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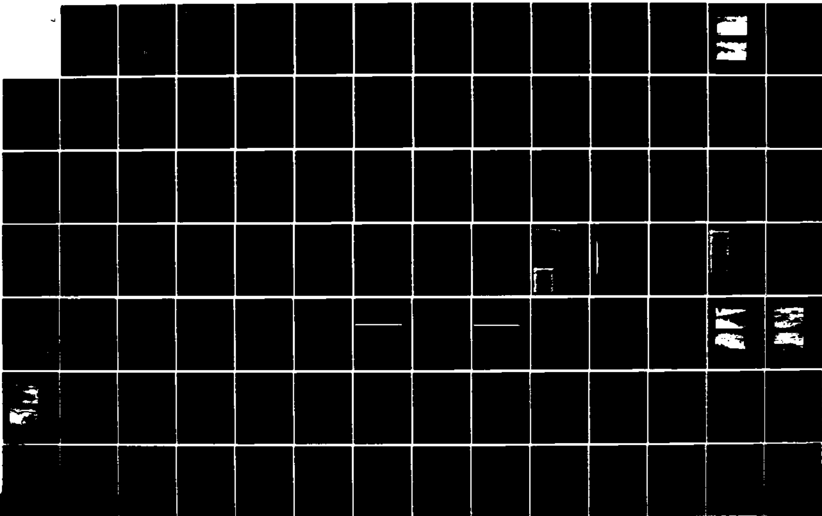

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POQUONOCK RIVER BASIN
GROTON, CONNECTICUT

POQUONOCK DAM
CT 00231

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

FEBRUARY, 1979

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

JUN 25 1979

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

I am forwarding to you a copy of the Poquonock Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, City of Groton, Department of Utilities, 295 Meridian Street, P.O. Box 820, Groton, Connecticut 06340.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

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Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

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

DAMS, INSPECTION, DAM SAFETY,

Poquonock River Basin
Groton, Conn.

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

Poquonock Reservoir Dam is a stonewall-earth structure about 285 ft. long, with a maximum height of about 12 ft. The maximum storage capacity of the reservoir to top of dam is about 1,660 acre-ft. and the drainage area is about 14 square miles. The test flood inflow is 6,700 cfs. Based on storage capacity, the dam is classified as intermediate in size. Based on intermediate size and high hazard the test flood is ½ PMF.

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POQUONOCK RESERVOIR DAM

CT 00231

POQUONOCK RIVER BASIN
GROTON, CONNECTICUT

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.	CT 00231
Name of Dam:	Poquonock Reservoir Dam
Town:	Groton
County and State:	New London, Connecticut
Stream:	Great Brook
Date of Inspection:	13 November 1978

BRIEF ASSESSMENT

Poquonock Reservoir Dam is a stonewall-earth structure about 285 ft. long, with a maximum height of about 12 ft. It was constructed in 1901 and is said to incorporate an earlier dam. The reservoir above the dam serves as a head pond and equalizing storage facility for the City of Groton's water supply system.

A 90 ft. length of the masonry wall and embankment, which is 3.25 ft. lower than the remainder of the dam, serves as a spillway. The only operative outlet is the intake to the pumping plant adjacent to the dam.

The maximum storage capacity of the reservoir to top of dam is about 1,660 acre-ft. and the drainage area is about 14 square miles. The reservoir is about 1.61 miles long with a surface of 184 acres at spillway crest elevation. Based on storage capacity, the dam is classified as intermediate in size. Because a breach of the dam might cause damage to the water treatment and pumping plant, other public utility facilities downstream of the dam, several commercial establishments, a church and U.S. Route 1, the dam has been classified as having a significant hazard potential. Based on intermediate size and high hazard, the test flood is ½ PMF.

The upstream slope of the embankment has become eroded by wave action above the present limits of riprap. There is also some embankment erosion near the spillway inlet walls. Brush and marsh growth have become established both upstream of the spillway and in the downstream channel. Minor seepage is evident in several locations on the face of the dam and at the end of the downstream riprap slope, while more serious leakage was noted through an abandoned filter and pumping plant. Both the dam and its appurtenant structures are judged to be in generally good condition.

The test flood inflow is 6,700 cfs. Provided that the stoplogs were not in place, the test flood would overtop the dam by about 2.5 ft., the total outflow being about 5,800 cfs. The spillway is adequate to pass an outflow corresponding to about 30 percent of the test flood; this figure would be lower with the stoplogs installed on the spillway crest.

Within one year after receipt of this Phase I Inspection Report, the owner, the City of Groton, should retain the services of a registered professional engineer to make hydrologic and structural investigations, and should implement the results. These studies should cover: (1) the elevation of the swale east of the dam and its impact on flood outflows; (2) the structural stability of the dam under flood surcharge loadings; (3) the adequacy of existing outlet facilities for emergency evacuation of the reservoir; (4) whether modifications to the dam and/or spillway are required to improve the ability of the facility to handle higher inflows; and (5) whether modifications are required to forestall a possible undermining of the downstream riprap slope.

The owner should also implement the following measures: (1) repair erosion on the upstream slope and extend the riprap protection; (2) repair scoured areas of the embankment adjacent to the spillway guide walls; (3) remove growth from the downstream channel and the area upstream of the spillway; (4) monitor once per month the seepage through the face of the dam and the downstream riprap slope; (5) investigate the leakage through the abandoned pumping plant and stop it if possible; monitor the leakage monthly; (6) develop a formal surveillance and warning plan from the present informal plan; and (7) continue the present practice of having semi-annual technical inspections.

Peter B. Dyson	Frederick Esper
Project Manager	Vice President
COMMONWEALTH OF MASSACHUSETTS PETER BRIAN DYSON No. 18452 REGISTERED PROFESSIONAL ENGINEER	COMMONWEALTH OF MASSACHUSETTS FREDERICK ESPER No. 8309 REGISTERED PROFESSIONAL ENGINEER

This Phase I Inspection Report on Poquonock Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

JOSEPH W. FINEGAN, JR., CHAIRMAN
Chief, Reservoir Control Center
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

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

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

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

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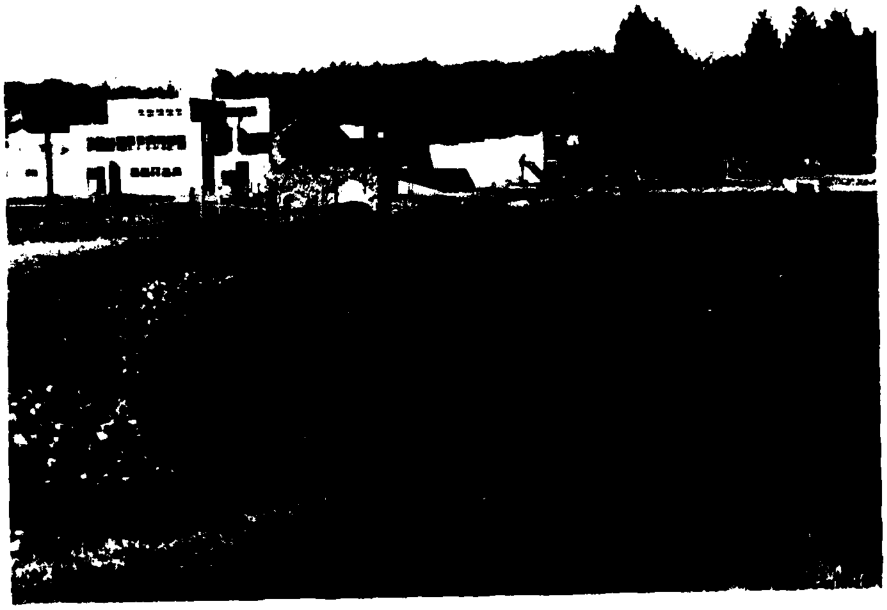
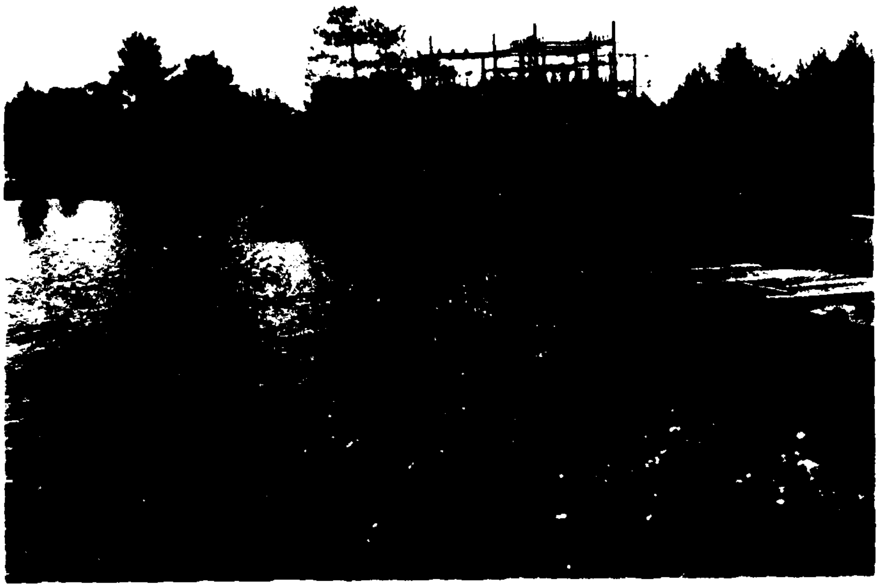
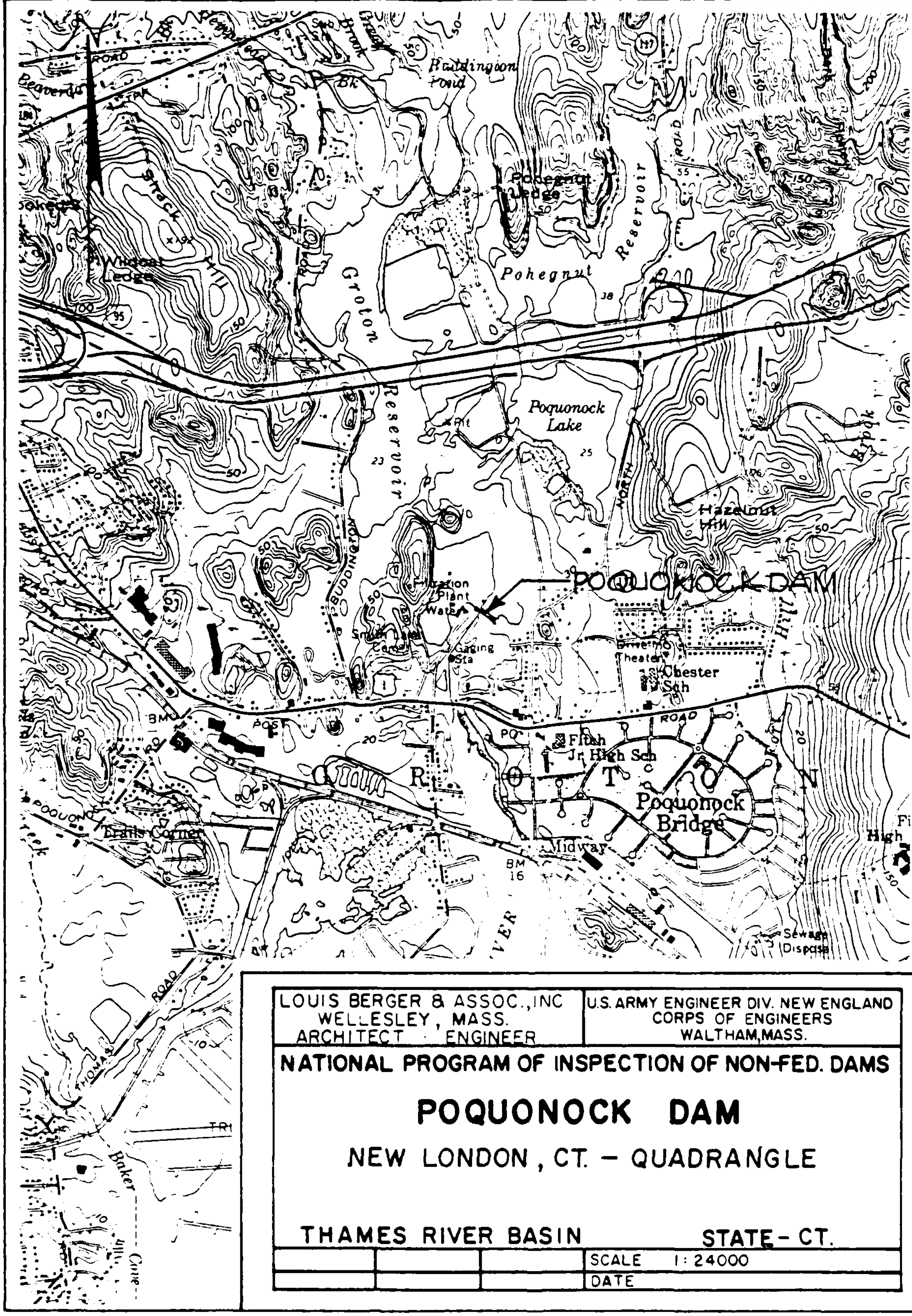


Overview from left abutment.



