poor condition. The gate operating mechanism for the former penstock is in fair condition with no indication of recent operation. The pipe from the intake structure was not visible at the time of inspection. The penstock is badly deteriorated and laying in rusted unconnected sections downstream. The wooden footbridge across the spillway is badly deteriorated with loose deck planking.

b. Appurtenant Structures. A log is lodged at the entrance to the spillway. A large piece of concrete on the west bank of the spillway discharge channel appears to be a remnant of a training wall that has fallen over. However, since a considerable quantity of debris has been dumped in the same general area, it is not certain that this concrete is, in fact, the remnant of a training wall.

c. Reservoir Area. The watershed above the pond is moderately to steeply sloping. The reservoir slopes appear to be stable. No evidence of significant sedimentation was observed.

d. Downstream Channel. Considerable erosion has occurred on the west bank of the channel immediately downstream of the spillway. Trees and brush and some debris are in the channel and trees overhang the channel. Twelve hundred feet downstream of Allamuchy Pond Dam, a 60 foot high embankment for Interstate 80 spans the outlet channel valley. The stream is carried beneath the embankment by a culvert approximately 8 feet in diameter. The potential damage area is 2600 feet downstream of the interstate culvert where the stream passes through the center of Allamuchy. The entire reach from the dam to the potential damage area is very steep.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedures

No operating procedures were revealed.

4.2 Maintenance of Dam

No maintenance procedures for the dam embankment and spillway were available. From the condition of the dam and spillway it is apparent that a regular maintenance program has not been followed.

4.3 Maintenance of Operating Facilities

The operating facilities of the former water power intake and penstock have not been maintained and are presently in severe disrepair. Maintenance for the operating facilities has not taken place for an undetermined number of years.

4.4 Warning System

No description of any warning system was disclosed.

4.5 Evaluation of Operational Adequacy

Because of the lack of operation and maintenance procedures, the remedial measures described in Section 7.2 should be implemented as prescribed.

SECTION 5
HYDROLOGY AND HYDRAULIC ANALYSIS

5.1 Evaluation of Features

a. Design Data. Because no design data were available, an evaluation could not be performed.

b. Experience Data. No experience data were revealed concerning past embankment overtopping.

c. Visual Observations. No visual evidence of damage due to overtopping was observed. At the time of inspection, approximately 0.3 foot of water was flowing over the spillway.

d. Overtopping Potential. The hydraulic/hydrologic evaluation for Allamuchy Pond Dam is based on a selected Spillway Design Flood (SDF) equal to one-half the Probable Maximum Flood (PMF) in accordance with the range of test floods given in the evaluation guidelines for dams classified as significant hazard and small in size. The PMF has been determined by application of the SCS Dimensionless Unit Hydrograph procedure to the 24-hour probable maximum storm of 22.5 inches. Hydrologic computations are given in Appendix 3.

The Interstate 80 highway embankment crosses the discharge channel approximately 1200 feet downstream of the dam. A corrugated metal plate pipe, approximately 8 feet in diameter passes beneath the embankment which is approximately 60 feet high. This embankment will effectively act as a dam when the discharge from Allamuchy Pond Dam exceeds the capacity of the pipe beneath the highway.

The analysis contained in Appendix 3 indicates that the routed half-PMF peak discharge is approximately 2670 cfs which will overtop the dam by about 2.8 feet. Overtopping will last for approximately 11 hours assuming the dam does not fail. The minimum elevation of the dam allows a depth of 2.1 feet in the spillway before overtopping occurs. Under this head the spillway capacity is 113 cfs, which is approximately 8 percent of the selected SDF. Thus the spillway is considered inadequate.

The Interstate 80 culvert, located between the potential damage area and the dam reduces the half-PMF peak discharge from 2670 cfs to 1180 cfs.

The stream channel is very steep between the Interstate 80 culvert and through the damage area, and flow exiting the culvert is not further reduced before reaching the damage area. It is estimated that one business would be inundated by approximately 1 foot of water under half-PMF conditions. This structure is located on the bank of the stream and has in the past experienced minor flooding in the spring. Because the flow velocity under half-PMF conditions would be extremely high 1 foot of inundation could cause appreciable property damage. Additionally, because the discharge channel passes through a populated area and the capacity of the channel would be significantly exceeded, the possibility for loss of a few lives exists.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

Two holes on the crest of the dam between the spillway and west abutment indicate that piping may have occurred inside the dam. If not controlled, piping could lead to failure of the dam.

Two major seepages on the east bank of the downstream channel, if not controlled, could lead to piping and failure of the dam.

Trees growing near the downstream toe of the dam could cause serious seepage and erosion problems if a tree blows over and pulls out its roots or if a tree dies or is cut and its roots rot.

The dry-stone-masonry wall which retains the upstream side of the embankment is in poor condition. Further deterioration of this wall could lead to stability and wave-erosion problems on the upstream slope.

Continued spalling and cracking of the spillway apron and training walls could lead to piping and erosion if the water is allowed to pass through the concrete at the cracks and spalled apreas.

Erosion on the west bank of the downstream channel could lead to seepage problems and breaching of the dam.

Based on the visual inspection alone, it is not possible to determine the character of the dam foundation or the interior of the cross section. Therefore, it is not possible to evaluate the factor of safety of the dam against slope failure.

6.2 Design and Construction Data

No design or construction data pertinent to the structural stability of the dam are available.

6.3 Operating Records

No operating records pertinent to the structural stability of the dam are available.

6.4 Post-Construction Changes

No record of post-construction changes pertinent to the structural stability of the dam are available.

6.5 Seismic Stability

This dam is in Seismic Zone 1. According to the Recommended Guidelines, dams located in Seismic Zone 1 "may be assumed to present no hazard from earthquake provided static stability conditions are satisfactory and conventional safety margins exist." None of the visual observations made during the inspection are indicative of unstable slopes. However, because no data are available concerning the engineering properties of the embankment and foundation materials for this dam, it is not possible to make a numerical evaluation of the factor of safety under static conditions.

SECTION 7
ASSESSMENT, RECOMMENDATIONS/REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. Allamuchy Pond Dam is an old dam of undetermined age and is in poor condition.

b. Adequacy of Information. The information available is such that the assessment of this dam must be based solely on the results of the visual inspection. The presence of a dense cover of brush and brambles on much of the embankment makes it impossible to inspect the dam adequately.

c. Urgency. The recommendations made in Section 7.2 should be implemented by the owner as prescribed.

d. Necessity for Additional Data/Evaluation. The information available from the visual inspection is adequate to identify the potential problems which are listed in 7.2 a. below. These problems require the attention of a professional engineer qualified in the design and construction of dams to make additional engineering studies to design or specify remedial measures. If left unattended, problems could lead to instability of the structure. The embankment should be inspected after the trees, brush and brambles are cleared, as recommended below.

7.2 Recommendations/Remedial Measures

a. Recommendations. The owner should retain a professional engineer qualified in the design and construction of dams to accomplish the following in the time frame specified.

Starting very soon:

1. Conduct further detailed hydrologic and hydraulic analyses of the watershed, reservoir, dam, spillway and downstream area to determine the extent and type of mitigating measures required.

2. Specify and oversee and implement procedures for removal of trees and their root masses from the bank and a zone 25 feet wide at the downstream toe of the dam to allow for adequate identification of seepage problems.

3. Inspect the dam after trees, brush and brambles have been cleared from the embankment.

Starting soon, investigate the cause of the holes on the crest of the dam and the seepage on the bank of the downstream channel and design remedial measures, if needed.

Starting in the near future:

1. Design and implement repairs for the dry stone-masonry wall on the upstream slope of the dam.

2. Design and implement repairs for the erosion that has occurred on the west bank of the downstream channel.

In the future:

Restore the low-level gate operating mechanism to an operable condition and provide a downstream outlet to the discharge pipe.

b. Operating and Maintenance Procedures. The owner should do the following immediately:

1. Start a program of regularly checking the overall condition of the dam.

2. Remove the log from the entrance to the spillway.

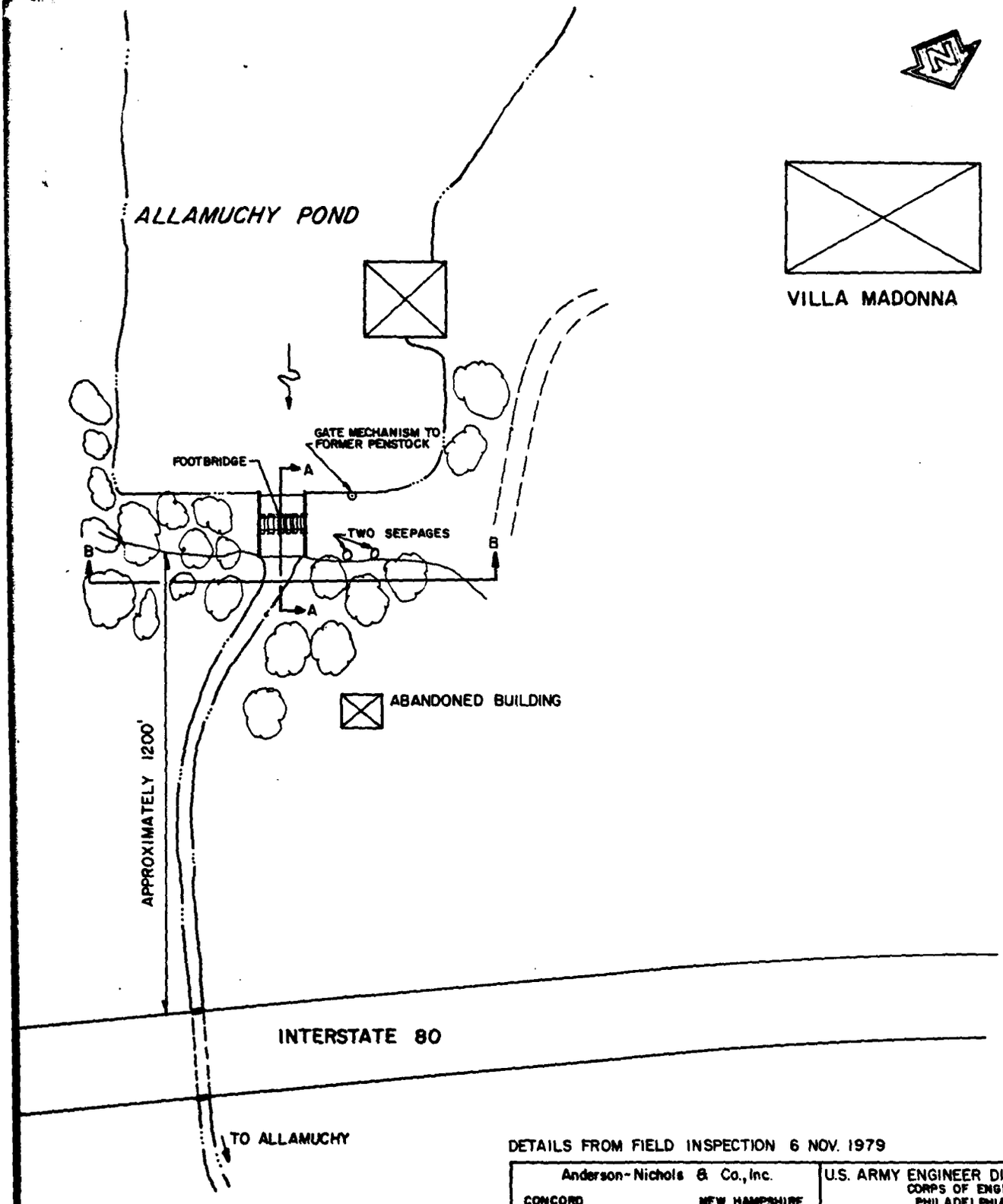
3. Clear debris from the discharge channel downstream of the spillway.

The owner should do the following soon:

1. Clear trees and brush from the discharge channel and on either side of the discharge channel for some distance downstream from the dam, to prevent blockage of the channel by windfalls.

2. Establish a surveillance program for use during and immediately after periods of heavy rainfall, and also a warning program to follow in case of emergency conditions.

Within one year from the date of approval of this report, the owner should develop written operating procedures and a periodic maintenance plan to insure the safety of the dam.



DETAILS FROM FIELD INSPECTION 6 NOV. 1979

Anderson-Nichols & Co., Inc. CONCORD NEW HAMPSHIRE	U.S. ARMY ENGINEER DIST. PHILADELPHIA CORPS OF ENGINEERS PHILADELPHIA, PA.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

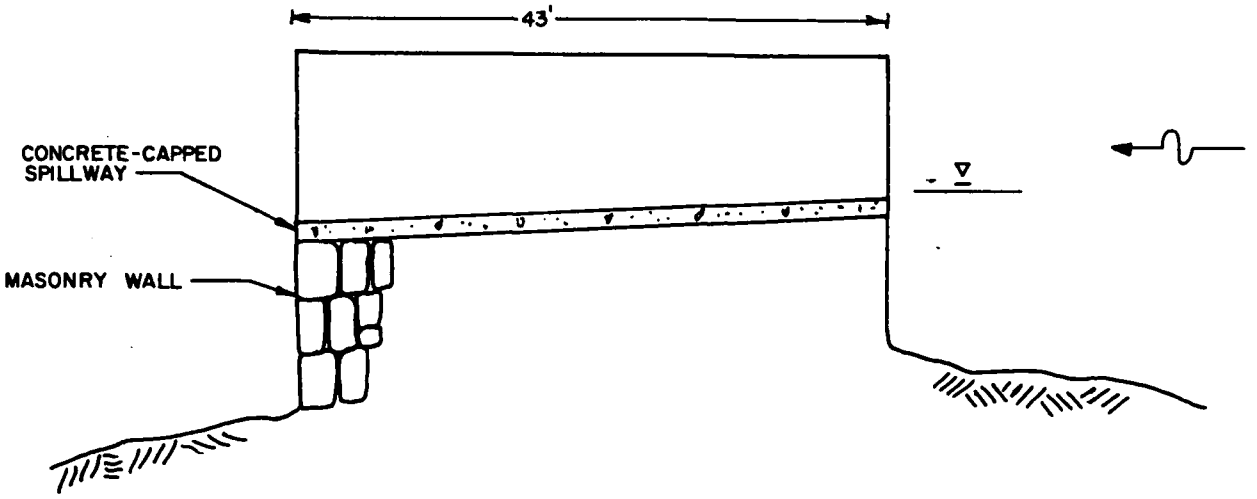
ALLAMUCHY POND DAM

TRIB. TO PEQUEST RIVER NEW JERSEY

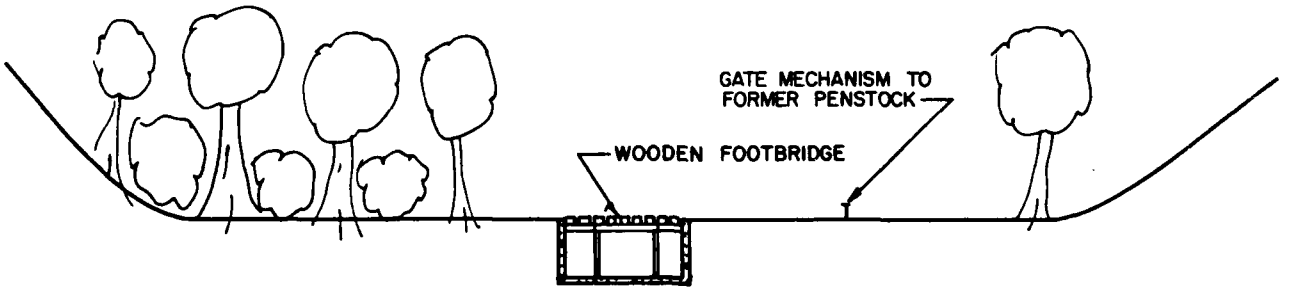
SCALE: NOT TO SCALE

DATE: FEBRUARY 1980

FIGURE 1



SECTION A-A



ELEVATION B-B

DETAILS FROM FIELD INSPECTION 6 NOV. 1979

Anderson-Nichols & Co., Inc. CONCORD NEW HAMPSHIRE	U.S. ARMY ENGINEER DIST. PHILADELPHIA CORPS OF ENGINEERS PHILADELPHIA, PA.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