Overview from right abutment.



LOUIS BERGER & ASSOC.,INC
WELLESLEY, MASS.
ARCHITECT · ENGINEER

U.S. ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM,MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

POQUONOCK DAM

NEW LONDON, CT. – QUADRANGLE

THAMES RIVER BASIN

STATE – CT.

SCALE 1 : 24000

DATE

PHASE I INSPECTION REPORT

POQUONOCK RESERVOIR DAM CT 00231

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Louis Berger & Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to Louis Berger & Associates, Inc. under a letter of 27 October 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-78-C-0371, Job Change No. 1, has been assigned by the Corps of Engineers for this work.

b. Purpose

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

2. Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

3. Update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

Poquonock Reservoir Dam is located on Great Brook, immediately above the Poquonock River estuary, in the Town of Groton in southeast Connecticut. Poquonock Reservoir used to be named Groton Reservoir and at one time it was known as Borough Reservoir. The dam is situated in New London County north of the community of Poquonock Bridge, about 2 miles east of the City of Groton on U.S. Route 1. The dam is located so that its tailwater is only slightly above tidewater level.

b. Description of Dam and Appurtenances

1. Dam

Poquonock Reservoir Dam is a 285 ft. long stonewall-earth dam structure with a maximum height of about 12 ft. above natural ground surface, built across the valley at the junction of Great Brook and the Poquonock River. The ashlar masonry wall has a downstream face on a 1 to 15 batter, a 2 ft. top width and a stepped upstream face on a 1 to 4 batter. The height of the wall is about 15.5 ft. and its bottom width is 6 ft. The ratio of bottom width to height is 0.39 to 1. An earth embankment is placed against the upstream face of the masonry wall, with a top width of about 12 ft. and an upstream slope of about 2 to 1. Small stone riprap covers portions of the upstream slope. The upper portion of the upstream slope and the top of the embankment are sodded. Since no bedrock is evident in the area, it is assumed that the ashlar wall was placed entirely on an earth base. The depth of the footing is about 3 ft. below ground surface.

At the right end of the dam, the embankment turns about 70 degrees upstream for about 100 ft. to close off the low area on the left side of the reservoir bank. A paved area is provided to the right of this closure dike.

A sketch plan and cross section of the dam is delineated on Figure 1, Sheet D-1, Appendix D.

2. Spillway

A 90 ft. length of the ashlar wall and embankment at the left end of the dam is constructed about 3.25 ft. lower than the top of the remainder of the dam, to serve as a spillway. About 39.5 ft. of its 90 ft. length is occupied by four pier blocks 16 in. high, between which 3 bays of 19 in. high stoplogs are normally installed. A walkway across the spillway width, supported on the pier blocks, provides access for installation and removal of the three stoplogs. End retaining and guide walls are provided at each side of the spillway reach. The left wall measures 3'3" high above the spillway sill, while the right wall measures 3'5" above the sill. The footing depth of the walls into the upstream embankment is not known.

The area downstream from the spillway section is paved with large hand-laid riprap, for a distance of about 35 ft., which provides a relatively smooth, erosion-resistant channel into the downstream riverbed. The level of the riprap at its junction with the vertical wall is from 1 to 3 ft. below overflow sill level. Its level at the downstream end is about 11 ft. lower than that of the overflow sill. Beyond the riprap, a scour channel has been eroded about 5 or 6 ft. deeper than that at the end of the riprap. It is understood that the present riprap was added in 1968 to replace a rock-filled, wooden crib apron constructed at the toe of the dam. It is not known how deep the original channel was eroded at the base of the toe when the riprap was placed, whether the erosion was backfilled with earth or rock, or what the thickness of the present riprap is.

A cross section of the spillway is delineated on Figure 1, Sheet D-1, Appendix D.

3. Outlets

Except for the intakes into the pumping and filter plant, which are located to the right of the dam in the right abutment, no other outlets are operative at the dam. An open 20 in. cast iron pipe projects through the downstream face of the dam about 10 ft. below the top and about 10 ft. to the right of the right spillway guide wall. There is, however, no evidence of a control hoist on the reservoir side to the right of the spillway wing-wall. It is conjectured that a control gate either still exists at the inlet to the pipe, or that the gate has been removed and the pipe blocked off with earth or concrete.

A disused penstock intake structure is located at the upstream face of the dam, about 36 ft. left of the right end of the dam. Two penstock pipes lead from this intake through the dam to two old partially dismantled hydraulic turbines. These turbines are in an advanced stage of disrepair and the former pumping and filtration plants at the site have been all but abandoned. A 12 in. dia. bypass pipe also leads from the intake structure to the downstream channel. It was not ascertained whether releases could be made through these penstocks and the bypass pipe in the event of the need for an emergency evacuation of the reservoir.

c. Size Classification

Poquonock Reservoir Dam is about 12 ft. high, impounding an estimated 900 acre-ft. to spillway crest level and about 1,700 acre-ft. to the top of the dam. In accordance with the size and capacity criteria given in Recommended Guidelines for Safety Inspection of Dams, storage capacity governs and therefore the project is classified as intermediate in size.

d. Hazard Criteria

A breach failure of Poquonock Reservoir Dam or dike would release water down a 1,500 ft. reach of the Poquonock River upstream from the Boston Post Road U.S. Route 1 crossing, and then into the Poquonock River estuary. The Filter Plant, Sludge Pump Station, the Town of Groton Sewage Pump Station and other facilities of the Groton Department of Utilities, several small commercial establishments and a church near the Route 1 crossing, and the Route 1 highway bridge would be adversely affected by a large outflow from the reservoir. Consequently, Poquonock Reservoir Dam has been classified as having a significant hazard potential in accordance with the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

Poquonock Reservoir Dam is owned by the City of Groton, Department of Utilities.

f. Operator

Alfred C. Dion, Chief Engineer

Ronald G. Munro, Superintendent of Water Operations

Richard M. Stevens, Chief Operator, Filtration Plant

City of Groton
Department of Utilities
295 Meridian Street, P.O. Box 820
Groton, CT 06340

Telephone: (203) 445-8571

g. Purpose of Dam

The reservoir created by Poquonock Reservoir Dam serves as a head pond and equalizing storage facility for supplying inflows into the pumping and filtering facilities for the City of Groton's domestic water supply system. The Poquonock Reservoir is operated in conjunction with other storage facilities upstream, namely, the Smith Lake (previously Poquonock Lake) and Pohegnut Reservoirs on Hatching Brook and the Buddington Pond, Ledyard and Morgan Pond Reservoirs on Great Boook.

h. Design and Construction History

Except for a single plan of the proposed original dam, no information has been recovered regarding its design or construction, but the records show it as having been built in 1901. From appearances, the concrete cap at the spillway sill and the pier blocks were not a part of the original construction, but were added later, in all probability to permit installing the stoplogs so as to raise the reservoir level and reduce pumping head.

The heavy riprapping downstream from the spillway was added in 1968, presumably to fill an erosion pool created by a washout of the original wooden crib apron.

It is not known when the use of the turbines and the old pumping and filtration plant downstream from the dam was abandoned.

i. Normal Operational Procedure

The Poquonock Reservoir is operated in conjunction with other water storage facilities by the Department of Utilities personnel at the pumping and filter plant below the damsite. The plant is manned around the clock. There are formal documented operational procedures for the reservoir.

1.3 Pertinent Data

a. Drainage Area

The total drainage area above Poquonock Dam is about 14.2 square miles, being about 6½ miles long and a maximum of about 3½ miles wide. Poquonock Reservoir occupies about 1½ miles of the basin length and is fed by the meeting of Hempstead and Great Brooks from the north, and Hatching House Brook from the east. Storage reservoirs are sited upstream from Poquonock Reservoir on both the incoming streams, namely: Morgan Pond, Ledyard and Buddington Pond Reservoirs on Great Brook; and Pohegnut and Smith (Poquonock) Lake Reservoirs on Hatching House Brook. Sub-drainage areas to the various facilities are as follows:

1.	Above Morgan Pond Dam	3.80 sq. mi.
2.	Between Morgan Pond and Ledyard Dams	1.38 sq. mi.
3.	Great Brook below Ledyard Dam and above Buddington Pond	3.29 sq. mi.
4.	Hempstead and Beaver Brooks above Buddington Pond	2.83 sq. mi.
5.	Hatching House Brook above Pohegnut Dam	1.43 sq. mi.
6.	Great Brook above Poquonock Dam and below Buddington Pond	1.43 sq. mi.

A sketch of the drainage area showing the location of the reservoirs and streams is illustrated on Sheet D-2, Appendix D.

The topography of the drainage basin is generally rolling to mountainous wooded terrain, with several swampy areas along the Great Brook water course. The rim of the basin rises generally up to 200 ft. above the stream valley; Gungywamp Hill west of Thompson and Great Brooks rises steeply about 250 ft. above the valley floor. The longest unrestricted water course into the Poquonock Reservoir is the Thompson-Great Brook stream, measuring 4.6 miles, with an average slope of about 55 ft. per mile.

b. Discharge at Damsite

1. Outlet Works Conduits

As noted in Para. 1.2, no outlets are now operative at Poquonock Dam. Five low lift pumps are installed in the pumping plant drawing water from the reservoir, with a normal capacity of about 11 to 12 mgd (17 to 18.5 cfs) and with a maximum capability of 27 mgd (42 cfs) with all facilities operating.

2. Maximum Known Flood at Damsite

As noted in Section 5.1, the maximum flow recorded at the stream gaging station 800 ft. downstream from the dam was 464 cfs. on September 12, 1954.

3. Spillway Capacities

A spillway discharge curve has been prepared for the spillway as it presently exists. Separate and combined curves for spillway and for dam overtoppings are shown on Figure 2, Sheet D-3, Appendix D. Computations are shown on Sheet D-4. Pertinent discharges are as follows:

(a)	Spillway capacity to top of dam - El 25.25	
	- Stoplogs removed	1,160 cfs
	- Stoplogs in place	660 cfs
(b)	Spillway capacity at test flood elevation - El 27.75	
	- Stoplogs removed	3,075 cfs
	- Stoplogs in place	2,480 cfs
(c)	Total project discharge at test flood elevation - El 27.75	
	- Stoplogs removed	5,800 cfs

c. Elevations (ft. above MSL)

1. Streambed at centerline of dam 10.0±
2. Maximum tailwater - Unknown; may be affected by tidewater
3. Upstream portal invert diversion tunnel - Not applicable
4. Recreation pool - Not applicable
5. Full flood control pool - Not applicable
6. Spillway crest 22.00
7. Design surcharge - Not applicable
8. Top of dam - Left portion 25.25
   - Right portion 25.42
9. Test flood design surcharge 27.75

d. Reservoir

1. Length of maximum pool 8,500 ft.
2. Length of recreational pool - Not applicable
3. Length of flood control pool - Not applicable

e. Storage (acre-ft.)

1. Recreation pool - Not applicable
2. Flood control pool - Not applicable
3. Spillway crest pool - 900
   Spillway crest piers - 1,160
   Spillway stoplogs - 1,210
4. Top of dam - 1,660
5. Test flood pool - 2,490

f. Reservoir Surface (acres)

1. Recreation pool - Not applicable
2. Flood control pool - Not applicable
3. Spillway crest - 184
4. Test flood pool - 288
5. Top of dam - 243

g. Dam

1. Type - Stonewall-earth
2. Length - 285 ft.
3. Height - 12 ft.
4. Top width - 14 ft.
5. Side slopes - Upstream- 2 horizontal to 1 vertical
   Downstream- vertical
6. Zoning - Downstream - ashlar masonry stone wall
   Upstream - earth fill embankment
7. Impervious core - None
8. Cutoff - Unknown
9. Grout curtain - Unknown
10. Other - Nil

h. Diversion and Regulating Tunnel - None

i. Spillway

1. Type - Overflow section through top of dam
2. Length of weir - 90 ft. total, obstructed by 39.5 ft. of 16 in. high pier blocks
3. Crest elevation - Spillway sill - Elev. 22.00
   Top of pier blocks - Elev. 23.33
4. Stoplogs - 19 in. high installed on 50.5 ft. of spillway crest length
5. Upstream channel - Through top of dam
6. Downstream channel - Hand-placed riprap for distance of 35 ft. below dam.
7. General - Nil

j. Regulating Outlets

1. No outlets operative at dam
2. Pumping plant withdrawal from reservoir. Five low lift pumps with up to 42 cfs capacity.

SECTION 2 - ENGINEERING DATA

2.1 Design

The dam is said to have been designed and built about 1901. The only plan of record recovered shows a proposed design prepared by Daboll and Crandall, Engineers, New London, CT. This plan is on file with the City of Groton's Department of Utilities, Pocket 57, Folder 5, Plan 2. A copy is included in Appendix B.

In 1974 Metcalf and Eddy, Inc., Engineers, of Boston, MA, made a preliminary study and design of a scheme to enlarge the spillway and raise the dam, so that the facility could handle a flood inflow equal to that of a 1938 record storm, without an overtopping of the dam. A hydrological study, made by them in 1969 in this connection, used data from the record storm at a nearby drainage basin. The data was transposed to the Great Brook basin area and runoffs were estimated on the basis of CSM values gleaned from the transposed area criteria. This 1938 flood had an inflow estimated to be 30 percent of the test flood. Apparently, the proposed modifications were never carried out. A copy of this study is available from the State of Conn. Dept. of Environmental Protection.

2.2 Construction

It is not known by whom the construction was carried out in 1901 or thereabouts.

2.3 Operation

The facility is operated as a water supply storage and equalization reservoir by the City of Groton Department of Utilities, in conjunction with their pumping and filtration plant. There are formal operating procedures for the reservoir.

2.4 Evaluation

a. Availability

Insufficient information is available for an assessment to be made of the safety of the dam. The basis of the information presented in this report is principally the visual observations of the inspection team.

b. Adequacy

The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Validity

The validity of such engineering data as was acquired is considered acceptable and is not challenged.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection of Poquonock Dam and Reservoir, and of the associated storage facilities upstream, took place on 13 November 1978. At that time the reservoir was about 1 in. below the spillway crest level.

The facility is well tended by a staff from the adjoining pumping and water treatment plant, with reasonably good housekeeping on and near the dam insofar as vegetation control, grass cutting and general routine maintenance are concerned.

b. Dam

The alignment of the downstream face wall of the dam appeared to be straight, and although the dam is slightly higher at the right of the spillway than at the left, there was no evidence of unequal settlement or subsidence of the wall.

From an examination of the ashlar wall forming the downstream face of the dam, both open and mortar-filled joints were noted (Appendix C, Photo No. 1). It could not be determined whether the wall was originally laid up with mortared or unmortared joints, whether it is of massive cemented masonry construction, or whether it is simply a "stonewall" facing with uncemented joints, the latter having been common practice at the turn of the century. Seepage through the ashlar wall was minimal, with moist stone seeps in evidence in about four locations to the right of the spillway and along the face below the spillway (Appendix C, Photo No. 2).

In the area immediately downstream of the right end of the dam, the terrain was very marshy, with standing water 2 to 3 ft. deep in an ill-defined channel with no flow. It is not known whether this marsh originated from seeps through the downstream wall of the dam or from some other source.

The upstream slope of the embankment portion of the dam showed local evidence of erosion owing to wave action, where the slope was insufficiently covered with riprap. Some runoff erosion near the spillway masonry walls has occurred. Several muskrat burrows along the upstream slope of the dam were noted, but the maintenance staff felt that the once moderate infestation had been successfully eliminated.

The low dike extending upstream from the right end of the dam appeared to be stable, with the same deficiencies as noted at the main dam, such as erosion from wave action and lack of adequate riprap on the reservoir side.

c. Appurtenant Structures

1. Spillway

The three stoplogs were in place at the time of the inspection, but the reservoir was below the sill of the crest. The stoplogs are 16 ft. 4 in. long planks supported in slots in the piers. The stoplogs can be reached from the walkway bridge across the spillway. Their removal can be effected from the walkway by a "come-along" and fittings in the stoplog planks and in the walkway bridge (Appendix C. Photo Nos. 3 and 4). This walkway might tend to collect floating debris.

The area downstream from the spillway crest for a distance of about 35 ft. was covered with hand-laid riprap, which it is understood was placed in 1968 to replace a rock crib apron at the foot of the ashlar wall. The riprap stones were smoothly laid, some being up to about 4 square ft.in area. The bedding for this riprap could not be observed (Appendix C, Photo Nos. 5 and 6).

On the downstream face of the nearly vertical wall, below the concrete cap forming the spillway sill and the top of the riprap, there were about six seep areas. In the past, the maintenance staff has introduced bentonite into the fissures along the upstream face of the masonry wall to control this seepage. Joints have also been caulked with a "Hydrotite" compound.

Seepage was also observed near the right, center and to the left of the lower end of the riprap channel, estimated to be flowing at about 0.3 gpm, 0.5 gpm and 0.1 gpm, respectively.

Immediately upstream from the spillway channel, upstream from the pier blocks and on the left side, minor growths of cattails and bullrushes were noted.

2. Outlets

A 20 in. dia. outlet pipe was observed extending through the downstream wall about 10 ft. below the top of the dam and about 10 ft. right of the right spillway wall. No inlet structure or gate stem was visible on the upstream side of the dam in this vicinity. It is reasoned that this was originally a low level outlet which has deteriorated and has been abandoned.

The intake structure near the right end of the dam and the penstock pipes extending through the dam to two partially dismantled turbines also appeared to be in disuse, as was the old pumping station building immediately downstream. A steady stream of water, estimated at about 5 gpm, was flowing from beneath a broken 12 in. dia. pipe on the right side of the abandoned effluent channel downstream from the turbine platform. Inside the old pumping station building, audible sounds of running water below the floor were noted, being most noticeable near some old valves located near the generator room.

Withdrawal from the reservoir is made through the intake to the pump house about 100 ft. upstream from the right end of the dam, where five pumps are housed.

d. Reservoir Area

A swale or saddle area about 250 ft. wide was noted about 200 to 300 ft. left of the left end of the dam, which appeared to have its low point about 2 ft. below the top of the dam. This could only be verified by means of a survey, which is outside the scope of this inspection.

The reservoir banks are gently sloping and appear stable. The reservoir area is continually patrolled and maintained as a water supply preserve.

e. Downstream Channel

As noted in Section 1.2, water released from Poquonock Dam would flow into the estuary of the Poquonock River, a tidewater stream emptying into Long Island Sound. This estuary is crossed by U.S. Route 1 about 1,500 ft. below the dam and by the Penn Central Railroad about 1,500 ft. farther downstream.

The waterway under the Route 1 bridge consists of two arched openings, each of 10 ft. span and with about 6 ft. crown height above the water surface at the time of the inspection. Watermarks on the piers indicated that for some high tides the crown height is reduced to about 3.5 ft. The depth to river bottom was not ascertained.

The downstream channel between the dam and the highway bridge was rather heavily overgrown with vegetation and trees.

3.2 Evaluation

The visual inspection of the dam and its appurtenant structures revealed sufficient information to permit an assessment to be made of most of the features relating to the stability and integrity of the structures. The Poquonock Reservoir Dam and appurtenant works are judged to be in generally good condition.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

The Poquonock Reservoir Dam is operated by personnel of the Groton Department of Utilities, who are stationed around the clock at the filter plant and pumping station immediately below the dam. There is a manual of operations for the system of reservoirs, of which Poquonock Reservoir is the lowest. Semi-annual inspections are being performed at this dam.

4.2 Maintenance of Dam

Routine maintenance, involving growth removal and general housekeeping, is carried out by city personnel as needed. Periodically, seepage through the masonry downstream face of the dam is sealed off by means of Bentonite clay and proprietary compounds.

4.3 Maintenance of Operating Facilities

The only outlet through the dam known to be functioning is the intake to the pumps. It was not ascertained whether the abandoned penstock intake to the old pumping station, now in disuse, could be operated. The 20 in. dia. outlet pipe through the dam is inoperable. The bridge with "come-along" for removal of spillway stoplogs is adequately maintained.

4.4 Warning System

No formal warning system is in effect at Poquonock Reservoir Dam. An informal plan for emergency procedures, however, is known to key personnel, although not documented.

4.5 Evaluation

All existing outlets which could be utilized for evacuation of the reservoir in an emergency need putting into good working order. A formal flood warning plan should be developed from the existing informal plan for emergencies.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General

Poquonock Reservoir Dam is an 80 year old structure which combines a downstream ashlar stonewall and an upstream earthen embankment. The dam impounds about 900 acre-ft. of storage to spillway crest level and an additional 300 acre-ft. of controlled storage to the top of 19 in. high stoplogs which can be installed on the spillway crest. From spillway crest level to the top of the dam, the surcharge capacity for capturing flood inflows is about 760 acre-ft. of storage volume. The spillway capacity with the reservoir to the top of the dam and with the stoplogs removed is about 1,200 cfs.

The drainage area above Poquonock Reservoir covers about 14 square miles and contains several other reservoirs. For a major storm event, some of the runoff will be captured and temporarily withheld in the upstream reservoirs, depending on how full they are at the beginning of the storm. The amount of runoff which is not held back by the upper storages will enter Poquonock Reservoir, where it will either be stored in the surcharge space or passed over the spillway and dam. To ascertain the flood magnitude which can be handled by the facility, flood hydrographs need to be developed and flood routings made through the various storage facilities for a series of floods of different magnitudes, to determine surcharge and outflow amounts at Poquonock Dam.

The general topographic characteristics of the basin are best described as rolling to mountainous terrain, for which the March 1978 Preliminary Guidance for Estimating Maximum Probable Discharges (NED) gives a suggested CSM value for a 14 square mile drainage area of about 1,550 to 1,850. On this basis, without specifically considering upstream storage influences, peak inflow into Poquonock Reservoir would be estimated as 20,000 to 25,000 cfs. It may be expected that a considerable reduction in this magnitude of inflow would be effected by the upstream retarding impoundments. Nevertheless, with a spillway capability of only 1,200 cfs, it is apparent that the Poquonock facilities would be adequate to handle only a relatively small flood event before the dam would be overtopped.

The more detailed analysis given below was therefore performed to take into consideration more exact runoff characteristics along the upstream water courses, and the routing influences of the upstream storages, as they affect the Poquonock Reservoir inflow.

b. Design Data

No design data was recovered for this dam.

c. Experience Data

The maximum recorded flow at the stream gaging station 800 ft. downstream from Poquonock Reservoir Dam, known as "waste weir on Great Brook", was measured on September 12, 1954 at 464 cfs. This was the result of rainfall on the watershed on September 11, recorded as 6.15 in. at the water treatment plant weather station. Other major storms occurred in Connecticut in 1936, 1938 and 1955, but these were centered more inland or in western Connecticut and did not produce runoffs at Poquonock of the magnitude of those experienced in 1954 (Appendix B).

d. Visual Observations

No evidences to indicate possible high flows through the reservoir or in the downstream channel have been noted or recorded.

e. Test Flood Analysis

1. Drainage Areas

The 14.2 square mile basin drainage area above Poquonock Reservoir was divided into six sub-areas for the hydrologic and hydraulic analysis. A flood hydrograph was prepared for each sub-area and flood routings were conducted where flows passed through the reservoirs sited on the streams. These sub-areas, noting locations, drainage area size, water course lengths and stream slopes, and the sizes of the impoundments, are noted in Section 1.3 and are delineated and tabulated on Sheet D-2 in Appendix D.

2. Reservoir Areas and Capacities

Poquonock Reservoir at spillway crest level is reported to impound about 300 mg. or about 900 acre-ft. For determining reservoir surcharge capacity, planimetered areas were taken from contours delineated on the USGS 2,000 ft. per in. quadrangle sheets. Area-capacity curves for Poquonock Reservoir are shown on Figure 3, Sheet D-5. The computations for the area-capacities are shown on Sheet D-4.

For determining surcharge storages at the upstream reservoirs for use in flood routings, areas were planimetered and storages computed in a similar manner. Morgan Pond Reservoir areas and capacities are shown on Sheet D-6; Ledyard Reservoir areas and capacities are shown on Sheet D-7; and Pohegnut Reservoir areas and capacities are shown on Sheet D-8.

3. Outflow Discharge Capacities

For use in the flood routings of the inflows through the various impoundments, discharges were computed through the spillways and over the tops of the dams on the several reservoirs upstream. For Morgan Pond Dam these are shown on Sheet D-6; for Ledyard Dam on Sheet D-7; and for Pohegnut Dam on Sheet D-8.