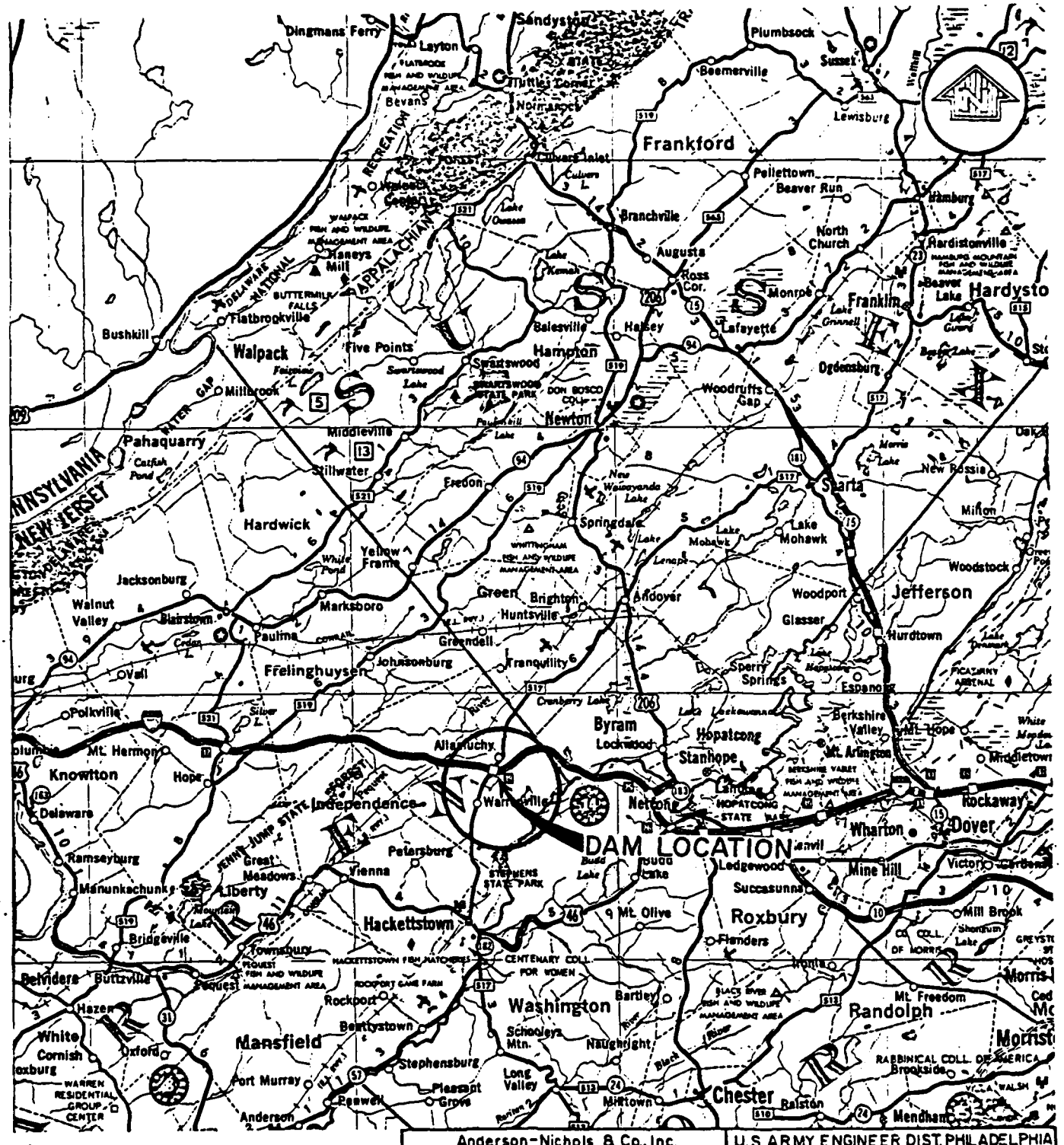
ALLAMUCHY POND DAM

TRIB. TO PEQUEST RIVER NEW JERSEY

SCALE: NOT TO SCALE

DATE: FEBRUARY 1980

FIGURE 2



SCALE IN MILES

0 5 10

MAP BASED ON STATE OF NEW JERSEY OFFICIAL HIGHWAY MAP AND GUIDE.

Anderson-Nichols & Co., Inc. CONCORD NEW HAMPSHIRE	U.S. ARMY ENGINEER DIST. PHILADELPHIA CORPS OF ENGINEERS PHILADELPHIA, PA.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

ALLAMUCHY POND DAM
LOCATION MAP

TRIBUTARY TO PEQUEST RIVER NEW JERSEY

			SCALE: SEE BAR SCALE
			DATE: FEBRUARY 1980

FIGURE 3

APPENDIX 1

CHECK LIST VISUAL INSPECTION

ALLAMUCHY POND DAM

Check List
Visual Inspection
Phase 1

Name Dam Allamuchy Pond Dam County Warren State New Jersey Coordinators NJDEP

Date(s) Inspection Nov. 5, 1979 Weather sunny, cool Temperature 48° F

Pool Elevation at Time of Inspection 795.0 NGVD Tailwater at Time of Inspection 784.5 NGVD

Inspection Personnel:

Warren Guinan

Stephen Gilman

Kenneth Stuart

Ronald Hirschfeld

Hirschfeld/Gilman Recorder

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	None observed. Dry stone masonry walls comprise upstream and downstream sides of embankment.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	Two small holes less than one foot deep on crest of dam between spillway and west abutment. Horizontal alignment is good.	Engage engineer to study origin of holes and design remedial measures.
RIPRAP FAILURES		

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
RAILINGS		
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Considerable erosion of west bank of downstream channel immediately downstream of spillway.	Repair eroded area.
ANY NOTICEABLE SEEPAGE	Two major seepages at edge of ravine on west bank of discharge channel immediately downstream of spillway. No evidence to indicate whether these seepages are associated with the gate operator on upstream side of the dam between the spillway and west abutment.	Engage engineer to study source leakage and design remedial measures.
STAFF GAGE AND RECORDER	None observed.	
DRAINS	None observed.	
MASONRY FACE (UPSTREAM)	The upstream face is in poor condition. Brush covered.	Clear brush along upstream face. Restore or rebuild upstream face on east side of spillway.
(DOWNSTREAM)	Evidence of debris and badly raveled face west of spillway. East side of spillway is in fair condition. No indication of significant movement.	Restore or rebuild downstream face on west side of spillway.

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Abutments: Cracked and deteriorated, several areas of spalling 2" deep. Apron: Weathered concrete with several visible cracks.	Repair cracked and deteriorated concrete on abutments and apron.
APPROACH CHANNEL	Wide and unobstructed.	
DISCHARGE CHANNEL	Logs, trees and cut brush in channel. Trees overhanging channel.	Clear debris from channel. Cut trees and brush 25 feet on either side of channel for a distance of 100 feet downstream from dam to prevent windfalls from blocking channel.
BRIDGE AND PIERS OVER SPILLWAY	Wooden bridge is badly deteriorated with loose planking. The bridge has no railings.	Restore and rebuild bridge stringers and decking.

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Not visible.	
INTAKE STRUCTURE	Concrete headwall on upstream side has surface erosion and top concrete slab appears to have moved.	Repair surface erosion.
OUTLET PIPE	Not visible.	
OUTLET CHANNEL	Two possible outlet channels downstream of gate operator exist.	Establish and clear outlet channel of gate operator.
FORMER PENSTOCK GATE	Gate operating mechanism is in fair condition. No lubrication or indication of recent operation.	Engage engineer to determine if this former penstock gate mechanism can be incorporated into a low-level outlet.

INSTRUMENTATION

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

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Gently to steeply sloping. Mostly wooded. Some open field.	
SEDIMENTATION	No evidence of significant sedimentation.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Logs, trees and brush in channel. Trees are overhanging the channel.	Clear trees and brush from downstream channel for a distance of 25 feet on either side of the channel for a distance fo 100 feet downstream of dam crest.
SLOPES		
APPROXIMATE NO. OF HOMES AND POPULATION	Two homes and one commercial property (a service garage). Affected population is approximately six persons.	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Plans for this report were developed from visual inspection 5, November, 1979
REGIONAL VICINITY MAP	Prepared for this report.
CONSTRUCTION HISTORY	None disclosed
TYPICAL SECTIONS OF DAM	Prepared for this report from visual inspection 5 November 1979
HYDROLOGIC/HYDRAULIC DATA	No original data was disclosed
OUTLETS - PLAN	Prepared for this report from visual inspection 5 November 1979
- DETAILS	
- CONSTRAINTS	None disclosed
- DISCHARGE RATINGS	
RAINFALL/RESERVOIR RECORDS	None disclosed

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

ITEM	REMARKS
MONITORING SERVICES	Unknown
MODIFICATIONS	None disclosed
HIGH POOL RECORDS	None disclosed
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None disclosed
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None disclosed
MAINTENANCE OPERATION RECORDS	None disclosed

ITEM	REMARKS
SPILLWAY PLAN	
SECTIONS	Plans and sections for this report were developed from visual inspection 5. November. 1979
DETAILS	
OPERATING EQUIPMENT	None
PLANS & DETAILS	Plans and sections for this report were developed from visual inspection 5, November 1979

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 1.6 square miles, moderately to steeply sloping

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 795.0 NGVD (280 acre-feet)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 797.1 NGVD (407 acre-feet)

ELEVATION MAXIMUM DESIGN POOL: 799.9 NGVD (½ PMF)

ELEVATION TOP DAM: 797.1 NGVD

CREST: broad crested free overflow

a. Elevation 795.0 NGVD

b. Type concrete capped masonry

c. Width 43 feet

d. Length 14 feet

e. Location Spillover 100 feet from the west abutment

f. Number and Type of Gates none

OUTLET WORKS: former water power gate

a. Type 4' x 8' intake

b. Location 70 feet from west abutment

c. Entrance Inverts unknown

d. Exit Inverts unknown

e. Emergency Draindown Facilities not visible

HYDROMETEORLOGICAL GAGES: none

a. Type

b. Location

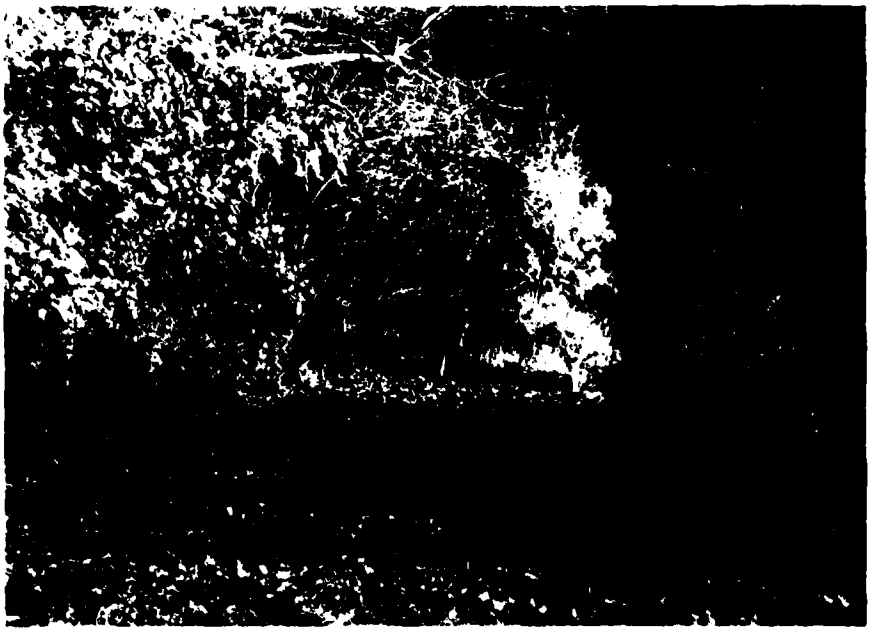
c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 113 cfs

APPENDIX 2

PHOTOGRAPHS

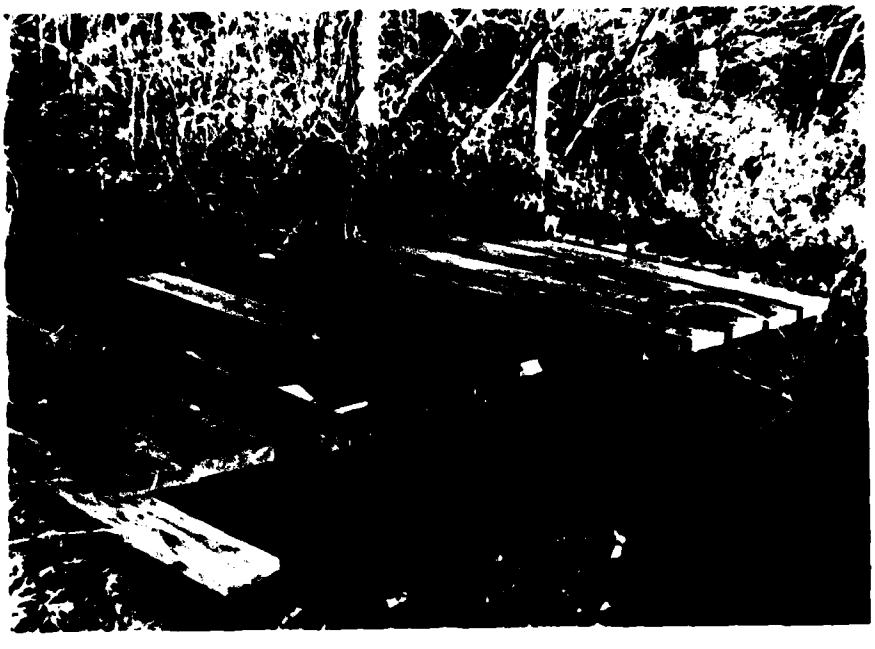
ALLAMUCHY POND DAM



5 NOVEMBER 1979
VIEW FROM WEST ABUTMENT LOOKING ALONG DAM CREST TO SPILLWAY AND EAST ABUTMENT. NOTE BRUSH AND BRAMBLES FROM SPILLWAY TO EAST ABUTMENT.

5 NOVEMBER 1979
VIEW FROM JUST UPSTREAM OF EAST ABUTMENT LOOKING ALONG THE UPSTREAM FACE OF THE DAM

5 NOVEMBER 1979
FROM WEST EDGE OF SPILLWAY LOOKING AT SPILLWAY CREST. NOTE LOG ACROSS THE SPILLWAY.



5 NOVEMBER 1979
VIEW FROM WEST EDGE OF SPILLWAY LOOKING ACROSS WOODEN FOOT-BRIDGE, IT IS IN DISREPAIR.

5 NOVEMBER 1979
FROM WEST EDGE OF SPILLWAY DISCHARGE CHANNEL LOOKING UPSTREAM. NOTE HEAVY GROWTH ON DOWNSTREAM FACE AND LARGE CONCRETE RUBBLE.

5 NOVEMBER 1979
FROM WEST EDGE OF SPILLWAY DISCHARGE CHANNEL LOOKING AT THE DOWNSTREAM FACE OF DAM AND SPILLWAY.

5 NOVEMBER 1979
MAJOR SEEPAGE AT DOWNSTREAM TOE OF DAM APPROXIMATELY 70 FEET FROM WEST ABUTMENT.

5 NOVEMBER 1979
GATE MECHANISM FOR FORMER PENSTOCK. PENSTOCK SECTIONS LIE IN RUSTED UNCONNECTED SECTIONS DOWNSTREAM.

5 NOVEMBER 1979
FROM SPILLWAY CREST LOOKING UPSTREAM AT ALLAMUCHY POND.

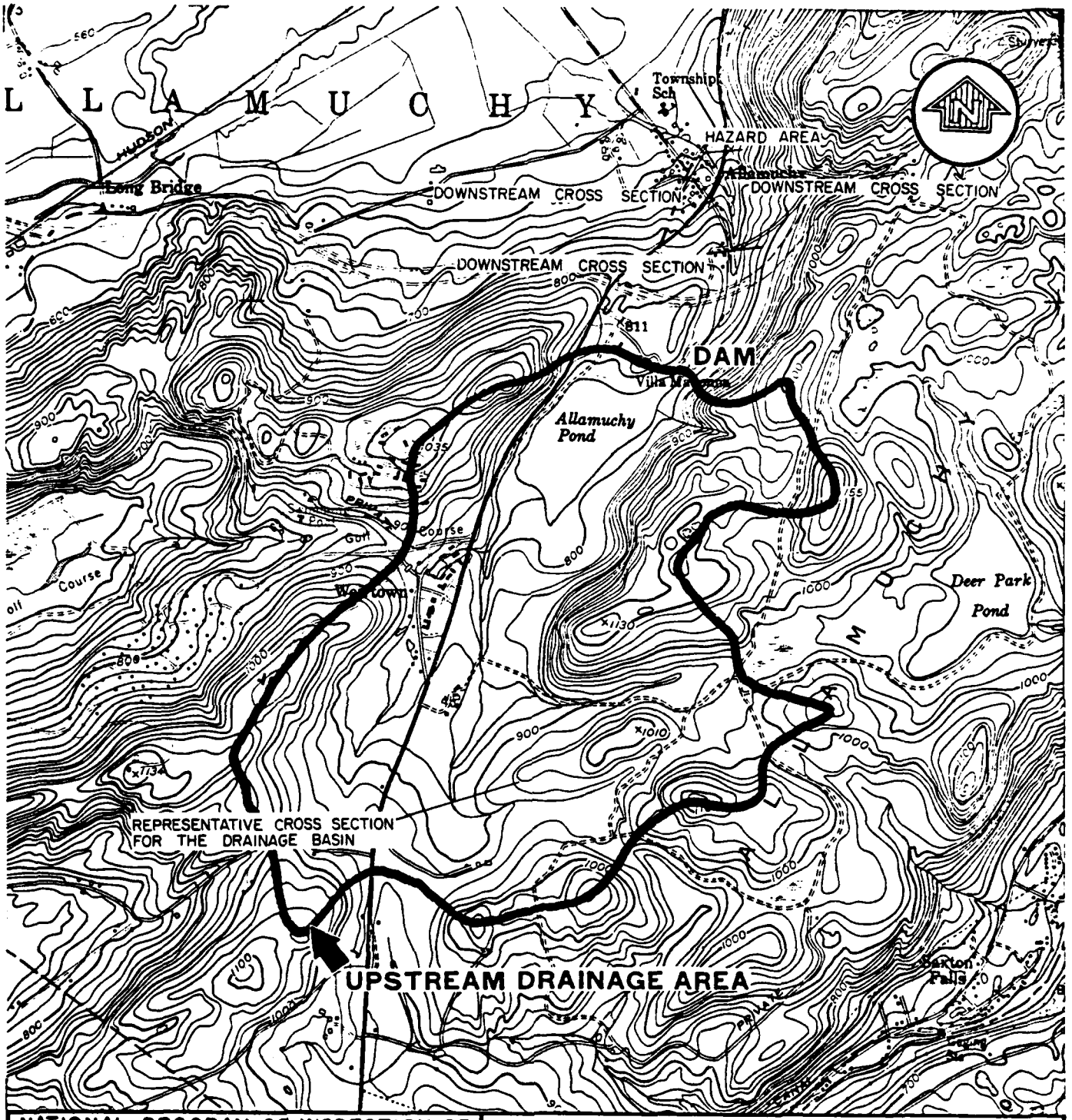
5 NOVEMBER 1979
VIEW FROM EAST SIDE OF SPILLWAY LOOKING DOWNSTREAM.

5 NOVEMBER 1979
VIEW OF ENTRANCE TO INTERSTATE 80 CULVERT LOCATED 1200 FEET DOWNSTREAM OF ALLAMUCHY POND DAM.

APPENDIX 3

HYDROLOGIC COMPUTATIONS

ALLAMUCHY POND DAM



NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

ALLAMUCHY POND DAM

ALLAMUCHY TOWNSHIP, NEW JERSEY

REGIONAL VICINITY MAP

FEBRUARY 1980

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
PHILADELPHIA, PENNSYLVANIA

ANDERSON-NICHOLS & CO., INC. CONCORD, N.H.

SCALE IN MILES

0 1/2 1

MAP BASED ON U.S.G.S. 7.5 MINUTE QUADRANGLE SHEET. TRANQUILITY, N.J. 1954. REVISED 1971.

SQUARES 1/4 IN. SCALE

HYDROLOGIC COMPUTATIONS

NAME: ALLAMUCHY POND DAM

LOCATION: WARREN COUNTY, NEW JERSEY

DRAINAGE AREA: 1.6 SQUARE MILES

SURFACE AREA: 51.4 ACRES

EVALUATION CRITERIA: SIZE: SMALL

HAZARD: SIGNIFICANT

SPILLWAY DESIGN FLOOD: BASED ON SIZE AND HAZARD CLASSIFICATION THE SPILLWAY DESIGN FLOOD WILL BE THE 1/2 PMF (PROBABLE MAXIMUM FLOOD) WITH A PEAK INFLOW OF 3619 CFS.

SQUARES 1/4 IN. SCALE

TIME OF CONCENTRATION

ALLAMUCHY POND DAM BASIN

OVERLAND FLOW LENGTH = 1700 FT.

ELEVATION DIFFERENCE FROM WATERSHED DIVIDE TO THE STREAM THREAD = 182 FT.

SLOPE FOR OVERLAND FLOW = 10.7%

ALSO

STREAMFLOW LENGTH FROM END OF OVERLAND FLOW TO THE INLET = 7700 FT.

ELEVATION DIFFERENCE FROM END OF OVERLAND FLOW TO THE INLET = 143 FT.

SLOPE FOR STREAMFLOW = 1.9%

ALSO

THE REPRESENTATIVE CROSS SECTION FOR THE BASIN WAS DRAWN TO DETERMINE AN APPROXIMATE VELOCITY AT A WATER DEPTH OF 6 FT.

SQUARES 1/4 IN. SCALE

TIME OF CONCENTRATION (CONT.)

REPRESENTATIVE SECTION (CONT.)

AREA OF CROSS SECTION = 68 SQ. FT.

WETTED PERIMETER = 25.8 FT.

HYDRAULIC RADIUS = 2.64 FT

CHANNEL "n" = 0.08

OVERBANK "n" = 0.08

$$V = \frac{1.49}{n} (R)^{2/3} (S)^{1/2}$$

$V = 4.85$ fps

THE TIME OF CONCENTRATION FOR STREAMFLOW OF STREAM INTO ALLAMUCHY POND $= \frac{7700}{4.85(60)} = 26.4$ MINUTES

SQUARES 1/4 IN SCALE 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

TIME OF CONCENTRATION (CONT.)

FOUR METHODS FOR DETERMING T_c ARE AVERAGED

WESTON

$L_o = 1700$

$S_o = 10.7\%$

$V = .86$ fps

$\frac{1700}{.86(60)} = 33.0$ FOR T_c OVERLAND + 26.4 MIN. = 59 MIN $\approx$ 1.0 HR.

$T_c = 1.0$ HR.

KERBY

$$T_c = 0.83\left(\frac{NL}{\sqrt{S}}\right)^{0.467}$$

$$T_c = 0.83\left(\frac{.6\,(1700)}{\sqrt{.107}}\right)^{.467} = 35.6 \text{ MIN. FOR OVERLAND} + 26.4 \text{ MIN} = 62 \text{ MIN} \approx 1.0 \text{ HR.}$$

$T_c = 1.0$ HR.

SQUARES 1/4 IN. SCALE

TIME OF CONCENTRATION (CONT.)

DESIGN OF SMALL DAMS

CHANNEL VELOCITY FOR OVERLAND FLOW = 3 fps

CHANNEL VELOCITY FOR STREAMFLOW = 2 fps

LENGTH OVERLAND: 1700 FT.

LENGTH STREAMFLOW: 7700 FT.

$T_c = \frac{7700}{2} + \frac{1700}{3} = 4417$ SEC = 74 MIN = 1.2 HRS.

T_c = 1.2 HRS.

SOIL & WATER CONSERVATION

$T_L = \frac{L^{0.8}(D+1)}{9000\ Y^{.5}}$ WHERE $D = \frac{1000}{N} - 10$, $N = 70$ AND

$Y = 3.5\%$

$T_L = \frac{9400^{.8}(4.28)^{1.67}}{9000\ (3.5)^{.5}} = 1.02$ HR.

$T_c = 1.67(T_L) = 1.7$ HRS.

AVERAGE T_c FOR ALLAMUCHY POND BASIN = 1.23 HRS.

AVERAGE T_L FOR ALLAMUCHY POND BASIN = 0.74 HRS.

Anderson-Nichols & Company, Inc.

JOB NO. 3409-16

Subject H2H

ALLAMUCHY POND DAM.

Sheet No. 10 of 15

Date 2/80

Computed H.H

Checked FLP

SQUARES 1/4 IN SCALE 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

STORAGE - ELEVATION DETERMINATION

ELEVATION FEET	Δ HEAD FEET	AREA ACRES	AVG. AREA ACRES	Δ STORAGE ACRE-FEET	STORAGE ACRE-FT.
784.1		0			0
	10.9		25.7	280	
795.0		51.4			280
	1.0		55.5	56	
796.0		59.5			336
	1.0		63.5	64	
797.0		67.5			400
	0.1		68.0	7	
797.1		68.4			407
	0.9		72.1	65	
798.0		75.7			472
	1.0		79.7	80	
799.0		83.7			552
	1.0		87.8	88	
800.0		91.8			640

SQUARES 1/4 IN. SCALE

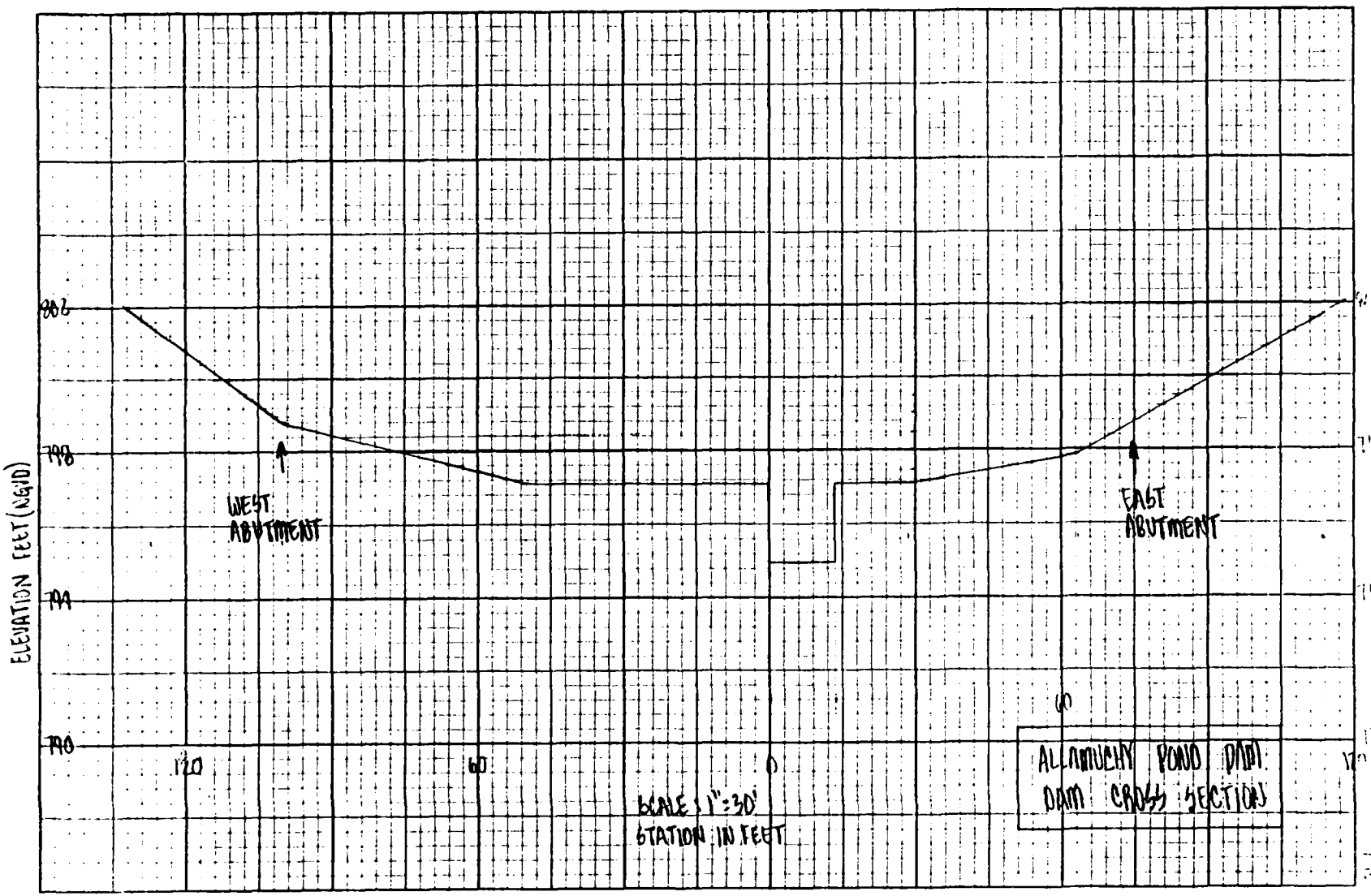
SPILLWAY CAPACITY

ALLAMUCHY POND DAM HAS ONE UNGATED SPILLWAY. THE SPILLWAY CAPACITY AND FLOW OVER THE DAM WERE DETERMINED USING THE WEIR EQUATION ($Q = CLH^{3/2}$). C VALUES WERE TAKING FROM "HANDBOOK OF HYDRAULICS" KING & BRATER

ELEVATION NGVD	SPILLWAY H	SPILLWAY C	SPILLWAY Q	OVER DAM H	OVER DAM C	OVER DAM L	OVER DAM L_1	OVER DAM Q	TOTAL Q
795.0	0	2.65	0						0
795.5	0.5		13						13
796.0	1.0		38						38
796.5	1.5		68						68
797.0	2.0		105						105
797.1	2.1		113	0	2.60	0	0	0	113
797.5	2.5		147	0.4		102	90	59	206
798.0	3.0		193	0.9		140	125	278	471
798.5	3.5		243	1.4		160	135	581	824
799.0	4.0		297	1.9		180	160	1090	1387
799.5	4.5		354	2.4		190	180	1740	2094
800.0	5.0		415	2.9		203	190	2440	2855
802.0	7.0		687	4.9		250	230	6486	7173