4. Test Flood

Poquonock Reservoir Dam is about 12 ft. high and impounds about 1,700 acre-ft. to the top of the dam. As noted in Section 1.2c, it is therefore categorized as intermediate in size. As noted in Section 1.2d, the hazard potential is classified as significant. The Recommended Guidelines for Safety Inspection of Dams require that for hydraulic evaluation the dam adequacy be tested for a 0.5 PMF.

5. Precipitation Data

Precipitation data was obtained from Hydrometeorological Report No. 33, which for the southern Connecticut area approximates 24.7 in. of 6 hour point rainfall over a 10 square mile area. This value was reduced by 4 percent to apply to a 14 square mile total area, and by an additional 19.5 percent to conform to the area fit reduction criteria. The 6 hour rainfall was distributed into ½ hour incremental periods as suggested in COE Publication EC-1110-2-1411. Infiltration losses of 1 in. during the first hour and 0.2 in. during each succeeding hour were assumed. The net rainfall excesses for developing the runoff hydrographs are shown on Sheet D-9, Appendix D.

6. Drainage Basin Criteria

In order to evaluate the sub-drainage basin characteristics for lag and transport times, needed to develop the sub-basin hydrographs and upstream reservoir outflow patterns, stream profiles were plotted from the USGS quadrangle sheets. These profiles are shown on Figure 4, Sheet D-10. Stream lengths for each sub-basin were evaluated for time-of-concentration, lag time and average flow velocities. The resulting values are recorded on Sheets D-11 and D-12. A weighted average equivalent flow velocity within the various basins is about 0.9 ft. per sec. and transport velocity between sub-basins is about 1.1 ft. per sec.

7. Selected Unitgraph

The unitgraph used for developing the various sub-basin inflow hydrographs is the curvilinear adaptation of a triangular unitgraph, shaped as described in Design of Small Dams. These unitgraphs for the variously adopted time-to-peak values selected for the differing sub-basins are shown on Sheets D-13 and D-14.

8. Runoff Hydrographs and Flood Routings

Runoff hydrographs were prepared for each of the sub-areas selected, after which they were appropriately routed through Morgan Pond, Ledyard and Pohegnut Reservoirs, to form the inflow hydrograph into Poquonock Reservoir. This inflow hydrograph was then routed through Poquonock Reservoir to ascertain reservoir outflows and surcharge storage encroachments.

Sub-basin hydrograph printouts and flood routings prepared using the COE HEC-1 computer program are shown on Sheets D-15 to D-89, incl. Sheets D-15 thru D-36 show the various 0.5 PM test flood runoff hydrographs and flood routings for determining the inflow into Poquonock Reservoir. The peak inflow for the test flood is 6,683 cfs. Sheets D-37 and D-38 show flood routing results at Poquonock Reservoir Dam. Sheets D-40 thru D-64 are hydrographs and flood routings for a 0.2 PMF runoff. Sheets D-65 thru D-89 are hydrographs and flood routings for a 0.1 PMF runoff.

Flood routing results for the Poquonock Reservoir, as determined from the above calculations, are as follows:

Flood Magnitude	Maximum Surcharge Elevation MSL	Maximum Outflow From Reserv. cfs	Maximum Outflow Thru Spillway cfs	Maximum Outflow Over Dam cfs	Outflw Per Ft Over Dam cfs	Total Volume Over Dam A-F	Max. Depth Of Dam Over-Topping ft
0.5 PMF	27.75	5,813	3,074	2,739	10.7	1,678	2.5
0.2 PMF	25.74	1,663	1,484	179	0.7	138	0.5
0.1 PMF	24.40	668	668	0	0	0	0

In calculating the outflow over the dam, it has been assumed that the saddle to the left of the dam would not be overtopped.

From the above, it can be seen that the dam will be overtopped for inflows in excess of about 0.15 PMF. On this basis, the dam and spillway are judged to be adequate to accommodate only about 30 percent of the test flood.

It should be noted that, in the flood routings through the Poquonock Reservoir Dam spillway, the spillway outflow conditions were assumed to be with the stoplogs removed and with the reservoir storage at the sill of the spillway crest at the start of the routing. In the event that the stoplogs were in place and the storage was within the surcharge space at the start of the flood, the facility would not be able to handle the flood magnitude indicated.

f. Dam Failure Analysis

1. Spillway Adequacy

The spillway crest is considerably constricted by the wide pier blocks. If they were to be removed and replaced by thinner piers, spillway outflow capacity would be substantially increased. It is estimated that, if the existing blocks were replaced with about five one-foot-wide piers, with the reservoir to the top of the dam, the spillway discharge would increase by about 25 percent.

The riprapped slope downstream from the spillway crest appears adequate to accommodate a considerable overflow without being washed away. However, no anchoring protection appears to have been provided at the toe of the slope to forestall an undermining and subsequent loss of the riprap from that cause. The scouring velocities at the end of the riprap for higher spillway outflows are estimated to be up to 25 ft. per sec., which would undoubtedly cause a severe scour and the erosion of a deep hole at the end of the riprap. Once the riprap was undermined and washed away, erosion to the very toe of the downstream ashlar masonry wall could occur. The wall could then be undermined, and the integrity of the entire dam threatened, even though the dam might not be overtopped.

2. Breach Failure of Dam

A breach with the reservoir level at the top of the dam would release a flood wave to the valley downstream. The rule of thumb criteria suggested in the NED March 1978 Guideline Report would be applicable, assuming a trapezoidal gap with a 50 ft. bottom width and 1.4 to 1 slopes, eroded to a 12 ft. depth measured from the top of the dam. The outflow through this gap would be approximately 5,000 cfs., which when added to the spillway discharge of 1,000 cfs., will produce a flood flow of 6,000 cfs. in the downstream channel (see computations on Sheet D-90).

3. Downstream Channel

The conditions in the river channel downstream from Poquonock Dam are discussed in Section 1.2d and 3.1e. If not already washed out by spillway outflows with surcharge heads below the top of the dam, the U.S. Route 1 bridge would be expected to be overtopped and washed away owing to a flood surge from a breach in the dam. The Penn Central Railroad crossing over the Poquonock River would also be threateded. The filter plant, sludge pump station, sewage pump station and other facilities of the Groton Department of Utilities would be within the affected area, with possible flood depths of about 5 ft. The church and several small commercial establishments in the vicinity of the Route 1 bridge would also be similarly affected.

Delineated on Sheet D-91 in Appendix D is the area which could be flooded by a breach failure of the dam (quad sheet graphic).

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

The field investigations of the embankment revealed no significant displacement or distress which would warrant the preparation of slope stability computations based on assumed soil properties and engineering factors.

Although the ashlar masonry wall joints appear to be mortared and the dam was probably built as a masonry retaining wall, it is by no means certain from visual observations that this is the case. The wall may have been laid up as a "stonewall" with open jointing. The ratio of base width to wall height as shown on the original design drawing is only 0.38 to 1, which for a wall founded on earth would be unstable under hydrostatic loading.

Nevertheless, while the design is not necessarily in accord with modern standards, the successful performance history since the turn of the century does indicate that the design and construction were adequately performed.

b. Design and Construction Data

No design data appears to exist for this dam construction in 1901, and the only plan of record is that by Daboll and Crandall, Engineers of New London, CT. The plan indicates that the present configuration was superimposed on an earlier dam, the key addition being the stepped masonry wall and the upstream embankment. No information on foundations, other than that on the 1901 plan, is available. It is not known with certainty whether the dam was built in accordance with this plan.

c. Operating Records

Operating records are maintained by the City's Utilities Department personnel at the administration center of the filtration plant complex, adjacent to the dam site.

d. Post Construction Changes

Subsequent to the original construction, a new filtration plant complex was constructed, and the original facilities abandoned. It is understood that the heavy riprap on the spillway discharge apron was placed in 1968, replacing a dislodged rock crib apron. While neither of these changes adversely affect dam stability, the persistent and fairly heavy leakage through the abandoned plant requires attention (see Section 7).

e. Seismic Stability

The dam is located in Seismic Zone No. 1, and, in accordance with Phase I guidelines, does not warrant seismic analysis.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

On the basis of the Phase I visual examination, the Poquonock Reservoir Dam appears to be in good condition and functioning adequately. The deficiencies revealed indicate that additional investigations should be undertaken and that some additional maintenance work is also needed. The spillway will only pass about 30 percent of the 0.5 PMF test flood without overtopping the dam.

The riprap on the upstream embankment face does not extend up into the area affected by wave action, which has resulted in erosion of the slope. There is also some embankment erosion near the spillway inlet walls. Excessive brush and marsh growth is found both upstream of the spillway and in the downstream channel. There are several minor seepage locations through the face of the masonry dam and the downstream riprap, and some more serious leakage through an abandoned treatment plant and pumping station. The only operative outlet from the reservoir is the intake to the pumps.

b. Adequacy of Information

The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Urgency

The recommendations and remedial measures enumerated below should be implemented by the owner within one year after receipt of the Phase I Inspection Report.

d. Need for Additional Investigations

Additional investigations are required as recommended in Para. 7.2.

7.2 Recommendations

It is recommended that the owner should retain the services of a competent registered professional engineer to make investigations and studies of the following, and if proved necessary, to design appropriate remedial works:

1. Investigate the construction of the downstream masonry face-wall and perform a structural stability analysis to determine the safety of the dam under flood surcharge loadings.

2. Review spillway outlet channel flow conditions and determine whether modifications are required to forestall a possible undermining of the riprap slope.

3. Determine the elevation of the swale 200-300 ft. east of the dam and evaluate any impacts on flood outflows from the reservoir.

4. Review all previous studies for raising the dam and making alterations to the spillway. Determine whether the ability of the facility to handle higher inflows should be improved.

5. Determine whether existing outlet facilities are adequate for reservoir drawdown under emergency conditions.

7.3 Remedial Measures

a. Operating and Maintenance Procedures

   1. The stoplogs on the spillway should be immediately removed and left removed until all the above recommendations and all other remedial measures have been implemented.

   2. The erosion of the upstream embankment slope by wave action should be repaired and protected by new riprap extended at least to the upper limits of the eroded area.

   3. Scoured areas of the embankment adjacent to the [illegible] walls should be repaired.

4. Brush and marsh growth should be removed, both from the downstream channel and from the area upstream of the spillway.

5. Seepage through the face of the dam, and at the downstream toe of the riprap slope below the spillway, should be monitored once per month for changes in turbidity and volume.

6. The serviceability of all reservoir outlets now in disuse should be checked and, if possible, they should be made operable for emergency evacuation purposes.

7. The source and path of the leakage through and around the abandoned filter plant and pumping station should be investigated and, if possible, the leakage should be stopped. The leakage should be monitored for changes once per month.

8. The dam should be monitored monthly for new muskrat burrows and steps taken to eliminate any infestations which may occur.

9. A formal surveillance and flood warning plan should be developed from the present informal plan.

10. The current practice of having semi-annual technical inspections of the dam and appurtenant works should be continued.

7.4 Alternatives

The only appropriate alternative to these recommendations appears to be to operate the reservoir at lower levels so as to provide more storage for extreme flood events.

APPENDIX A

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION
PHASE I

Identification No. 00231 Name of Dam: Poquonock Dam

Date of Inspection: 13 November 1978

Weather: partly cloudy Temperature: 45°F

Pool Elevation at Time of Inspection: 21.9

Tailwater Elevation at Time of Inspection: Variable (tidal)

INSPECTION PERSONNEL

Pasquale E. Corsetti	Louis Berger & Associates, Inc.	Acting Project Manager
Carl J. Hoffman	Louis Berger & Associates, Inc.	Hydraulics, Structures
Thomas C. Chapter	Louis Berger & Associates, Inc.	Hydrology, Soils
James H. Reynolds	Goldberg Zoino Dunnicliff & Assoc., Inc.	Soils

OWNER'S REPRESENTATIVE

Ronald Munro	Superintendent of Operations, Water & Pollution Control, Dept. of Utilities	City of Groton
George Merceron	Reservoir Patrolman	City of Groton

VISUAL INSPECTION CHECKLIST

Identification No.: CT 00231 Name of Dam: Poquonock Dam Sheet 1

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
<u>EMBANKMENT</u> Vertical alignment and movement	Alignment good; no movement observed. A 250 ft. wide section of reservoir shore 300 ft. east of dam is about 2 ft. lower than crest of dam.
Horizontal alignment and movement	Alignment good; no movement observed.
Unusual movement or cracking at or near the toe	None
Surface cracks	None
Animal burrows and tree growth	Rodent burrows on upstream slope, right of spillway. City staff say colony has been eliminated. Heavy growth in downstream channel. Marsh growth upstream of spillway.
Sloughing or erosion of slopes	Upstream face eroded above limit of riprap by wave action.
Riprap slope protection	Riprap is too small and does not extend high enough up face of dam. Condition is fair.