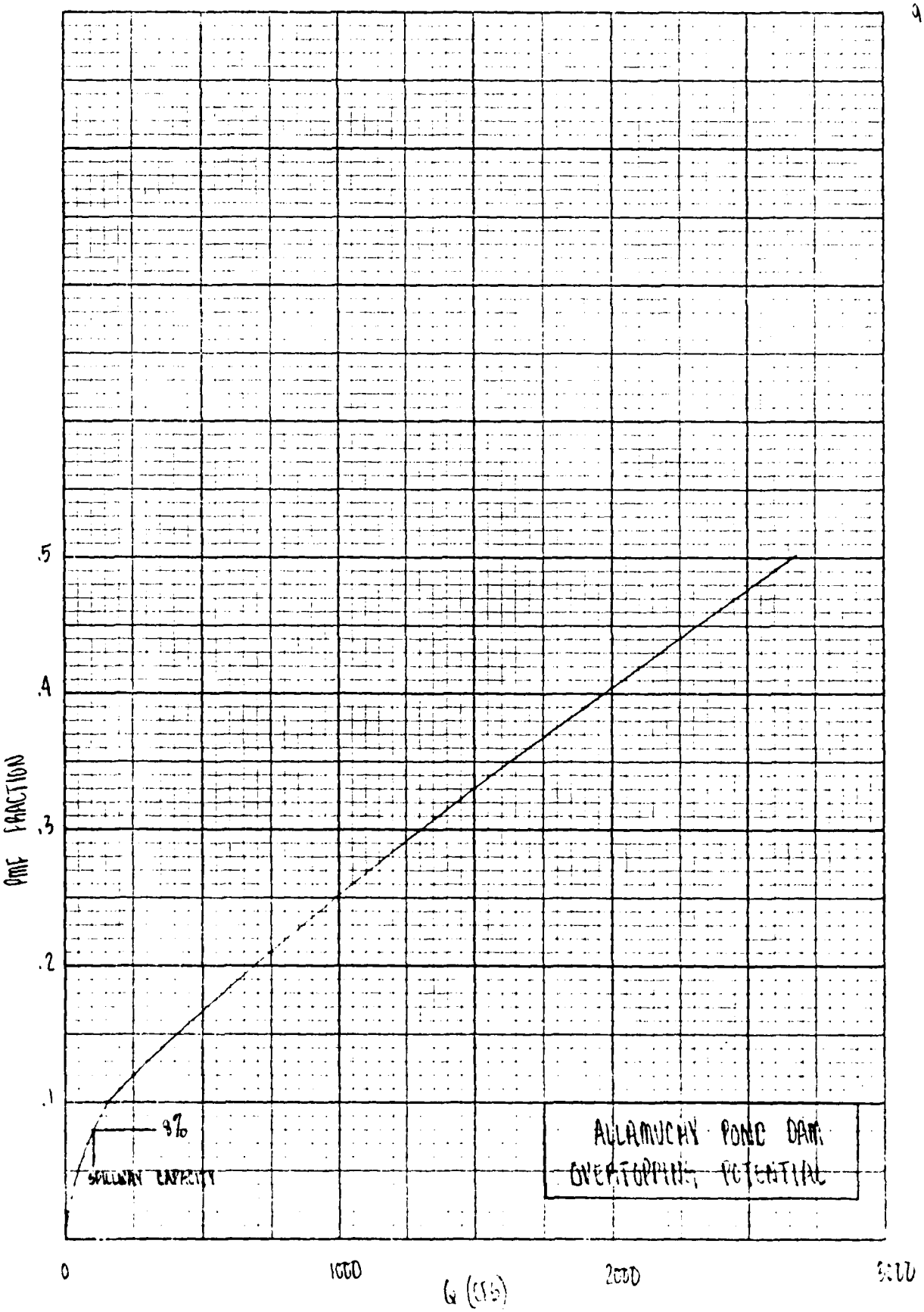
SPILLWAY LENGTH = 14 FEET

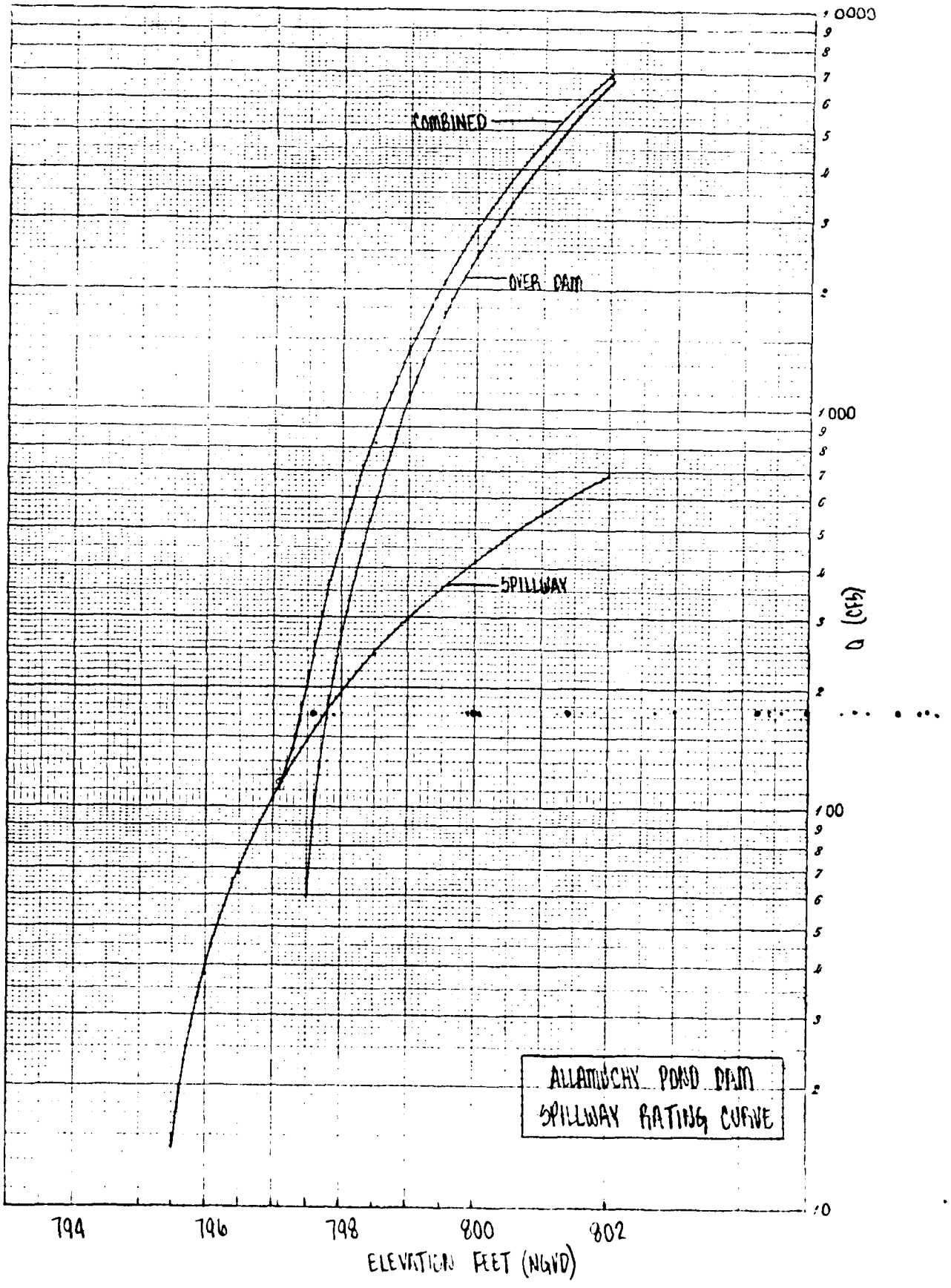
LENGTH OF WEIR FOR FLOW OVER DAM : L = ACTUAL LENGTH &
L_1 = ADJUSTED LENGTH FOR UNEVEN WEIR



DATE: 2/90
BY: KVS

DATE: 2/80
BY: [illegible]





STORAGE ELEVATION DETERMINATION I80 CULVERT

ELEVATION FEET	Δ HEAD FEET	AREA ACRES	AVG. AREA ACRES	Δ STORAGE ACRE-FEET	STORAGE ACRE-FT.
735.0		0			0
	4		3.5	14	
739.0		7.0			14
	2		7.3	15	
741.0		7.5			29
	2		7.9	16	
743.0		8.3			45
	2		8.7	17	
745.0		9.1			62
	2		9.6	19	
747.0		10.0			71
	2		10.6	21	
749.0		11.1			92
	2		11.8	24	
751.0		12.4			116
	2		13.1	26	
753.0		13.8			152
	2		14.5	29	
755.0		15.1			181
	2		16.4	33	
757.0		17.6			214
	2		17.8	36	
759.0		18.0			250
	2		19.0	38	
761.0		20.0			288
	2		21.0	42	
763.0		22.0			330
	2		23.2	46	
765.0		24.3			376
	15		47.2	94	
780.0		70.0			470

Anderson-Nichols & Company, Inc.

Subject H&H

Sheet No. 12 of 15

Date 2/80

Computed KJL

Checked FJO

JOB NO. 3409-16

ALAMUCHY POND DAM

SQUARES 1/4 IN. SCALE

RATING CURVE FOR I-80 CULVERT DOWNSTREAM OF DAM

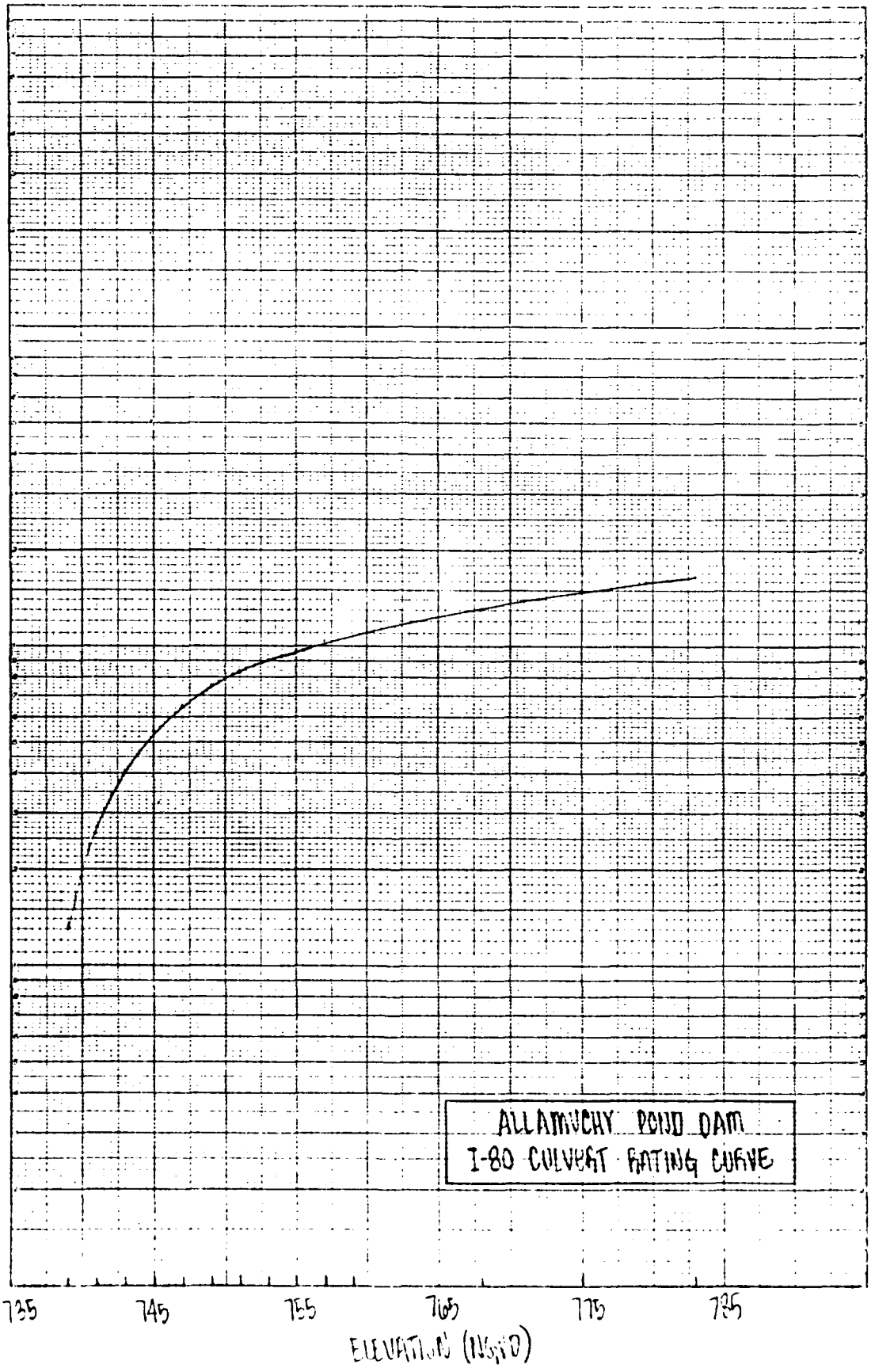
SIZE: 8'4" X 7'6" CLOSE TO CIRCULAR USE 96" DIAMETER

SLOPE: STEEP - INLET CONTROL MAY BE ASSUMED

INLET: HEADWALL

FROM HEC-5 CHARTS, CHART 5 P. 5-25 USE SCALE (1)

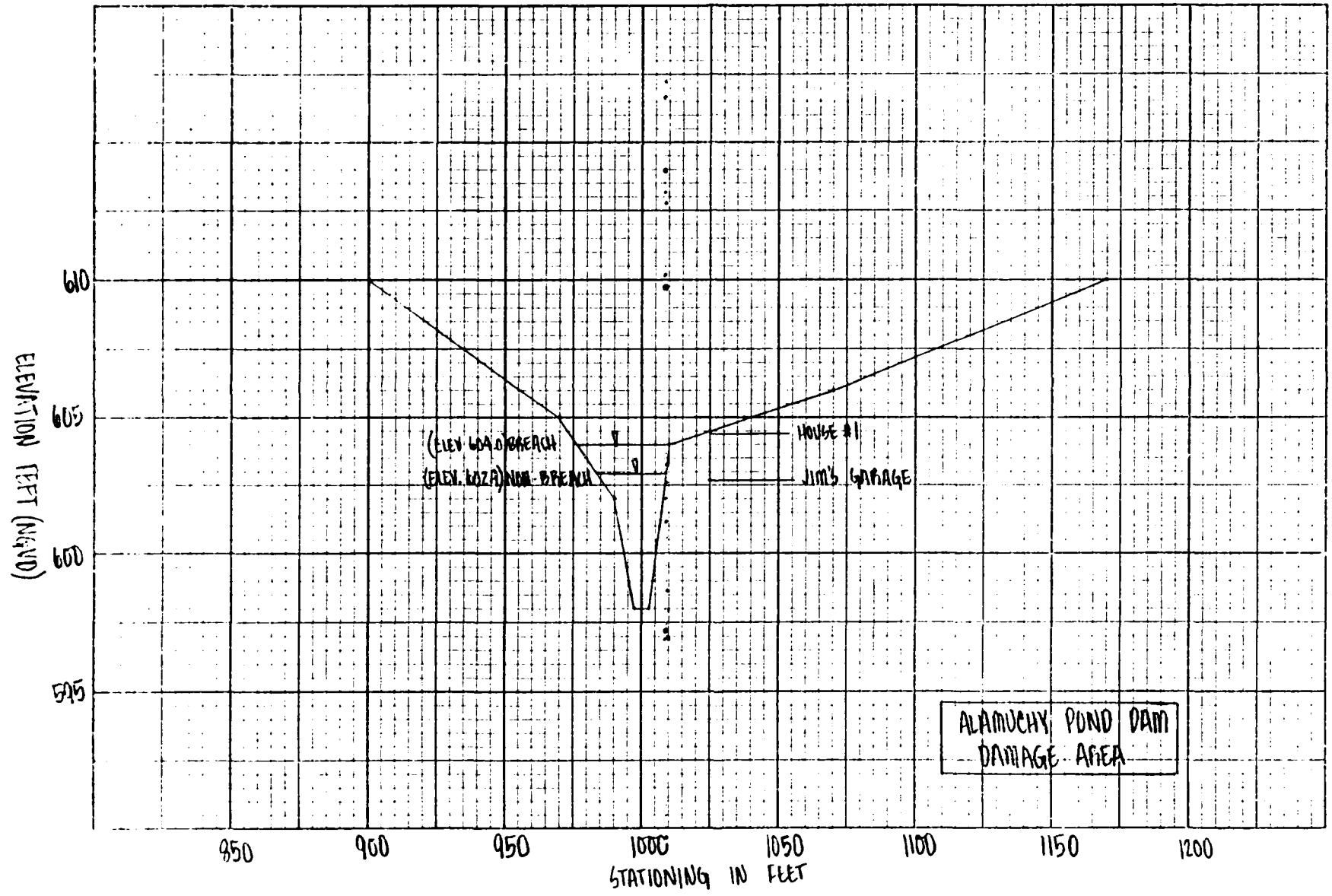
HW FEET	HW/D	Q CFS	ELEVATION FEET
4	.50	130	739
6	.75	260	741
8	1.00	400	743
10	1.25	550	745
12	1.50	650	747
14	1.75	750	749
16	2.00	830	751
18	2.25	900	753
20	2.50	970	755
22	2.75	1030	757
24	3.00	1100	759
32	4.00	1300	767
40	5.00	1500	775
48	6.00	1650	783
50	7.00	1700	785
60	7.50	2000	795



SQUARES 1/4 IN. SCALE

POTENTIAL DOWNSTREAM HAZARD AREA

THREE CROSS SECTIONS WERE DRAWN ON USGS MAPS TO MODEL THE POTENTIAL HAZARD AREA IN THE VILLAGE OF ALLAMUCHY. THE FIRST SECTION IS ABOUT 1900' DOWNSTREAM OF THE DAM, THE SECOND SECTION IS ABOUT 2600' DOWNSTREAM OF THE DAM AND THE THIRD SECTION IS ABOUT 3800' DOWNSTREAM OF THE DAM (THIS SECTION IS IN THE VILLAGE OF ALLAMUCHY, THE POTENTIAL HAZARD AREA). THE SECTIONS ARE NECESSARY TO ACCURATELY DETERMINE DEPTHS OF INUNDATION AT THE POTENTIAL DAMAGE AREA.



DATE: 2/80
15 OF 15

HEC-1 OUTPUT

OVERTOPPING AND BREACH ANALYSIS

ALLAMUCHY POND DAM

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********
    1              A1 ALLAMUCHY POND DAM OVERTOPPING AND BREACH ANALYSIS•P.STUART•ANDERSON-NICHOLS•
    2              A2 FED ID NO.NJ00501
    3              A3 0.1•0.25 AND 0.5 MULTIPLES OF THE PMF FROM THE 22.5 INCH PMP
    4              B    170       0      10       0       0       0       0       0       0       0
    5              B1     5
    6              J      2       3       1
    7              J1    .1     .25      .5
    8              K      0      A1                                      1
    9              K1 ALLAMUCHY POND INFLOW HYDROGRAPH
   10              M      1       2     1.6                      .8                      1
   11              P             22.5     113     123     132
   12              T                                              1      .1
   13              W2            .74
   14              Y     -3
   15              K      1      A2                                      1
   16              K1 ROUTE HYDROGRAPH THROUGH ALLAMUCHY POND
   17              Y                              1       1
   18              Y1     1                                      336      -1
   19              Y4 795.0   795.5   796.0   796.5   797.0   797.1   797.5   798.0   798.5   799.0
   20              Y4 799.5   800.0   802.0
   21              Y5    0.     13.     38.     68.    105.    113.    206.    471.    824.   1387.
   22              Y5 2094.   2855.   7137.
   23              $S    0.    280.    336.    400.    407.    472.    552.    640.
   24              $E 784.1   795.0   796.0   797.0   797.1   798.0   799.0   800.0
   25              $$ 795.0
   26              $D 797.1
   27              $B   40.      1   784.1       1   795.0   797.1
   28              $B   60.     .5   784.1       1   795.0   830.0
   29              K      1      A3                                      1
   30              K1 ROUTE HYDROGRAPH THROUGH I-80 ROAD EMBANKMENT
   31              Y                              1       1
   32              Y1     1                                       -1      -1
   33              Y4  735.    739.    741.    743.    745.    747.    749.    751.    753.    755.
   34              Y4  757.    759.    761.    775.    783.    785.    795.
   35              Y5    0.    130.    260.    400.    550.    650.    750.    830.    900.    970.
   36              Y5 1030.   1100.   1300.   1500.   1650.   1700.   2000.
   37              $S    0.     14.     29.     45.     62.     71.     92.    116.    152.    181.
   38              $S  214.    250.    288.    330.    376.    470.
   39              $E  735.    739.    741.    743.    745.    747.    749.    751.    753.    755.
   40              $E  757.    759.    761.    763.    765.    780.
   41              $$  735.
   42              $D  795.
   43              K      1      A4                                      1
   44              K1 ROUTE FLOW FROM CULVERT OUTLET 400 FEET DOWNSTREAM
   45              Y                              1       1
   46              Y1     1                                       -1
   47              Y6    .1     .04      .1    690.    720.    400.    .068
   48              Y7  910.    720.    960.    710.    985.    702.    995.    698.   1005.    690.
   49              Y7 1015.    702.   1030.    710.   1100.    720.
   50              K      1      A5                                      1
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K1 ROUTE FLOW 1000FEET FURTHERDOWNSTREAM
Y                                   1       1
Y1      1
Y6     .1      .04      .1     633.    647.   1000.    -1
                                                .065
Y7   880.     647.     950.    640.    980.    635.    995.    633.    1005.    633.
Y7  1020.     635.    1100.    640.   1210.    647.
K       1       A6                                      1
K1 ROUTE FLOW TO DAMAGE CENTER, ANOTHER 450 FEET DOWNSTREAM
Y                                   1       1
Y1      1
Y6     .1      .04      .1     598.    610.    450.    -1
                                                .070
Y7   900.     610.     970.    605.    990.   602.0    998.    598.    1002.    598.
Y7  1010.     604.    1070.    606.   1170.    610.
K      99
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PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	A1
ROUTE HYDROGRAPH TO	A2
ROUTE HYDROGRAPH TO	A3
ROUTE HYDROGRAPH TO	A4
ROUTE HYDROGRAPH TO	A5
ROUTE HYDROGRAPH TO	A6
END OF NETWORK	

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

RUN DATE= 80/03/27.
TIME= 06.48.34.

ALLAMUCHY POND DAM OVERTOPPING AND BREACH ANALYSIS*K.STUART*ANDERSON-NICHOLS*
FED ID NO.NJ00501
0.1,0.25 AND 0.5 MULTIPLES OF THE PMF FROM THE 22.5 INCH PMP

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
170	0	1.	0	0	0	0	0	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 2 NRTIO= 3 LRTIO= 1

RTIOS= .10 .25 .50

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

ALLAMUCHY POND INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	1.60	0.00	1.60	.80	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.50	113.00	123.00	132.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	FRAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.10	0.00	0.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= .74

RECESSION DATA
STRTQ= -3.00 QRCSN= 0.00 RTIOR= 1.00

UNIT HYDROGRAPH 24 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .74 VOL= 1.00

96.	298.	631.	879.	938.	864.	717.	508.	354.	255.
187.	133.	96.	69.	49.	36.	26.	18.	13.	10.
8.	5.	3.	1.						

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.10	1	.02	0.00	.02	5.	1.01	14.20	86	.51	.49	.02	2326.
1.01	.20	2	.02	0.00	.02	5.	1.01	14.30	87	.51	.49	.02	2429.
1.01	.30	3	.02	0.00	.02	5.	1.01	14.40	88	.51	.49	.02	2545.
1.01	.40	4	.02	0.00	.02	5.	1.01	14.50	89	.51	.49	.02	2661.
1.01	.50	5	.02	0.00	.02	5.	1.01	15.00	90	.51	.49	.02	2763.
1.01	1.00	6	.02	0.00	.02	5.	1.01	15.10	91	.46	.45	.02	2842.
1.01	1.10	7	.02	0.00	.02	5.	1.01	15.20	92	.77	.76	.02	2917.
1.01	1.20	8	.02	0.00	.02	5.	1.01	15.30	93	1.39	1.37	.02	3002.
1.01	1.30	9	.02	0.00	.02	5.	1.01	15.40	94	3.48	3.46	.02	3653.
1.01	1.40	10	.02	0.00	.02	5.	1.01	15.50	95	1.00	.99	.02	4680.
1.01	1.50	11	.02	0.00	.02	5.	1.01	16.00	96	.62	.60	.02	6031.
1.01	2.00	12	.02	0.00	.02	5.	1.01	16.10	97	.47	.46	.02	7001.
1.01	2.10	13	.02	0.00	.02	5.	1.01	16.20	98	.47	.46	.02	7239.
1.01	2.20	14	.02	0.00	.02	5.	1.01	16.30	99	.47	.46	.02	6881.
1.01	2.30	15	.02	0.00	.02	5.	1.01	16.40	100	.47	.46	.02	6167.
1.01	2.40	16	.02	0.00	.02	5.	1.01	16.50	101	.47	.46	.02	5277.
1.01	2.50	17	.02	0.00	.02	5.	1.01	17.00	102	.47	.46	.02	4570.
1.01	3.00	18	.02	0.00	.02	5.	1.01	17.10	103	.37	.36	.02	4071.
1.01	3.10	19	.02	0.00	.02	5.	1.01	17.20	104	.37	.36	.02	3701.
1.01	3.20	20	.02	0.00	.02	5.	1.01	17.30	105	.37	.36	.02	3381.
1.01	3.30	21	.02	0.00	.02	5.	1.01	17.40	106	.37	.36	.02	3112.
1.01	3.40	22	.02	0.00	.02	5.	1.01	17.50	107	.37	.36	.02	2885.
1.01	3.50	23	.02	0.00	.02	5.	1.01	18.00	108	.37	.36	.02	2703.
1.01	4.00	24	.02	0.00	.02	5.	1.01	18.10	109	.03	.01	.02	2530.
1.01	4.10	25	.02	0.00	.02	5.	1.01	18.20	110	.03	.01	.02	2327.
1.01	4.20	26	.02	0.00	.02	5.	1.01	18.30	111	.03	.01	.02	2038.
1.01	4.30	27	.02	0.00	.02	5.	1.01	18.40	112	.03	.01	.02	1683.
1.01	4.40	28	.02	0.00	.02	5.	1.01	18.50	113	.03	.01	.02	1322.
1.01	4.50	29	.02	0.00	.02	5.	1.01	19.00	114	.03	.01	.02	998.
1.01	5.00	30	.02	0.00	.02	5.	1.01	19.10	115	.03	.01	.02	730.
1.01	5.10	31	.02	0.00	.02	5.	1.01	19.20	116	.03	.01	.02	537.
1.01	5.20	32	.02	0.00	.02	5.	1.01	19.30	117	.03	.01	.02	402.
1.01	5.30	33	.02	0.00	.02	5.	1.01	19.40	118	.03	.01	.02	305.
1.01	5.40	34	.02	0.00	.02	5.	1.01	19.50	119	.03	.01	.02	236.
1.01	5.50	35	.02	0.00	.02	5.	1.01	20.00	120	.03	.01	.02	188.
1.01	6.00	36	.02	0.00	.02	5.	1.01	20.10	121	.03	.01	.02	154.
1.01	6.10	37	.05	0.00	.05	5.	1.01	20.20	122	.03	.01	.02	129.
1.01	6.20	38	.05	0.00	.05	5.	1.01	20.30	123	.03	.01	.02	111.
1.01	6.30	39	.05	0.00	.05	5.	1.01	20.40	124	.03	.01	.02	98.
1.01	6.40	40	.05	0.00	.05	5.	1.01	20.50	125	.03	.01	.02	89.
1.01	6.50	41	.05	0.00	.05	5.	1.01	21.00	126	.03	.01	.02	83.
1.01	7.00	42	.05	0.00	.05	5.	1.01	21.10	127	.03	.01	.02	78.
1.01	7.10	43	.05	0.00	.05	5.	1.01	21.20	128	.03	.01	.02	75.
1.01	7.20	44	.05	.03	.02	8.	1.01	21.30	129	.03	.01	.02	72.
1.01	7.30	45	.05	.03	.02	18.	1.01	21.40	130	.03	.01	.02	70.
1.01	7.40	46	.05	.03	.02	38.	1.01	21.50	131	.03	.01	.02	69.
1.01	7.50	47	.05	.03	.02	67.	1.01	22.00	132	.03	.01	.02	69.
1.01	8.00	48	.05	.03	.02	98.	1.01	22.10	133	.03	.01	.02	69.
1.01	8.10	49	.05	.03	.02	127.	1.01	22.20	134	.03	.01	.02	69.
1.01	8.20	50	.05	.03	.02	151.	1.01	22.30	135	.03	.01	.02	69.
1.01	8.30	51	.05	.03	.02	168.	1.01	22.40	136	.03	.01	.02	69.
1.01	8.40	52	.05	.03	.02	180.	1.01	22.50	137	.03	.01	.02	69.
1.01	8.50	53	.05	.03	.02	189.	1.01	23.00	138	.03	.01	.02	69.
1.01	9.00	54	.05	.03	.02	195.	1.01	23.10	139	.03	.01	.02	69.
1.01	9.10	55	.05	.03	.02	200.	1.01	23.20	140	.03	.01	.02	69.
1.01	9.20	56	.05	.03	.02	203.	1.01	23.30	141	.03	.01	.02	69.
1.01	9.30	57	.05	.03	.02	205.	1.01	23.40	142	.03	.01	.02	69.