VISUAL INSPECTION CHECKLIST

Identification No.: CT 00231   Name of Dam: Poquonock Dam   Sheet 2

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Embankment - cont. Seepage	Seepage locations at toe of downstream riprap and through abandoned filtration plant.
Piping or boils	None
Junction of embankment and abutment, spillway and dam	Some erosion of embankment behind spillway side walls.
Foundation drainage	None
OUTLET WORKS Approach channel	None
Outlet conduit concrete surfaces	Fair condition.
Intake structure	Concrete lined intake to pump house, with skimmer. Five low lift pumps (11-12 mgd, 27 mgd maximum possible).
Outlet structure	No outlet except thru pumps to filter plant.

VISUAL INSPECTION CHECKLIST

Identification No.: CT 00231 — Name of Dam: Poquonock Dam — Sheet 3

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
<u>Outlet Works</u> - cont. Outlet channel	None
Drawdown facilities	None except through pumphouse. Penstocks in old abandoned intake probably unserviceable. 20 in. dia. outlet pipe appears to have no control and to be plugged.
<u>SPILLWAY STRUCTURES</u> Concrete weir	Stepped concrete weir with stoplog slots; condition fair to good.
Approach channel	None
Discharge channel	Heavy hand placed riprap (1968) in natural stream channel.
Stilling basin	None
Bridge and piers	Timber walkway on steel supports over sill for access to stoplogs.

VISUAL INSPECTION CHECKLIST

Identification No.: CT 00231 Name of Dam: Poquonock Dam Sheet 4

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Spillway Structures - cont. Control gates and operating machinery	3 stoplogs, each 16' - 4" long by 19" high, can be removed by "come-along" and fittings on walkway.
INSTRUMENTATION Headwater and tailwater gages	None
Embankment instrumentation	None
Other instrumentation	None
RESERVOIR Shoreline	Gentle slopes, heavily wooded, stable.
Sedimentation	None observed.
Upstream hazard areas in event of backflooding	None
Alterations to watershed affecting runoff	Gravel removal operations in whole area between reservoirs.

VISUAL INSPECTION CHECKLIST

Identification No.: CT 00231 | Name of Dam: Poquonock Dam | Sheet 5

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
DOWNSTREAM CHANNEL Constraints on operation of dam	None
Valley section	Wide natural valley, emptying into tidal estuary of Poquonock River.
Slopes	Gentle slopes
Approximate number of homes/population	None
OPERATION & MAINTENANCE FEATURES Reservoir regulation plan, normal conditions	Daily records are kept by plant personnel of reservoir inflow.
Reservoir regulation plan, emergency conditions	None
Maintenance features	General housekeeping maintenance by Water Dept. staff.

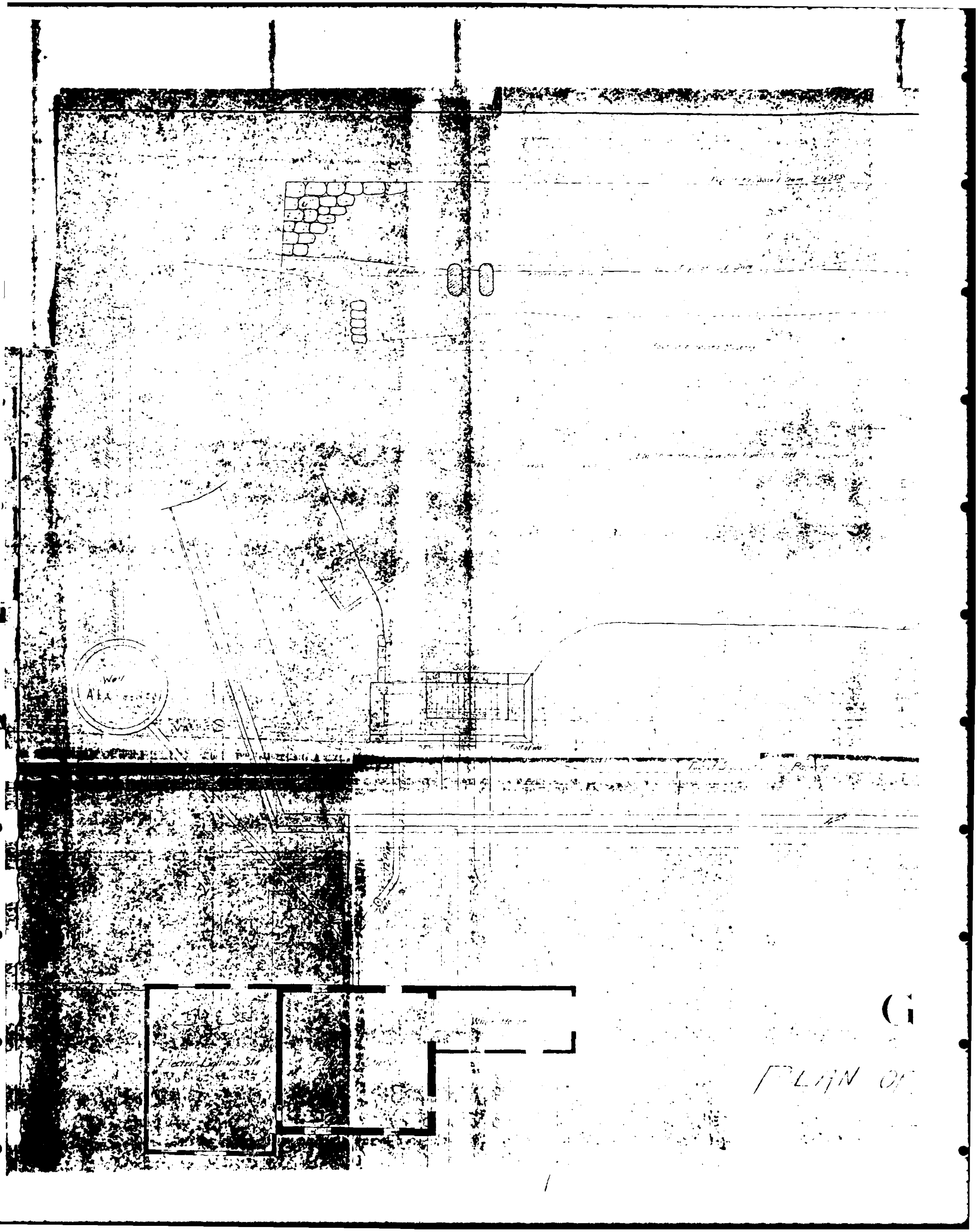
VISUAL INSPECTION CHECKLIST

Identification No.: CT 00231 | Name of Dam: Poquonock Dam | Sheet 6

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
<u>MASONRY DAM</u> Seepage or leakage	Several seepage locations through d/s masonry face: 6 places below spillway; 10 ft. right of right spillway wall about 6 ft. below crest.
Structure to abutment/embankment junctions	No problems observed - built into earth abutments.
Drains	None
Water passages	20 in. dia. outlet pipe, disused and apparently plugged.
Foundation	Unknown, probably earth.
Surface cracks	Joints between masonry blocks partly mortared, partly open.
Vertical and horizontal alignment	Alignment good, no movement observed.

APPENDIX B

PLANS, RECORDS & PAST INSPECTION REPORTS


Well
Electric Lighting Sta
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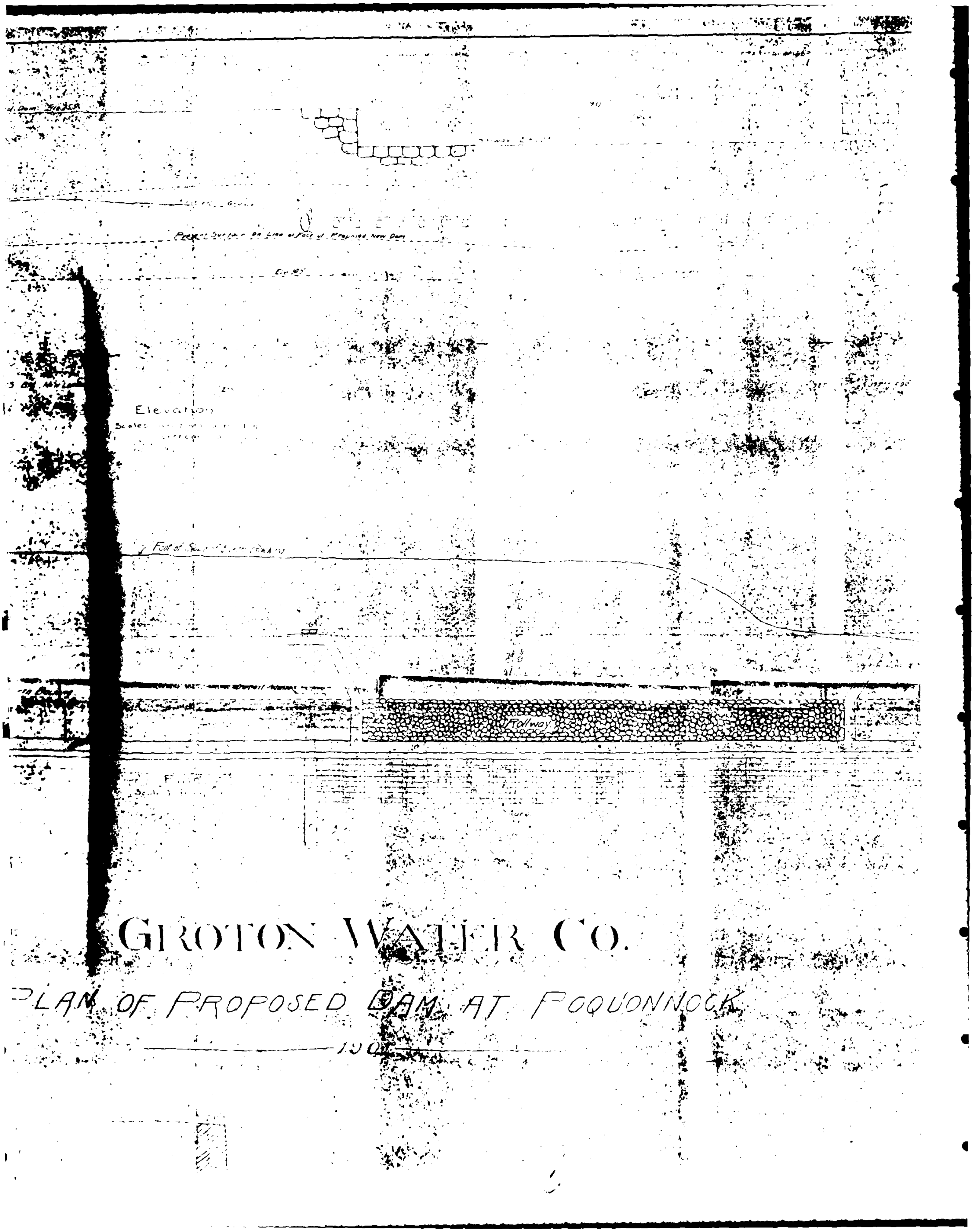
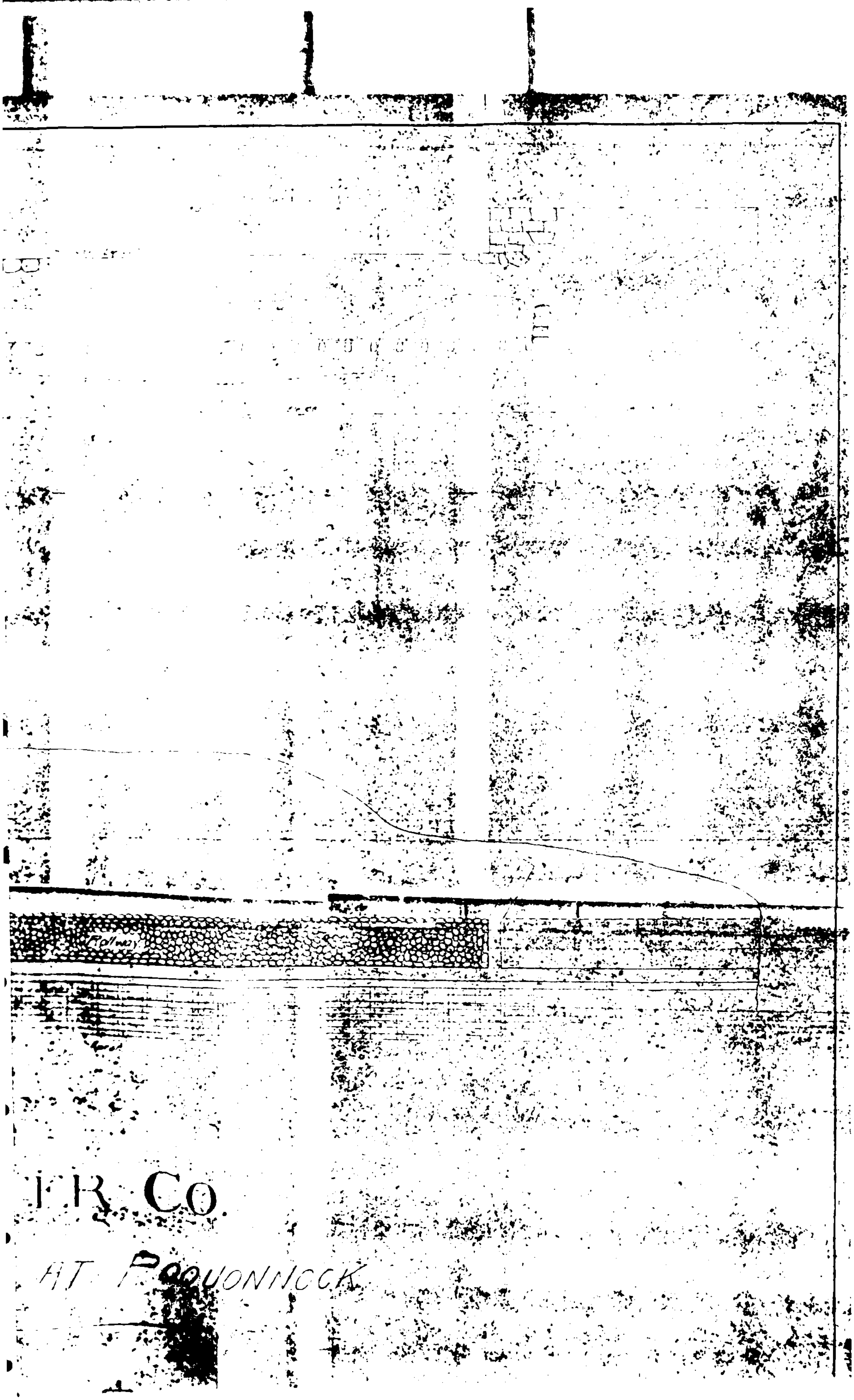
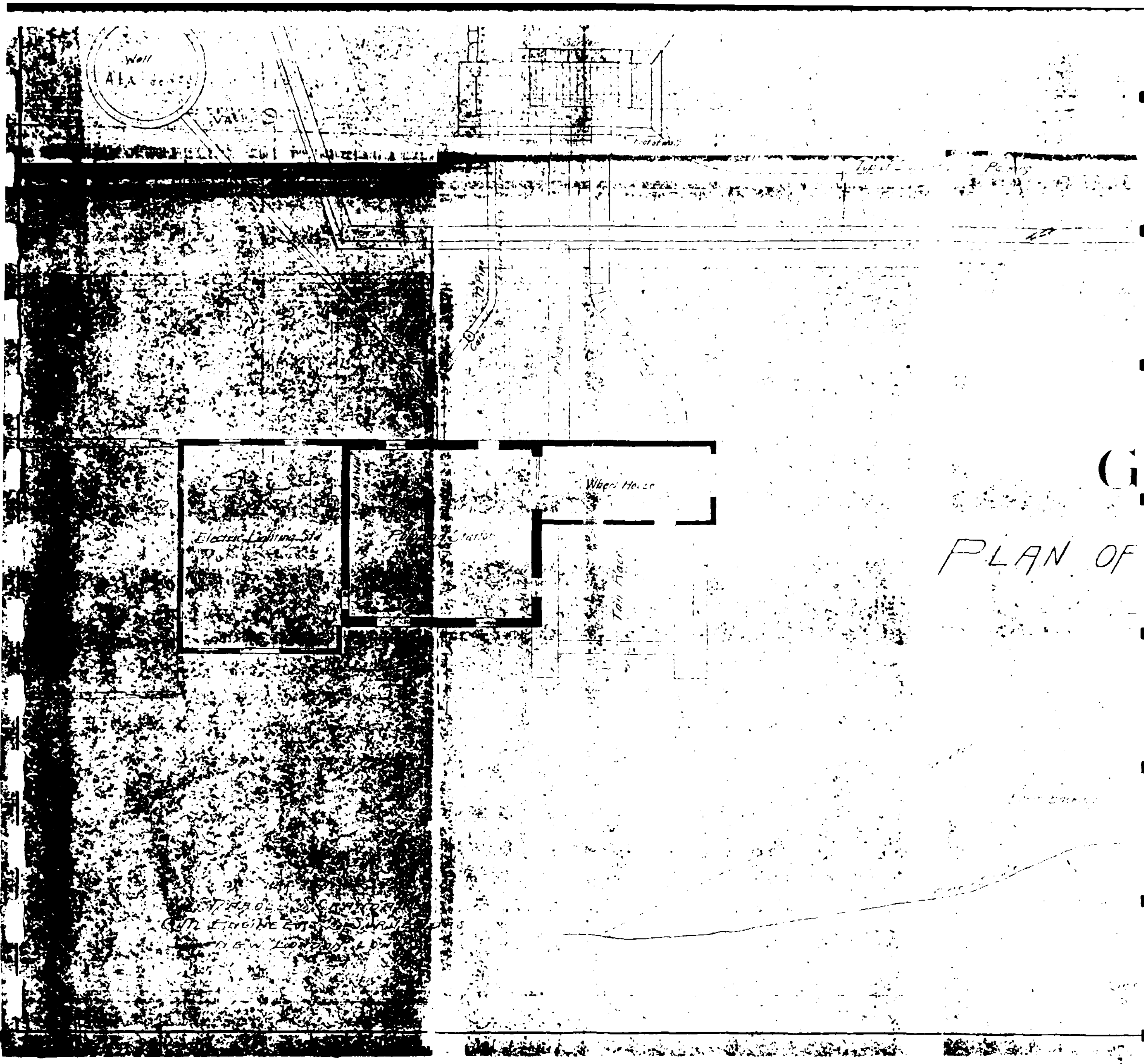
PLAN OF

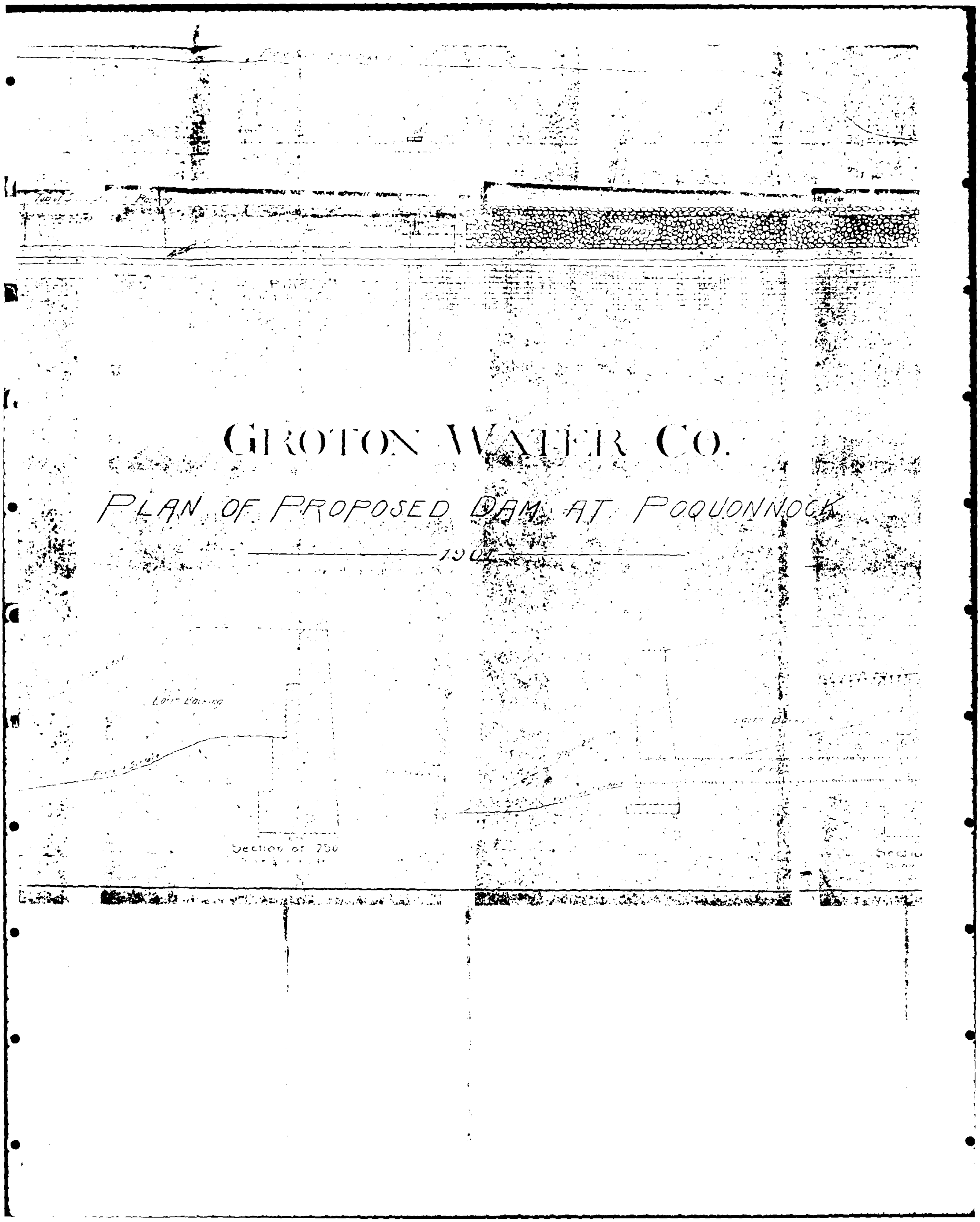


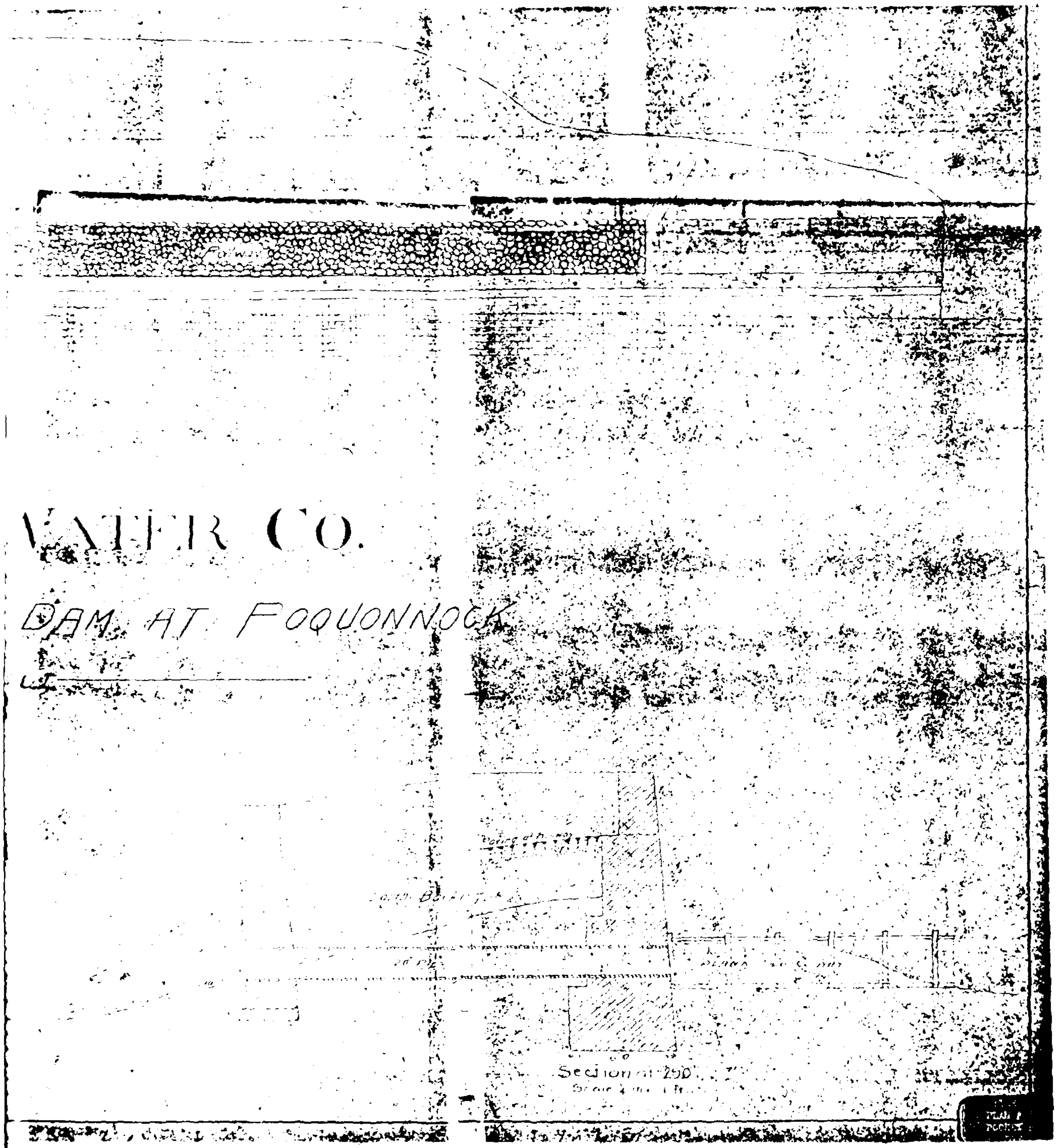
Present Surface On Line of Foot of Proposed New Dam
Elevation
Rollway
GROTON WATER CO.
PLAN OF PROPOSED DAM AT POQUONNOCK