1.01	9.40	58	.05	.03	.02	207.	1.01	23.50	143	.03	.01	.02	69.
1.01	9.50	59	.05	.03	.02	208.	1.02	0.00	144	.03	.01	.02	69.
1.01	10.00	60	.05	.03	.02	209.	1.02	.10	145	0.00	0.00	0.00	68.
1.01	10.10	61	.05	.03	.02	210.	1.02	.20	146	0.00	0.00	0.00	65.
1.01	10.20	62	.05	.03	.02	210.	1.02	.30	147	0.00	0.00	0.00	58.
1.01	10.30	63	.05	.03	.02	211.	1.02	.40	148	0.00	0.00	0.00	49.
1.01	10.40	64	.05	.03	.02	211.	1.02	.50	149	0.00	0.00	0.00	39.
1.01	10.50	65	.05	.03	.02	211.	1.02	1.00	150	0.00	0.00	0.00	30.
1.01	11.00	66	.05	.03	.02	211.	1.02	1.10	151	0.00	0.00	0.00	23.
1.01	11.10	67	.05	.03	.02	211.	1.02	1.20	152	0.00	0.00	0.00	18.
1.01	11.20	68	.05	.03	.02	211.	1.02	1.30	153	0.00	0.00	0.00	14.
1.01	11.30	69	.05	.03	.02	211.	1.02	1.40	154	0.00	0.00	0.00	12.
1.01	11.40	70	.05	.03	.02	211.	1.02	1.50	155	0.00	0.00	0.00	10.
1.01	11.50	71	.05	.03	.02	211.	1.02	2.00	156	0.00	0.00	0.00	8.
1.01	12.00	72	.05	.03	.02	211.	1.02	2.10	157	0.00	0.00	0.00	7.
1.01	12.10	73	.34	.32	.02	239.	1.02	2.20	158	0.00	0.00	0.00	7.
1.01	12.20	74	.34	.32	.02	325.	1.02	2.30	159	0.00	0.00	0.00	6.
1.01	12.30	75	.34	.32	.02	507.	1.02	2.40	160	0.00	0.00	0.00	6.
1.01	12.40	76	.34	.32	.02	761.	1.02	2.50	161	0.00	0.00	0.00	5.
1.01	12.50	77	.34	.32	.02	1033.	1.02	3.00	162	0.00	0.00	0.00	5.
1.01	13.00	78	.34	.32	.02	1282.	1.02	3.10	163	0.00	0.00	0.00	5.
1.01	13.10	79	.41	.39	.02	1496.	1.02	3.20	164	0.00	0.00	0.00	5.
1.01	13.20	80	.41	.39	.02	1663.	1.02	3.30	165	0.00	0.00	0.00	5.
1.01	13.30	81	.41	.39	.02	1808.	1.02	3.40	166	0.00	0.00	0.00	5.
1.01	13.40	82	.41	.39	.02	1941.	1.02	3.50	167	0.00	0.00	0.00	5.
1.01	13.50	83	.41	.39	.02	2059.	1.02	4.00	168	0.00	0.00	0.00	5.
1.01	14.00	84	.41	.39	.02	2155.	1.02	4.10	169	0.00	0.00	0.00	5.
1.01	14.10	85	.51	.49	.02	2242.	1.02	4.20	170	0.00	0.00	0.00	5.
									SUM	23.76	21.08	2.68	131335.
										(604.)	(535.)	(68.)	(3718.99)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7239.	3259.	911.	772.	131322.
CMS	205.	92.	26.	22.	3719.
INCHES		18.95	21.19	21.21	21.21
MM		481.25	538.20	538.69	538.69
AC-FT		1616.	1807.	1809.	1809.
THOUS CU M		1993.	2229.	2231.	2231.

HYDROGRAPH AT STA A1 FOR PLAN 1, RTIO 3

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	4.	9.	19.	34.	49.	64.	76.
84.	90.	95.	98.	100.	102.	103.	104.	104.	105.
105.	105.	105.	105.	106.	106.	106.	106.	106.	106.
106.	106.	114.	163.	254.	381.	516.	641.	748.	831.
904.	970.	1029.	1078.	1121.	1163.	1214.	1273.	1330.	1382.
1421.	1459.	1541.	1826.	2340.	3015.	3501.	3619.	3440.	3083.
2639.	2285.	2036.	1850.	1691.	1556.	1443.	1351.	1265.	1163.
1019.	841.	661.	499.	365.	269.	201.	152.	118.	94.
77.	65.	56.	49.	45.	41.	39.	37.	36.	35.
35.	34.	34.	34.	34.	34.	34.	34.	34.	34.
34.	34.	34.	34.	34.	32.	29.	25.	20.	15.
12.	9.	7.	6.	5.	4.	4.	3.	3.	3.
3.	3.	3.	2.	2.	2.	2.	2.	2.	2.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3619.	1629.	456.	386.	65661.
CMS	102.	46.	13.	11.	1859.
INCHES		9.47	10.59	10.60	10.60
MM		240.63	269.10	269.35	269.35
AC-FT		808.	904.	904.	904.
THOUS CU M		997.	1115.	1116.	1116.

PLAN 2 SAME AS PLAN 1

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HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THROUGH ALLAMUCHY POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A2	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	336.	-1

STAGE	795.00	795.50	796.00	796.50	797.00	797.10	797.50	798.00	798.50	799.00
	799.50	800.00	802.00							
FLOW	0.00	13.00	38.00	68.00	105.00	113.00	206.00	471.00	824.00	1387.00
	2094.00	2855.00	7137.00							
CAPACITY=	0.	280.	336.	400.	407.	472.	552.	640.		
ELEVATION=	784.	795.	796.	797.	797.	798.	799.	800.		

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
795.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
797.1	0.0	0.0	0.

DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
40.	1.00	784.10	1.00	795.00	797.10

•OVN•

STATION A2, PLAN 1, RATIO 3

BEGIN DAM FAILURE AT 14.17 HOURS

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	3.	4.	4.	5.	5.	6.	7.	7.	8.
8.	9.	10.	10.	11.	11.	12.	13.	13.	15.
16.	17.	18.	19.	22.	25.	31.	37.	46.	55.
66.	79.	93.	108.	149.	671.	1523.	2539.	3639.	4738.
5722.	4471.	3505.	2957.	2707.	2698.	2858.	3062.	3202.	3220.
3112.	2922.	2704.	2492.	2298.	2121.	1963.	1823.	1698.	1585.
1471.	1351.	1221.	1088.	958.	836.	727.	632.	551.	481.
422.	371.	329.	292.	261.	234.	212.	192.	175.	160.
147.	135.	125.	117.	109.	102.	96.	91.	86.	81.
77.	74.	71.	68.	65.	63.	60.	58.	55.	52.
49.	47.	44.	41.	39.	37.	35.	33.	31.	29.
28.	26.	25.	24.	22.	21.	20.	19.	18.	18.

STORAGE

280.	280.	280.	280.	280.	280.	280.	280.	280.	280.
280.	280.	280.	280.	280.	281.	281.	281.	281.	281.
281.	281.	281.	281.	281.	281.	281.	281.	281.	281.
281.	281.	281.	281.	281.	281.	281.	281.	281.	281.
281.	281.	281.	281.	281.	282.	282.	282.	283.	284.
285.	286.	288.	289.	290.	291.	293.	294.	295.	297.
298.	299.	301.	302.	303.	305.	306.	307.	309.	310.
311.	312.	314.	315.	318.	322.	328.	335.	344.	354.
365.	377.	390.	403.	416.	427.	429.	418.	393.	354.
301.	250.	216.	195.	184.	184.	191.	199.	204.	205.
201.	193.	184.	175.	167.	159.	151.	144.	138.	132.
126.	120.	112.	104.	96.	88.	81.	74.	67.	62.
57.	52.	48.	45.	42.	39.	36.	34.	32.	30.
28.	27.	26.	24.	23.	22.	22.	21.	20.	19.
19.	18.	18.	17.	17.	16.	16.	15.	15.	14.
14.	13.	13.	12.	12.	11.	11.	11.	10.	10.
9.	9.	9.	8.	8.	8.	8.	7.	7.	7.

STAGE

795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.1	795.1
795.1	795.1	795.1	795.2	795.2	795.2	795.2	795.3	795.3	795.3
795.3	795.3	795.4	795.4	795.4	795.4	795.5	795.5	795.5	795.5
795.6	795.6	795.6	795.6	795.7	795.7	795.9	796.0	796.1	796.3
796.5	796.6	796.8	797.0	797.2	797.4	797.4	797.3	796.9	796.3
795.4	793.8	792.5	791.7	791.3	791.3	791.5	791.8	792.1	792.1
791.9	791.6	791.3	790.9	790.6	790.3	790.0	789.7	789.5	789.2
789.0	788.8	788.5	788.2	787.8	787.5	787.2	787.0	786.7	786.5
786.3	786.1	786.0	785.8	785.7	785.6	785.5	785.4	785.3	785.3

785.2	785.2	785.1	785.1	785.0	785.0	784.9	784.9	784.9	784.9
784.8	784.8	784.8	784.8	784.7	784.7	784.7	784.7	784.7	784.7
784.6	784.6	784.6	784.6	784.6	784.5	784.5	784.5	784.5	784.5
784.5	784.5	784.4	784.4	784.4	784.4	784.4	784.4	784.4	784.4

PEAK OUTFLOW IS 5722. AT TIME 15.17 HOURS

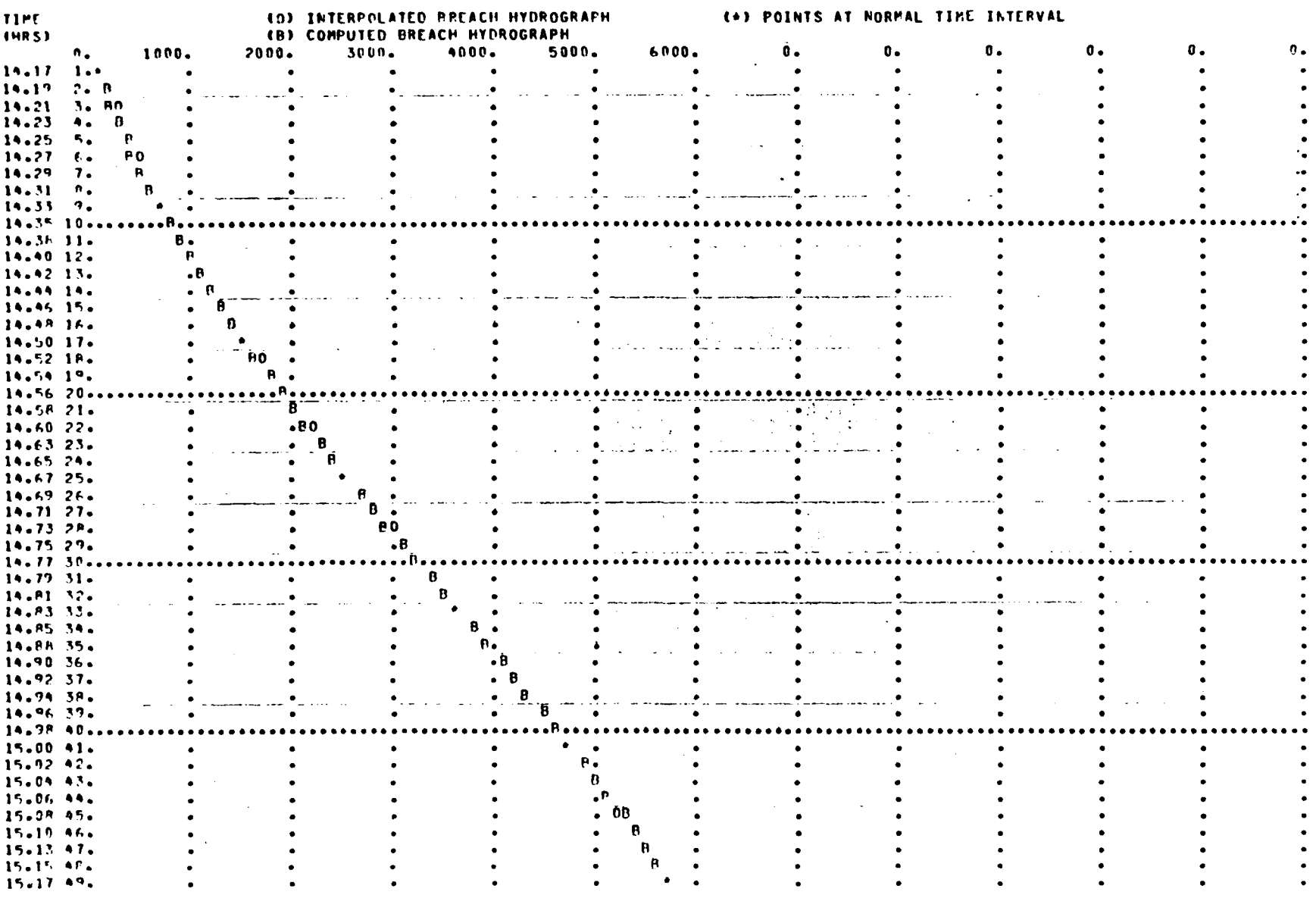
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5722.	2218.	594.	503.	85487.
CMS	162.	63.	17.	14.	2421.
INCHES		12.89	13.81	13.81	13.81
MM		327.47	350.65	350.67	350.67
AC-FT		1100.	1177.	1178.	1178.
THOUS CU M		1356.	1452.	1452.	1452.

THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .021 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF .167 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	-	COMPUTED BREACH HYDROGRAPH (CFS)	=	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
14.167	0.000	149.		149.		0.	0.	0.
14.188	.021	214.		183.		31.	31.	0.
14.208	.042	280.		230.		50.	81.	0.
14.229	.063	345.		286.		59.	140.	0.
14.250	.083	410.		350.		60.	200.	0.
14.271	.104	475.		422.		54.	254.	0.
14.292	.125	541.		499.		41.	295.	1.
14.313	.146	606.		583.		23.	319.	1.
14.333	.167	671.		671.		0.	319.	1.
14.354	.188	778.		764.		13.	332.	1.
14.375	.208	884.		862.		22.	354.	1.
14.396	.229	991.		964.		27.	381.	1.
14.417	.250	1097.		1069.		28.	409.	1.
14.438	.271	1204.		1178.		26.	434.	1.
14.458	.292	1310.		1290.		20.	454.	1.
14.479	.313	1417.		1405.		11.	466.	1.
14.500	.333	1523.		1523.		0.	466.	1.
14.521	.354	1650.		1643.		7.	472.	1.
14.542	.375	1777.		1766.		11.	483.	1.
14.563	.396	1904.		1891.		13.	497.	1.
14.583	.417	2031.		2017.		14.	510.	1.
14.604	.438	2158.		2146.		12.	523.	1.
14.625	.458	2285.		2275.		10.	532.	1.
14.646	.479	2412.		2407.		5.	538.	1.
14.667	.500	2539.		2539.		0.	538.	1.
14.688	.521	2676.		2672.		4.	542.	1.
14.708	.542	2814.		2806.		7.	549.	1.
14.729	.563	2951.		2941.		10.	559.	1.
14.750	.583	3089.		3077.		12.	571.	1.
14.771	.604	3226.		3218.		9.	580.	1.
14.792	.625	3364.		3360.		4.	585.	1.
14.813	.646	3501.		3500.		2.	586.	1.
14.833	.667	3639.		3639.		0.	586.	1.
14.854	.688	3776.		3778.		-1.	585.	1.
14.875	.708	3914.		3916.		-3.	582.	1.
14.896	.729	4051.		4054.		-3.	579.	1.
14.917	.750	4189.		4192.		-3.	576.	1.
14.938	.771	4326.		4329.		-3.	573.	1.
14.958	.792	4464.		4466.		-2.	570.	1.
14.979	.812	4601.		4603.		-2.	569.	1.
15.000	.833	4738.		4738.		-0.	569.	1.
15.021	.854	4861.		4873.		-12.	557.	1.
15.042	.875	4984.		5007.		-22.	534.	1.
15.063	.896	5107.		5139.		-32.	503.	1.
15.083	.917	5230.		5258.		-28.	474.	1.
15.104	.937	5353.		5376.		-23.	451.	1.
15.125	.958	5476.		5492.		-16.	435.	1.
15.146	.979	5599.		5606.		-8.	427.	1.
15.167	1.000	5722.		5722.		0.	427.	1.

•OVF•

STATION A2



DAM BREACH DATA

BRWID	Z	ELBM	TFAIL	WSEL	FAILEL
60.	.50	784.10	1.00	795.00	830.00

STATION A2, PLAN 2, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	3.	4.	4.	5.	5.	6.	7.	7.	8.
8.	9.	10.	10.	11.	11.	12.	13.	13.	15.
16.	17.	18.	19.	22.	25.	31.	37.	46.	55.
66.	79.	93.	108.	143.	187.	260.	354.	446.	545.
643.	734.	822.	973.	1169.	1442.	1804.	2158.	2450.	2622.
2673.	2628.	2529.	2404.	2269.	2132.	2004.	1883.	1768.	1658.
1545.	1422.	1300.	1173.	1042.	914.	804.	732.	664.	600.
541.	487.	444.	406.	371.	340.	311.	285.	261.	240.
220.	204.	197.	190.	183.	177.	171.	165.	159.	154.
149.	144.	139.	134.	130.	126.	122.	118.	114.	112.
110.	109.	107.	105.	104.	102.	101.	99.	98.	96.
95.	93.	92.	91.	89.	88.	87.	85.	84.	83.

STORAGE

280.	280.	280.	280.	280.	280.	280.	280.	280.	280.
280.	280.	280.	280.	280.	281.	281.	281.	281.	281.
281.	281.	281.	281.	281.	281.	281.	281.	281.	281.
281.	281.	281.	281.	281.	281.	281.	281.	281.	281.
281.	281.	281.	281.	281.	282.	282.	282.	283.	284.
285.	286.	288.	289.	290.	291.	293.	294.	295.	297.
298.	299.	301.	302.	303.	305.	306.	307.	309.	310.
311.	312.	314.	315.	317.	322.	328.	335.	344.	354.
365.	377.	390.	403.	416.	430.	443.	456.	469.	480.
491.	502.	512.	523.	537.	555.	578.	600.	617.	627.
629.	627.	621.	614.	606.	598.	590.	583.	576.	569.
562.	554.	546.	537.	527.	518.	510.	502.	494.	487.
480.	474.	468.	463.	458.	454.	450.	447.	443.	440.
438.	435.	433.	431.	429.	427.	425.	423.	421.	420.
418.	417.	415.	414.	412.	411.	410.	408.	407.	406.
405.	403.	402.	400.	399.	398.	396.	395.	394.	393.
391.	390.	389.	388.	386.	385.	384.	383.	382.	381.

STAGE

795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0
795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.0	795.1	795.1
795.1	795.1	795.1	795.2	795.2	795.2	795.2	795.3	795.3	795.3
795.3	795.3	795.4	795.4	795.4	795.4	795.5	795.5	795.5	795.5
795.6	795.6	795.6	795.6	795.7	795.7	795.9	796.0	796.1	796.3
796.5	796.6	796.8	797.0	797.2	797.4	797.6	797.8	798.0	798.1
798.2	798.4	798.5	798.6	798.8	799.0	799.3	799.5	799.7	799.8
799.9	799.9	799.8	799.7	799.6	799.5	799.4	799.4	799.3	799.2
799.1	799.0	798.9	798.8	798.7	798.6	798.5	798.4	798.3	798.2
798.1	798.0	797.9	797.9	797.8	797.8	797.7	797.6	797.6	797.6
797.5	797.5	797.5	797.4	797.4	797.4	797.3	797.3	797.3	797.3
797.3	797.2	797.2	797.2	797.2	797.2	797.1	797.1	797.1	797.1
797.1	797.0	797.0	797.0	797.0	797.0	796.9	796.9	796.9	796.9
796.9	796.8	796.8	796.8	796.8	796.8	796.8	796.7	796.7	796.7

PEAK OUTFLOW IS 2673. AT TIME 16.83 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2673.	1383.	405.	343.	58384.
CMS	76.	39.	11.	10.	1653.
INCHES		8.04	9.43	9.43	9.43
MM		204.31	239.48	239.50	239.50
AC-FT		686.	804.	804.	804.
THOUS CU M		846.	992.	992.	992.

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HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THROUGH I-80 ROAD EMBANKMENT

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A3	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	-1

STAGE	735.00	739.00	741.00	743.00	745.00	747.00	749.00	751.00	753.00	755.00
	757.00	759.00	767.00	775.00	783.00	785.00	795.00			
FLOW	0.00	130.00	260.00	400.00	550.00	650.00	750.00	830.00	900.00	970.00
	1030.00	1100.00	1300.00	1500.00	1650.00	1700.00	2000.00			
CAPACITY=	0.	14.	29.	45.	62.	71.	92.	116.	152.	181.
	214.	250.	288.	330.	376.	470.				
ELEVATION=	735.	739.	741.	743.	745.	747.	749.	751.	753.	755.
	757.	759.	761.	763.	765.	780.				

CREL	SPWID	COQW	EXPW	ELEVL	COOL	CAREA	EXPL
735.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
795.0	0.0	0.0	0.

STATION A3, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	4.	4.
5.	5.	6.	6.	7.	7.	8.	8.	9.	9.
10.	11.	12.	13.	13.	15.	16.	18.	21.	25.
29.	34.	40.	48.	57.	100.	214.	420.	703.	855.
984.	1089.	1145.	1179.	1205.	1228.	1253.	1344.	1440.	1526.
1592.	1650.	1714.	1770.	1810.	1836.	1849.	1852.	1846.	1833.
1813.	1788.	1756.	1717.	1677.	1639.	1605.	1567.	1528.	1483.
1428.	1372.	1318.	1264.	1239.	1224.	1210.	1194.	1178.	1161.
1144.	1126.	1108.	1086.	1060.	1035.	1012.	989.	966.	937.
909.	885.	864.	843.	817.	783.	750.	707.	665.	598.
526.	471.	422.	379.	340.	306.	275.	248.	224.	202.
182.	165.	149.	135.	122.	110.	99.	90.	81.	74.

STORAGE

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.	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.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	3.
3.	4.	4.	5.	6.	11.	24.	47.	82.	129.
188.	244.	284.	312.	335.	355.	377.	400.	424.	447.
469.	489.	504.	516.	524.	530.	532.	533.	532.	529.
525.	520.	513.	505.	496.	485.	474.	461.	448.	434.
421.	407.	393.	379.	366.	352.	339.	325.	311.	297.
284.	270.	256.	243.	230.	217.	204.	191.	179.	167.
156.	144.	133.	122.	112.	102.	92.	83.	74.	66.
59.	53.	48.	43.	38.	34.	31.	28.	25.	22.
20.	18.	16.	15.	13.	12.	11.	10.	9.	8.

STAGE

735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.1	735.1	735.1	735.1	735.1	735.1	735.1
735.1	735.2	735.2	735.2	735.2	735.2	735.2	735.3	735.3	735.3
735.3	735.3	735.4	735.4	735.4	735.5	735.5	735.6	735.7	735.8

735.9	736.1	736.2	736.5	736.8	739.1	740.3	743.3	748.1	751.7
755.5	758.7	760.8	762.2	763.2	764.1	765.1	768.8	772.6	776.4
779.9	783.0	785.5	787.3	788.7	789.5	790.0	790.1	789.9	789.4
788.8	787.9	786.9	785.6	784.1	782.4	780.6	778.6	776.5	774.3
772.1	769.9	767.7	765.6	764.5	764.0	763.4	762.8	762.1	761.4
760.8	760.1	759.3	758.6	757.9	757.2	756.4	755.6	754.9	754.1
753.3	752.6	752.0	751.4	750.7	749.8	749.0	748.1	747.3	746.8
744.7	743.9	743.3	742.7	742.1	741.7	741.2	740.8	740.4	740.1
739.8	739.5	739.3	739.1	738.7	738.4	738.0	737.8	737.5	737.3

PEAK OUTFLOW IS 1852. AT TIME 18.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1852.	1525.	590.	499.	84913.
CMS	52.	43.	17.	14.	2404.
INCHES		8.87	13.71	13.71	13.71
MM		225.27	348.31	348.32	348.32
AC-FT		756.	1170.	1170.	1170.
THOUS CU M		933.	1443.	1443.	1443.

STATION A3, PLAN 2, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	4.	4.
5.	5.	6.	6.	7.	7.	8.	8.	9.	9.
10.	11.	12.	13.	13.	15.	16.	18.	21.	25.
29.	34.	40.	48.	57.	70.	88.	115.	148.	187.
233.	284.	341.	404.	480.	581.	685.	762.	831.	876.
928.	981.	1021.	1058.	1092.	1114.	1132.	1146.	1158.	1167.
1174.	1179.	1182.	1183.	1181.	1178.	1173.	1166.	1159.	1150.
1140.	1128.	1117.	1104.	1087.	1068.	1048.	1028.	1010.	991.
972.	948.	924.	900.	881.	862.	844.	824.	794.	765.
733.	696.	660.	599.	536.	489.	447.	410.	376.	346.
320.	296.	274.	255.	238.	223.	209.	197.	186.	176.
167.	159.	151.	145.	138.	133.	127.	122.	118.	114.

STORAGE

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.	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.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	3.
3.	4.	4.	5.	6.	8.	10.	12.	16.	21.
26.	32.	38.	45.	54.	65.	78.	96.	116.	140.
164.	187.	209.	228.	246.	261.	274.	285.	294.	302.
308.	312.	315.	315.	314.	312.	307.	302.	295.	288.
280.	272.	263.	253.	243.	233.	223.	213.	203.	193.
182.	172.	162.	152.	142.	133.	123.	114.	105.	97.
88.	81.	73.	66.	60.	55.	50.	46.	42.	39.
36.	33.	31.	28.	26.	25.	23.	22.	20.	19.
18.	17.	16.	16.	15.	14.	14.	13.	13.	12.

STAGE

735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0	735.0
735.0	735.0	735.0	735.1	735.1	735.1	735.1	735.1	735.1	735.1
735.1	735.2	735.2	735.2	735.2	735.2	735.2	735.3	735.3	735.3
735.3	735.3	735.4	735.4	735.4	735.5	735.5	735.6	735.7	735.8
735.9	736.1	736.2	736.5	736.8	737.2	737.7	738.5	739.3	739.9
740.6	741.3	742.2	743.1	744.1	745.6	747.7	749.3	751.0	752.3
753.8	755.4	756.7	757.8	758.8	759.6	760.3	760.8	761.3	761.7
761.9	762.1	762.3	762.3	762.3	762.1	761.9	761.6	761.3	761.0
760.6	760.1	759.7	759.2	758.6	758.1	757.5	756.9	756.3	755.7
755.1	754.4	753.7	753.0	752.5	751.9	751.4	750.8	750.1	749.4
748.7	747.9	747.2	746.0	744.8	744.2	743.6	743.1	742.7	742.2
741.9	741.5	741.2	740.9	740.7	740.4	740.2	740.0	739.9	739.7
739.6	739.4	739.3	739.2	739.1	739.0	738.9	738.8	738.6	738.5

PEAK OUTFLOW IS 1183. AT TIME 19.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1183.	1076.	399.	338.	57496.
CMS	33.	30.	11.	10.	1628.
INCHES		6.26	9.29	9.29	9.29
MM		158.89	235.84	235.85	235.85
AC-FT		534.	792.	792.	792.
THOUS CU M		658.	977.	977.	977.

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HYDROGRAPH ROUTING

ROUTE FLOW FROM CULVERT OUTLET 400 FEET DOWNSTREAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A4	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME
ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	0

	QW(1)	FLNVT	FLMAX	RLNTH	SEL
	.1000	698.0	720.0	400.	.06800

SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 720.00 960.00 710.00 985.00 702.00 995.00 698.00 1005.00 698.00
1015.00 702.00 1030.00 710.00 1100.00 720.00

	0.00	.14	.34	.60	.92	1.30	1.75	2.25	2.82	3.45
	4.14	4.91	5.82	6.88	8.09	9.45	10.95	12.60	14.40	16.35
AREA	0.00	137.15	491.37	1086.02	2061.42	3428.39	5101.79	7082.79	9374.64	11981.91
	14910.10	18080.41	21624.06	25618.27	30086.31	35055.50	40553.82	46608.94	53248.00	60497.48
WSEL	698.00	699.16	700.32	701.47	702.63	703.79	704.95	706.11	707.26	708.42
	709.58	710.74	711.89	713.05	714.21	715.37	716.53	717.68	718.84	720.00
FLOW	0.00	137.15	491.37	1086.02	2061.42	3428.39	5101.79	7082.79	9374.64	11981.91
	14910.10	18080.41	21624.06	25618.27	30086.31	35055.50	40553.82	46608.94	53248.00	60497.48

STATION A4, PLAN 2, RTIO 3

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	4.	4.
5.	5.	6.	6.	7.	7.	8.	8.	9.	9.
10.	11.	12.	12.	13.	15.	16.	18.	21.	24.
29.	34.	40.	47.	56.	69.	87.	113.	146.	186.
230.	283.	338.	401.	477.	578.	682.	761.	828.	876.
925.	980.	1019.	1058.	1091.	1115.	1131.	1146.	1157.	1167.
1173.	1179.	1181.	1183.	1181.	1178.	1173.	1167.	1159.	1150.
1140.	1129.	1117.	1105.	1088.	1069.	1049.	1029.	1010.	992.
973.	949.	924.	901.	881.	863.	845.	825.	795.	766.
734.	697.	662.	602.	537.	491.	449.	411.	378.	347.
321.	297.	275.	256.	239.	224.	210.	198.	186.	176.
167.	159.	152.	145.	139.	133.	128.	123.	118.	114.

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.	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.	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.	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.	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.	0.	0.	0.

STAGE

698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0
698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0
698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0
698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0
698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0
698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0	698.0
698.0	698.0	698.0	698.1	698.1	698.1	698.1	698.1	698.1	698.1
698.1	698.1	698.1	698.1	698.1	698.1	698.1	698.2	698.2	698.2
698.2	698.3	698.3	698.4	698.5	698.6	698.7	699.0	699.2	699.3
699.5	699.6	699.8	700.0	700.3	700.5	700.7	700.8	701.0	701.1
701.2	701.3	701.3	701.4	701.5	701.5	701.5	701.5	701.6	701.6
701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6	701.6
701.5	701.5	701.5	701.5	701.5	701.4	701.4	701.4	701.3	701.3
701.3	701.2	701.2	701.1	701.1	701.0	701.0	701.0	700.9	700.9
700.8	700.7	700.6	700.5	700.4	700.3	700.2	700.1	699.9	699.8
699.8	699.7	699.6	699.5	699.5	699.4	699.4	699.4	699.3	699.3
699.3	699.2	699.2	699.2	699.2	699.1	699.1	699.0	699.0	699.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1183.	1076.	399.	338.	57488.
CMS	33.	30.	11.	10.	1628.
INCHES		6.26	9.28	9.28	9.28
MM		158.89	235.81	235.82	235.82
AC-FT		534.	792.	792.	792.
THOUS CU M		658.	977.	977.	977.

MAXIMUM STORAGE = 1.