Rollway
ER Co.
AT POQUONNOCK



Well
Wheel House
Electric Lighting Sta
Tail Race
G
PLAN OF


GROTON WATER CO.
PLAN OF PROPOSED DAM AT POQUONNOCK
Rollway
Earth Backing


VATER CO.
DAM AT POQUONNOCK
Section at 290

Date: October 23, 1978

City of Groton
Department of Utilities
Reference Plan Number
Pocket 57
Folder 5
Plan 2

DAMS, DIKES, AND EMBANKMENTS QUESTIONNAIRE

Insured: The City of Groton, Department of Utilities

295 Meridian Street, P. O. Box 820

Groton, Connecticut 06340

Name of Dam: Poquonnock Reservoir Dam

Location of Dam: Town of Groton, Connecticut

THE DAM OR STRUCTURE

1. By whom designed Only Plan of Record (Proposed plan done by Daboll and Crandall Engineers, New London, Connecticut)
2. By whom constructed Unknown
3. Year constructed 1901
4. Type:
   (a) Earth with or without riprap facing ______
   (b) Earth with concrete core wall (with or without riprap facing) ______
   (c) Concrete ______
   (d) Other Mortar rubble face with impervious backing
5. Size:
   (a) Length 350 feet
   (b) Height 15 feet
   (c) Width at base 25 feet
   (d) Width at top 10 feet
6. Anchorage:
   (a) How are wings of dam secured (built into rock ledge, earth hillside, etc.)
   Built into earth hillside
   (b) Foundation under dam (founded on rock, earth, width, etc.)
   Founded on earth

7. Water Impounded:

(a) Area 139 acres or 0.22 square mile

(b) Average depth 15 feet

(c) Depth at spillway 2 feet

(d) Depth at dam 15.5 feet

(e) Water supply:

1. River

2. Spring

3. Other Great Brook watershed - approximately 15.4 square miles

(f) Length of time to refill Varies with seasonal precipitation

1. Approximate area of water used Usable storage capacity - 300 million gallons or 921 acre-feet

(g) What is the water used for Public water supply reservoir

8. Control:

(a) Gates: None. Removable flashboards only.

1. Size Three (3) flashboards 19 inches by 16 feet four inches

2. Number Three (3)

3. Location with respect to bottom of dam Spillway elevation - 22.00 mean sea level; Top of flashboards - 23.60 mean sea level

(b) Diversion tunnels: None

1. Number N/A

2. Size N/A

(c) Spillway:

1. Size 90 feet

2. Elevation with top of dam Spillway elevation: 22.00 mean low water; Dam elevation: 25.50 mean low water.

CONDITION

1. Maintenance, inspection, and operation Semi-annual inspections conducted. Preventive maintenance performed as required.

2. Erosion or deterioration of dam structure None

3. Seepage through dam Yes.

   (a) Give location and approximate amount Various locations. Appears to be minimal.

4. Use made of property bordering ~~lake~~ reservoir area Watershed Protection Utility Storage Yard, Water and Electric Operations Buildings, and Water Treatment Low Lift Intake Pump Station.

   (a) How affected by lowering of water level Water supply intake located on this reservoir.

PUBLIC EXPOSURE AT DAM SITE

1. Road across dam No

2. Is public allowed access to dam No

3. Is supervision maintained full time Daily reservoir patrols maintained

CONDITIONS DOWN STREAM FROM DAM

1. Slope of land from base of dam down stream 50 horizontal to 1 vertical

2. Give width of valley or gorge below dam 120 feet

3. Does spillway discharge into this valley, gorge, or river bed River bed

4. Number of bridges that might be affected by flood conditions should dam rupture One (1)

(a) Give size and stability of structure:

Route 1 highway bridge over Poquonnock River.
Span: 27 feet; clearance height: 6 feet.
Concrete encased steel I-beams with twin stone rubble masonry arches.

5. Buildings and structures that would be affected by dam failure (power plants, piers, etc.):

Filter Plant Sludge Pump Station and Town of Groton Sewage Pump Station

6. Dams, weirs, and flood gates in stream bed which might be affected by dam failure:

   (a) Size

   (b) Distance from dam in question

   Poquonnock Reservoir Dam weir

   (a) Size: 22 feet.

   (b) Distance from dam in question: 0.05 mile.

BOROUGH OF GROTON, CONNECTICUT

WEATHER AND WATER SUPPLY DATA

OBSERVATIONS AT WATER TREATMENT PLANT (EXCEPT AS NOTED) MONTH OF September 1954

DAY OF MONTH	AIR TEMPERATURE, DEG. F		BAROMETER, INCHES OF MERCURY		RELATIVE HUMIDITY	WIND	SKY	PRECIPITATION, INCHES		FLOW PAST WASTE WEIR ON GREAT BROOK. HUNDREDS OF CUBIC FEET.-WATCH BEGINING			ELEVATION OF WATER SURFACE BASED ON MEAN LOW WATER	
	HIGH	LOW	7:00 A.M.	7:00 P.M.	12:00 NOON			LIQUID	SNOW	12:00 MID.	8:00 A.M.	4:00 P.M.	BOROUGH RESERVOIR	SMITH LAKE
1	84	62	30.06	30.11	69	SW	Cloudy	0		80,064	86256	89568	22.57	24.72
2	91	52	30.16	30.10	69	SE	Clear	0		92880	99936	99936	23.14	24.66
3	82	60	30.07	30.00	82	SSE	Cloudy	0		106992	134640	147600	23.43	24.63
4	94	60	30.18	30.24	65	NNW	Partly cloudy	0		175680	135616	195984	23.55	
5	91	55	30.31	30.13	74	SSW	Partly cloudy	0		190800	185616	175680	23.55	
6	97	61	30.15	30.20	62	NNW	Clear	0		175680	175680	147600	23.51	24.54
7	86	60	30.23	30.08	74	SSW	Cloudy	.46		156528	156528	138816	23.44	
8	87	64	30.04	30.10	83	S.	Cloudy	.06		151920	147600	138816	23.40	24.56
9	83	58	30.19	30.26	78	NNW	Cloudy	0		156528	147600	134640	23.40	
10	80	56	30.25	30.10	72	NE	Cloudy	0		134640	126288	134640	23.35	24.53
[redacted]														
12	83	46	30.14	30.28	60	NW	Clear	0		20,000,000 EST.			[illegible]	25.15
13	78	43	30.43	30.34	63	SSE	Clear	0		485280	461600	273744	23.30	24.80
14	82	50	30.27	30.35	77	SSW	Cloudy	.88		273744	257328	194832	23.21	
15	65	45	30.44	30.43	58	ENE	Cloudy	.02		191088	183888	109224	23.12	24.13
16	61	51	30.41	30.27	75	ENE	Cloudy	.94		111628	119736	125280	23.34	
17	60	52	30.19	30.18	80	NNW	Cloudy	.03		128232	189216	182016	23.48	24.00
18	73	48	30.18	30.14	73	NNW	Cloudy	0		180288	173088	166176	23.40	
19	64	54	30.09	29.79	75	SE	Cloudy	.33		176688	153072	140448	23.28	
20	76	58	29.78	29.77	85	SSE	Cloudy	.16		141710	140832	140083	23.25	23.90
21	81	48	29. 0	29.77	71	WNW	Cloudy	.04		137102	134078	128232	23.17	
22	79	52	29.75	29.91	62	WSW	Partly Cloudy	T		128232	128232	123840	23.14	23.86
23	76	44	30.13	30.17	62	SW	Partly Cloudy	0		122414	121132	973152	[illegible]	
24	86	37	30.33	30.28	62	NNW	Clear	0		973152	973152	443083	23.11	23.82
25	70	42	30.25	29.97	71	SSE	Cloudy	0		443083	495216	505440	23.26	
26	88	49	30.[illegible]	29.87	71	SSW	Partly Cloudy	.14		514656	533664	533664	23.40	
27	86	44	29.91	30.02	62	WNW	Partly Cloudy	0		551376	551376	722304	23.51	23.80
28	87	44	30.03	30.06	77	SSW	Clear	0		722304	699984	699984	23.49	
29	81	54	30.33	30.35	60	ESE	Clear	0		699984	677376	572688	23.44	23.78
30	83	62	30.37	30.2	86	SSE	Cloudy	0		572688	572688	572688	23.40	
31														
TOT.								8.41		TOTAL CU. FT. FOR MONTH				
AVER					72					OVER WEIRS*- 103,411,936=				
MAX										773,521,281 GALS.				
MIN.														

REMARKS: *Changecd to E.S.T.

Sept.11 Winds of hurricane force and Torrential rains damaged bldgs, trees, power lines and boats in this area

Low barometer reading on 11th 28.94 at 1:30 P.M.

Spillway of Borough Dam at El 22.16 based on Mean Low Water

WEIRS		HGHT.	FLO. CU. FT.
12 P.M.	10" =	96.4 =	138,816
8 A.M.	11" =	122.0	175,680
4 P.M.			8,000,000 Est.
TOTAL CU. FT./DAY =			8,314,496

2 STOP LOGS REMOVED FROM SMITH LAKE SLUICE WAY @ 5:30 P.M.
SMITH LAKE EL.- 25.30

TEMP.	WIND	SKY	RAIN
70-60	N.N.W.	RAIN	6.15

6.15" Inches rain fall
[illegible]
All Three [illegible] raised
at 11:00 AM.
No accurate measurement for
Weirs

6:00 P.M. - 1" FLO OVER WING WALL AT WEIRS
" - 52" FLO. THROUGH WEIRS.

Brook over-flowing at east [illegible]
[illegible] at Seeboge dam

[illegible] P.M.

Hemst 2.4 + EE = 5500 [illegible]
Great B. 4.3 + EE = 10000 [illegible]
[illegible] Brook 2.0 = 1,934 [illegible]
17,[illegible]

WEIRS	HGHT.	FLO. CU. FT.
12 P.M.		
8 A.M.		
4 P.M.		
TOTAL CU. FT./DAY:		20,000,000 EST

SMITH LAKE EL.- 25.15 — 121 M.G.
POHEGANUT RES. EL.- 34.95 — 138 M.G.
BUDDINGTON POND — 20 M.G.
POQ. RES. EL. 23.90 — 226 M.G.
505 IN STORAGE

TEMP.	WIND	SKY
83-46	N.W.	CLEAR

4'-7½" FLO. THROUGH WEIRS AT 10:15 A.M. (55½").
4'-3⅞" " " " 4:00 P.M. (51⅞")
6" Flo over wing wall at Weirs
at 12:00 P.M.
1¾" FLO OVER WING WALL AT WEIRS @ 10:15 A.M.
Brook over flowing at east side of Weirs
OBS. WELLS @ 10:15 A.M.