MAXIMUM STAGE IS 701.6

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HYDROGRAPH ROUTING

ROUTE FLOW 1000FEET FURTHERDOWNSTREAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A5	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	0

NORMAL DEPTH CHANNEL ROUTING

GN(1)	GN(2)	GN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0400	.1000	633.0	647.0	1000.	.06500

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
880.00 647.00 950.00 640.00 980.00 635.00 995.00 633.00 1005.00 633.00
1020.00 635.00 1100.00 640.00 1210.00 647.00

STORAGE	0.00	.26	.71	1.35	2.24	3.41	4.85	6.57	8.55	10.82
	13.36	16.22	19.40	22.90	26.72	30.86	35.32	40.10	45.20	50.62
OUTFLOW	0.00	72.13	286.83	711.48	1427.35	2379.80	3581.29	5044.84	6783.80	8811.63
	11127.99	13756.88	16730.73	20065.48	23777.12	27881.48	32394.15	37330.48	42705.55	48534.28
STAGE	633.00	633.74	634.47	635.21	635.95	636.68	637.42	638.16	638.89	639.63
	640.37	641.11	641.84	642.58	643.32	644.05	644.79	645.53	646.26	647.00
FLOW	0.00	72.13	286.83	711.48	1427.35	2379.80	3581.29	5044.84	6783.80	8811.63
	11127.99	13756.88	16730.73	20065.48	23777.12	27881.48	32394.15	37330.48	42705.55	48534.28

STATION A5, PLAN 1, RTIO 3

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	4.	4.
4.	5.	5.	6.	6.	7.	8.	8.	9.	9.
10.	11.	11.	12.	13.	14.	16.	18.	20.	23.
27.	32.	38.	45.	54.	84.	187.	380.	662.	850.
961.	1082.	1139.	1176.	1202.	1225.	1249.	1329.	1432.	1515.
1587.	1642.	1787.	1768.	1807.	1833.	1848.	1852.	1847.	1835.
1816.	1791.	1760.	1722.	1682.	1643.	1608.	1572.	1532.	1498.
1434.	1378.	1324.	1270.	1240.	1227.	1211.	1196.	1179.	1163.
1146.	1128.	1110.	1088.	1064.	1038.	1015.	992.	969.	941.
912.	888.	866.	845.	820.	787.	754.	713.	671.	610.
535.	478.	430.	385.	346.	311.	280.	253.	228.	206.
186.	168.	152.	138.	125.	112.	101.	92.	83.	75.

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.	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.	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.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	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.	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.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.1	633.1	633.1	633.1	633.1	633.1	633.1	633.1	633.1
633.1	633.1	633.1	633.1	633.1	633.1	633.2	633.2	633.2	633.2
633.3	633.3	633.4	633.5	633.6	633.8	634.1	634.6	635.1	635.4
635.5	635.6	635.7	635.7	635.7	635.7	635.8	635.8	636.0	636.0
636.1	636.1	636.2	636.2	636.2	636.3	636.3	636.3	636.3	636.3
636.2	636.2	636.2	636.2	636.1	636.1	636.1	636.1	636.0	636.0
636.0	635.9	635.8	635.8	635.8	635.7	635.7	635.7	635.7	635.7
635.7	635.6	635.6	635.6	635.6	635.5	635.5	635.5	635.5	635.4
635.4	635.4	635.4	635.3	635.3	635.3	635.3	635.2	635.1	635.0
634.9	634.8	634.7	634.6	634.6	634.5	634.5	634.4	634.3	634.2
634.1	634.1	634.0	634.0	633.9	633.9	633.8	633.8	633.8	633.7

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1852.	1526.	589.	499.	84888.
CMS	52.	43.	17.	14.	2404.
INCHES		8.87	13.71	13.71	13.71
MM		225.28	348.20	348.22	348.22
AC-FT		756.	1169.	1169.	1169.
THOUS CU M		933.	1442.	1442.	1442.

MAXIMUM STORAGE = 3.

MAXIMUM STAGE IS 636.3

STATION A5, PLAN 2, RTIO 3

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	4.	4.
4.	5.	5.	6.	6.	7.	8.	8.	9.	9.
10.	11.	11.	12.	13.	14.	16.	18.	20.	23.
27.	32.	38.	45.	54.	65.	84.	108.	140.	179.
223.	274.	332.	393.	468.	565.	671.	755.	822.	873.
920.	976.	1016.	1053.	1088.	1112.	1130.	1145.	1156.	1166.
1173.	1178.	1182.	1182.	1182.	1178.	1174.	1167.	1160.	1151.
1141.	1130.	1118.	1105.	1089.	1070.	1051.	1031.	1012.	993.
975.	951.	926.	903.	883.	865.	846.	827.	798.	768.
738.	700.	665.	619.	544.	495.	454.	415.	361.	351.
323.	299.	278.	259.	241.	226.	212.	199.	188.	178.
169.	160.	153.	146.	140.	134.	129.	124.	119.	115.

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.	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.	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.	1.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	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.	1.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0	633.0
633.0	633.1	633.1	633.1	633.1	633.1	633.1	633.1	633.1	633.1
633.1	633.1	633.1	633.1	633.1	633.1	633.2	633.2	633.2	633.2
633.3	633.3	633.4	633.5	633.5	633.7	633.8	633.9	634.0	634.1
634.3	634.4	634.6	634.7	634.8	635.0	635.1	635.3	635.3	635.4
635.4	635.5	635.5	635.6	635.6	635.6	635.6	635.7	635.7	635.7
635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7	635.7
635.7	635.6	635.6	635.6	635.6	635.6	635.6	635.5	635.5	635.5
635.5	635.5	635.4	635.4	635.4	635.4	635.3	635.3	635.3	635.3
635.2	635.2	635.1	635.0	634.9	634.8	634.8	634.7	634.6	634.6
634.5	634.5	634.4	634.4	634.3	634.3	634.2	634.2	634.1	634.1
634.1	634.0	634.0	634.0	634.0	633.9	633.9	633.9	633.9	633.9

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1182.	1076.	399.	338.	57462.
CMS	33.	30.	11.	10.	1627.
INCHES		6.26	9.28	9.28	9.28
MM		158.90	235.70	235.71	235.71
AC-FT		534.	791.	791.	791.
THOUS CU M		658.	976.	976.	976.

MAXIMUM STORAGE = 2.

MAXIMUM STAGE IS 635.7

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTE FLOW TO DAMAGE CENTER, ANOTHER 450 FEET DOWNSTREAM

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
A6	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELMVT	ELMAX	RLNTH	SEL
.1000	.0400	.1000	598.0	610.0	450.	.07000

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

600.00 610.00 970.00 605.00 990.00 602.00 998.00 598.00 1002.00 598.00
1010.00 604.00 1070.00 606.00 1170.00 610.00

STORAGE	0.00	.03	.08	.14	.21	.30	.40	.52	.68	.87
	1.09	1.46	1.99	2.71	3.58	4.62	5.82	7.18	8.70	10.38
OUTFLOW	0.00	19.64	68.93	150.12	267.47	425.32	627.87	901.66	1240.92	1640.75
	2136.53	2762.62	3514.17	4452.06	5604.89	6989.08	8626.47	10538.10	12744.20	15264.34
STAGE	598.00	598.63	599.26	599.89	600.53	601.16	601.79	602.42	603.05	603.68
	604.32	604.95	605.58	606.21	606.84	607.47	608.11	608.74	609.37	610.00
FLOW	0.00	19.64	68.93	150.12	267.47	425.32	627.87	901.66	1240.92	1640.75
	2136.53	2762.62	3514.17	4452.06	5604.89	6989.08	8626.47	10538.10	12744.20	15264.34

STATION 4C, PLAN 1, RTIO 3

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	3.	4.
4.	5.	5.	6.	6.	7.	7.	8.	9.	9.
10.	11.	11.	12.	13.	14.	16.	17.	20.	23.
27.	32.	38.	45.	53.	82.	179.	371.	651.	849.
955.	1080.	1137.	1175.	1202.	1225.	1249.	1324.	1429.	1512.
1585.	1640.	1704.	1763.	1805.	1833.	1848.	1852.	1847.	1835.
1816.	1792.	1761.	1723.	1683.	1645.	1609.	1573.	1533.	1490.
1436.	1380.	1326.	1272.	1240.	1227.	1211.	1197.	1180.	1164.
1147.	1129.	1111.	1090.	1065.	1039.	1015.	993.	969.	942.
913.	889.	867.	846.	821.	788.	755.	715.	672.	612.
537.	480.	432.	386.	348.	312.	281.	255.	229.	207.
187.	169.	153.	138.	126.	113.	102.	92.	83.	76.

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.	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.	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.	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.	1.	1.	1.	1.	1.	1.
1.	1.	1.	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.

STAGE

598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.1	598.1	598.1	598.1	598.1	598.1	598.1
598.1	598.2	598.2	598.2	598.2	598.2	598.2	598.3	598.3	598.3
598.3	598.3	598.4	598.4	598.4	598.5	598.5	598.6	598.6	598.7
598.7	598.8	598.9	599.0	599.1	599.4	600.1	600.9	601.8	602.3
602.5	602.8	602.9	602.9	603.0	603.0	603.1	603.2	603.3	603.5
603.6	603.7	603.8	603.8	603.9	603.9	603.9	604.0	603.9	603.9
603.9	603.9	603.8	603.8	603.7	603.7	603.6	603.6	603.5	603.4
603.4	603.3	603.2	603.1	603.1	603.0	603.0	603.0	602.9	602.9
602.9	602.8	602.8	602.8	602.7	602.7	602.6	602.6	602.5	602.5
602.4	602.4	602.3	602.3	602.2	602.2	602.1	602.0	601.9	601.7
601.5	601.3	601.2	601.0	600.8	600.7	600.6	600.5	600.3	600.2
600.1	600.0	599.9	599.8	599.7	599.6	599.5	599.4	599.4	599.3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1852.	1526.	589.	499.	84882.
CMS	52.	43.	17.	14.	2404.
INCHES		8.87	13.71	13.71	13.71
MM		225.28	348.18	348.19	348.19
AC-FT		756.	1169.	1169.	1169.
THOUS CU M		933.	1442.	1442.	1442.

STATION A6, PLAN 2, RTIO 3

OUTFLOW

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.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	3.	4.
4.	5.	5.	6.	6.	7.	7.	8.	9.	9.
10.	11.	11.	12.	13.	14.	16.	17.	20.	23.
27.	32.	38.	45.	53.	65.	82.	107.	138.	178.
221.	272.	330.	391.	465.	561.	668.	753.	820.	872.
918.	974.	1015.	1052.	1087.	1112.	1129.	1144.	1156.	1165.
1173.	1178.	1181.	1182.	1182.	1179.	1174.	1167.	1160.	1151.
1141.	1130.	1118.	1106.	1090.	1071.	1051.	1032.	1013.	994.
975.	952.	927.	904.	883.	866.	847.	827.	799.	769.
739.	702.	667.	612.	546.	496.	456.	416.	383.	352.
325.	300.	279.	260.	242.	227.	213.	200.	189.	178.
169.	161.	153.	146.	140.	134.	129.	124.	119.	115.

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.	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.	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.	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.	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.	0.	0.

STAGE

598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0	598.0
598.0	598.0	598.0	598.1	598.1	598.1	598.1	598.1	598.1	598.1
598.1	598.2	598.2	598.2	598.2	598.2	598.2	598.3	598.3	598.3
598.3	598.3	598.4	598.4	598.4	598.5	598.5	598.6	598.6	598.7
598.7	598.8	598.9	599.0	599.1	599.2	599.4	599.6	599.8	600.0
600.3	600.5	600.8	601.0	601.3	601.6	601.9	602.1	602.2	602.4
602.5	602.6	602.6	602.7	602.8	602.8	602.8	602.9	602.9	602.9
602.9	602.9	602.9	602.9	602.9	602.9	602.9	602.9	602.9	602.9
602.9	602.8	602.8	602.8	602.8	602.7	602.7	602.7	602.6	602.6
602.6	602.5	602.5	602.4	602.4	602.3	602.3	602.2	602.2	602.1
602.0	602.0	601.9	601.7	601.5	601.4	601.3	601.1	601.0	600.9
600.8	600.7	600.6	600.5	600.4	600.3	600.2	600.2	600.1	600.0
600.0	600.0	599.9	599.9	599.8	599.8	599.7	599.7	599.7	599.6

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1182.	1076.	399.	338.	57454.
CMS	33.	30.	11.	10.	1627.
INCHES		6.26	9.28	9.28	9.28
MM		158.90	235.67	235.68	235.68
AC-FT		534.	791.	791.	791.
THOUS CU M		658.	976.	976.	976.

MAXIMUM STORAGE = 1.

MAXIMUM STAGE IS 602.9

....

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .10	RATIO 2 .25	RATIO 3 .50
HYDROGRAPH AT	A1	1.60	1	724.	1810.	3619.
		(4.14)		(20.50)(	51.24)(	102.49)(
			2	724.	1810.	3619.
				(20.50)(	51.24)(	102.49)(
ROUTED TO	A2	1.60	1	4347.	5855.	5722.
		(4.14)		(123.08)(	165.80)(	162.02)(
			2	153.	996.	2673.
				(4.33)(	28.22)(	75.70)(
ROUTED TO	A3	1.60	1	1074.	1243.	1852.
		(4.14)		(30.42)(	35.19)(	52.44)(
			2	131.	713.	1183.
				(3.71)(	20.19)(	33.49)(
ROUTED TO	A4	1.60	1	1076.	1244.	1852.
		(4.14)		(30.47)(	35.22)(	52.44)(
			2	131.	713.	1183.
				(3.71)(	20.19)(	33.50)(
ROUTED TO	A5	1.60	1	1074.	1243.	1852.
		(4.14)		(30.40)(	35.18)(	52.44)(
			2	131.	713.	1182.
				(3.71)(	20.20)(	33.48)(
ROUTED TO	A6	1.60	1	1074.	1242.	1852.
		(4.14)		(30.41)(	35.18)(	52.45)(
			2	131.	713.	1182.
				(3.71)(	20.19)(	33.48)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	795.00	795.00	797.10
STORAGE	280.	280.	407.
OUTFLOW	0.	0.	113.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	797.13	.03	409.	4368.	.38	18.42	17.50
.25	797.29	.19	421.	5855.	.71	16.50	15.50
.50	797.41	.31	429.	5722.	.75	15.17	14.17

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	795.00	795.00	797.10
STORAGE	280.	280.	407.
OUTFLOW	0.	0.	113.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	797.27	.17	419.	153.	3.00	18.67	0.00
.25	798.65	1.55	524.	996.	8.33	17.17	0.00
.50	799.08	2.78	629.	2673.	10.83	16.83	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	735.00	735.00	795.00
STORAGE	0.	0.	564.
OUTFLOW	0.	0.	2000.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	758.27	0.00	237.	1074.	0.00	19.33	0.00
.25	764.71	0.00	369.	1243.	0.00	18.00	0.00
.50	790.06	0.00	533.	1852.	0.00	18.00	0.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	735.00	735.00	795.00
STORAGE	0.	0.	564.
OUTFLOW	0.	0.	2000.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	739.02	0.00	14.	131.	0.00	19.83	0.00
.25	748.26	0.00	84.	713.	0.00	18.83	0.00
.50	762.30	0.00	315.	1183.	0.00	19.00	0.00

PLAN 1 STATION A4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	1076.	701.5	19.33
.25	1244.	701.7	18.00
.50	1852.	702.4	18.00

PLAN 2 STATION A4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	131.	699.1	19.83
.25	713.	700.7	18.83
.50	1183.	701.6	19.00

PLAN 1 STATION A5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	1074.	635.6	19.33
.25	1243.	635.8	18.00

.50	1852.	636.3	18.00

PLAN 2 STATION A5

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	131.	633.9	19.83
.25	713.	635.2	18.83
.50	1182.	635.7	19.00

PLAN 1 STATION A6

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	1074.	602.7	19.33
.25	1242.	603.1	18.00
.50	1852.	604.0	18.00

PLAN 2 STATION A6

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.10	131.	599.7	19.83
.25	713.	602.0	18.83
.50	1182.	602.9	19.00

AD-A087 539 NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/13
NATIONAL DAM SAFETY PROGRAM. ALLAMUCHY POND DAM (NJ00501), DELA--ETC(U)
MAR 80 W A GUINAN DACW61-79-C-0011

UNCLASSIFIED NL

APPENDIX 4

REFERENCES

ALLAMUCHY POND DAM

APPENDIX 5

REFERENCES

ALLAMUCHY POND DAM

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