1	2	3	4	5
11.60	14.80	9.32	11.12	15.18
TIDE GAGE	7	8		
9.02	18.12	15.43		

Weirs at Great Brook & Hemsted Brook partially washed out. Figure for these Streams are Estimated
177,795,100 GALS./DAY Estimated

WEATHER AND WATER SUPPLY DATA

OBSERVATIONS AT WATER TREATMENT PLANT (EXCEPT AS NOTED) MONTH OF August 1955

DAY OF MONTH	AIR TEMPERATURE, DEG. F		BAROMETER, INCHES OF MERCURY		RELATIVE HUMIDITY	WIND	SKY	PRECIPITATION, INCHES		FLOW PAST WASTE WEIR ON GREAT BROOK. HUNDREDS OF CUBIC FEET.-WATCH BEGINING			ELEVATION OF WATER SURFACE BASED ON MEAN LOW WATER	
	HIGH	LOW	7:00 A.M.	7:00 P.M.	12:00 NOON			LIQUID	SNOW	12:00 MID.	8:00 A.M.	4:00 P.M.	BOROUGH RESERVOIR	SMITH LAKE
1	98	70	30.17	30.02	87	SSW	Clear	0		25,200	25,200	22,176	19.24	23.97
2	102	64	29.97	29.98	73	NNW	Clear	.04		22,176	23,472	22,176	19.12	
3	90	62	30.09	30.11	42	SSE	Clear	0		22,176	20,592	20,592	19.02	23.95
4	90	66	30.17	30.13	79	SSW	Cloudy	0		20,592	20,592	19,296	18.98	
5	100	70	30.11	30.00	80	SSE	Clear	0		19,296	20,592	18,000	18.78	23.90
6	98	70	30.10	30.14	69	SE	Clear	0		19,296	20,592	18,000	18.66	
7	89	72	30.03	29.97	84	SSE	Cloudy	.16		19,296	19,296	19,296	18.56	
8	83	55	30.03	30.19	70	NNE	Cloudy	.81		19,296	19,296	19,296	18.52	23.84
9	82	50	30.39	30.37	53	ESE	Clear	0		19,296	19,296	18,000	18.64	
10	83	54	30.34	30.23	[illegible]1	ENE	Cloudy	0		18,000	19,296	18,000	18.59	23.89
11	92	68	30.13	30.04	87	SSE	?Cloudy	.35		18,000	19,296	19,296	18.52	
[redacted]														
13	82	70	30.01	30.12	91	ESE	Cloudy	.12		57,600	50,256	50,256	19.72	
14	90	73	30.29	30.31	87	SSE	?Cloudy	.01		50,256	55,008	57,600	20.52	
15	91	72	30.32	30.19	87	SSW	Cloudy	0		57,600	62,784	62,784	20.96	24.17
16	94	72	30.13	30.10	76	SW	Clear	0		62,784	65,520	65,520	21.24	
17	92	74	30.14	30.16	84	SW	Cloudy	.02		68,112	74,016	74,016	21.43	24.10
18	80	73	30.0[illegible]	29.98	88	SSE	Cloudy	1.18		74,016	74,016	83,088	21.48	
19	84	68	29.76	29.80	93	SE	Drizzle	1.13		74,016	82,880	83,088	21.66	24.25
20	106	64	29.90	29.90	83	SSW	Clear	0		83,088	86,256	89,568	21.96	
21	107	67	29.95	29.92	76	SSE	Clear	0		86,256	89,936	96,4[illegible]	22.26	
22	100	71	29.97	29.86	69	SSW	Clear	0		96,480	99,936	96,480	22.40	24.15
23	94	68	29.84	29.90	83	NNE	Cloudy	.61		96,480	106,992	103,392	22.46	
24	87	57	30.09	30.20	69	NNE	Cloudy	0		103,392	99,936	99,936	22.52	24.14
25	90	54	30.31	30.24	65	NE	P.Cloudy	0		96,480	99,936	96,480	22.52	
26	96	50	30.20	30.04	69	SSW	Clear	0		92,880	96,480	96,480	22.50	24.09
27	95	60	29.96	29.91	72	NNW	Cloudy	.42		92,880	96,480	92,880	22.46	
28	[illegible]	49	30.06	30.05	55	NE	Clear	0		92,880	92,880	92,880	22.46	
29	93	45	30.10	30.03	55	SSE	Clear	0		86,256	89,568	92,880	22.40	24.09
30	80	53	30.07	29.96	74	SSE	Cloudy	0		89,568	89,568	89,568	22.30	
31	85	70	29.99	30.02	71	SSE	Cloudy	.12		89,568	89,568	89,568	22.22	24.06
TOT.	[illegible]	[illegible]						10.11		Total Cu.Ft. For Month				
AVER.	[illegible]	[illegible]			77					Over Weirs-5,606,[illegible]=				
MAX.										41,93[illegible],[illegible]1 Gals.				
MIN.														

REMARKS:

Spillway of Borough Dam at El. 22.16 based on Mean Low Water

23555-D-2988

Time	Height	[illegible]
12 PM 5"	17.5	25,200
[illegible] 8 1/4"	59.9	86,256
[illegible] 6 3/8"	31.7	45,648
TOTAL CU. FT. 1 DAY		157,104

POHEGANUT RES. : 32.61 = 78 M.G.
SMITH LAKE : 24.13 = 106 M.G.
Ledyard Res. El. 94.43 9:30 A.M. 454 M.G.
" " " 94.50 3:00 P.M.
BUDDINGTON POND - 20 M.G.
POQ. RES. EL. - 18.78 47 M.G.
705 M.G.

TEMP.	WIND	SKY	RAIN
76-68	N.N.E.	CLOUDY	5.14

9:30 A.M.
Hempt. B .84 = 1,070,654 GALS./DAY
Great B. 1.78 = 9,798,437 " "
H.H. Brook 1.86 = 1,891,426 " "
12,760,517 " "
3:00 P.M.
Hempt. B. 1.54
Great B. 2.12
H.H. Brook 1.22

Time	Height	[illegible]
12 P.M. 7"	40.0	57,600
8 A.M. 6 5/8"	34.9	50,256
4 P.M. 6 5/8"	34.9	50,256
TOTAL CU. FT. 1 DAY		158,112

Ledyard Res. EL. 94.85 5:30 A.M.
12" outlet Valve 3/4 open
5:30 P.M. 12" Valve wide open
Ledyard Res. EL. 94.93 5:30 P.M.

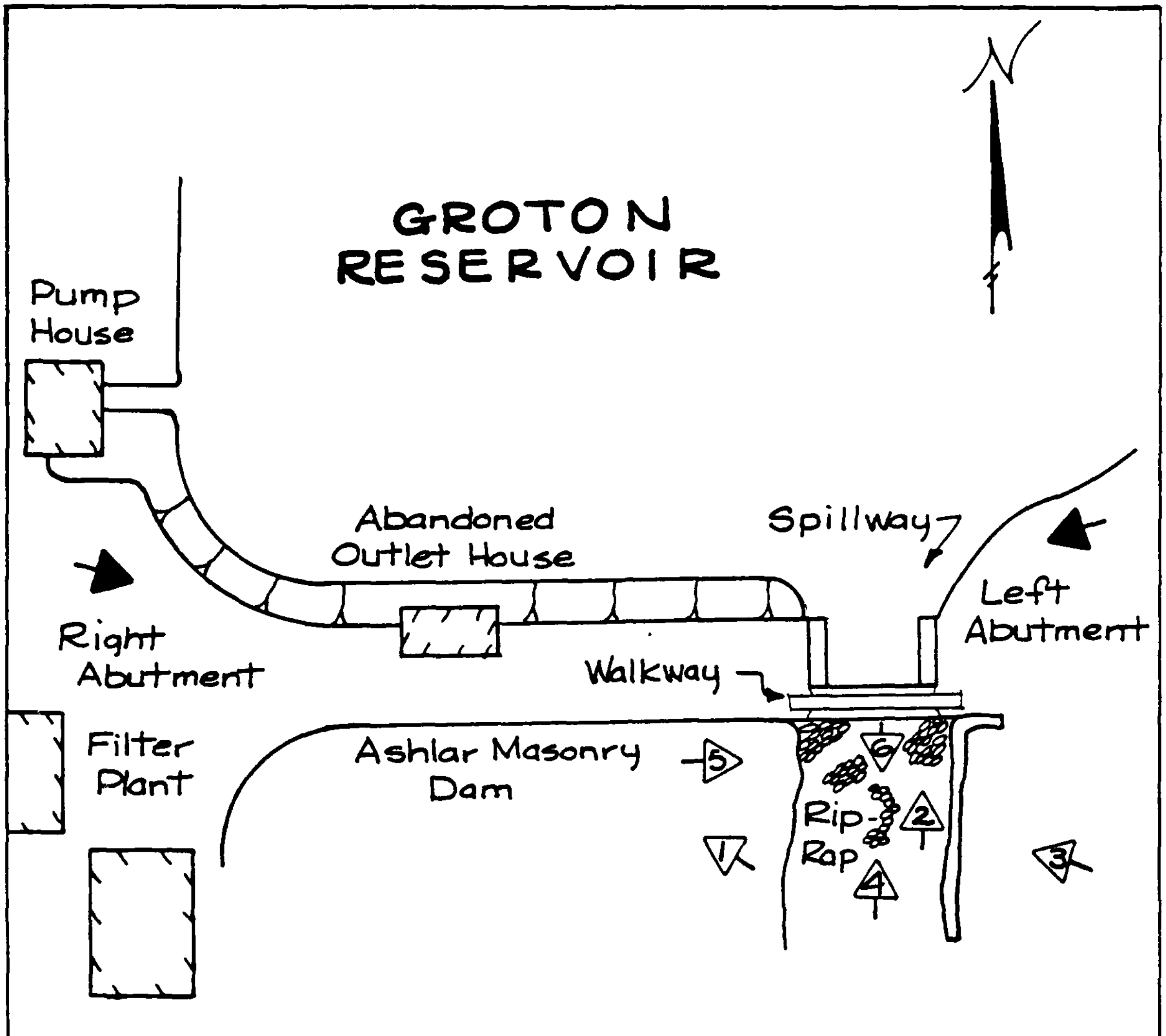
TEMP.	WIND	SKY	RAIN
82-70	E.S.E.	CLOUDY	.12

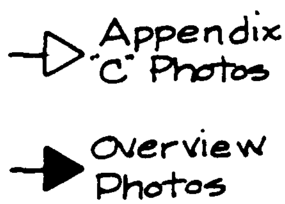
5:30 A.M.
Hempt. 1.72
Great B. 2.26
H.H. Brook 1.24

5:30 P.M.
Hempt. B. 1.66
Great B. 2.16

APPENDIX C

SELECTED PHOTOGRAPHS





LOUIS BERGER & ASSOC.,INC WELLESLEY, MASS. ARCHITECT ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM,MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

POQUONOCK DAM

SKETCH PLAN SHOWING LOCATION &
ORIENTATION OF PHOTOS

STATE-CT.

			SCALE
			DATE

POQUONOCK DAM

1. Downstream face of dam right of spillway.

2. Seepage between concrete spillway sill and masonry.

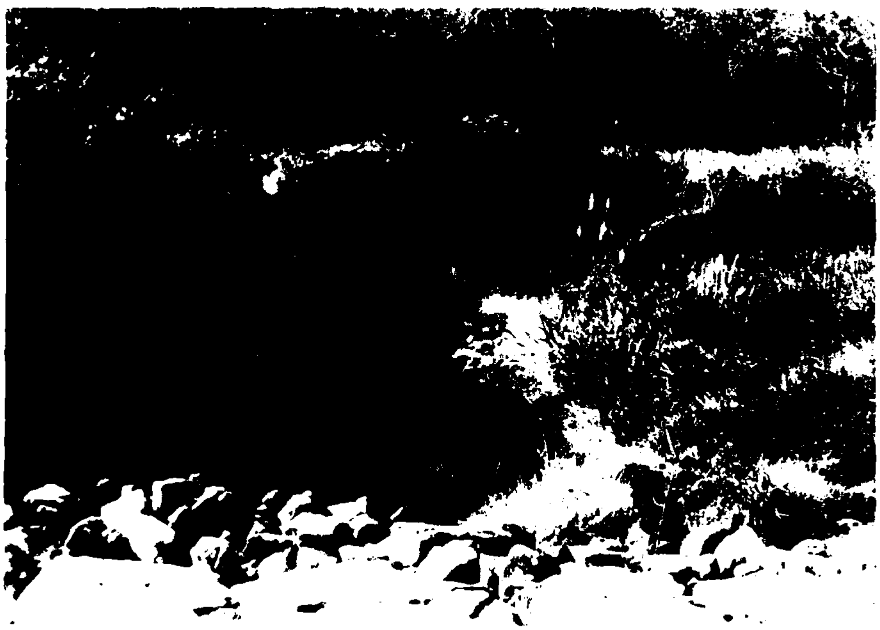
POQUONOCK DAM

3. Downstream face of dam and spillway.

4. Part of spillway and downstream riprap.

POQUONOCK DAM

5. Riprap downstream from spillway.

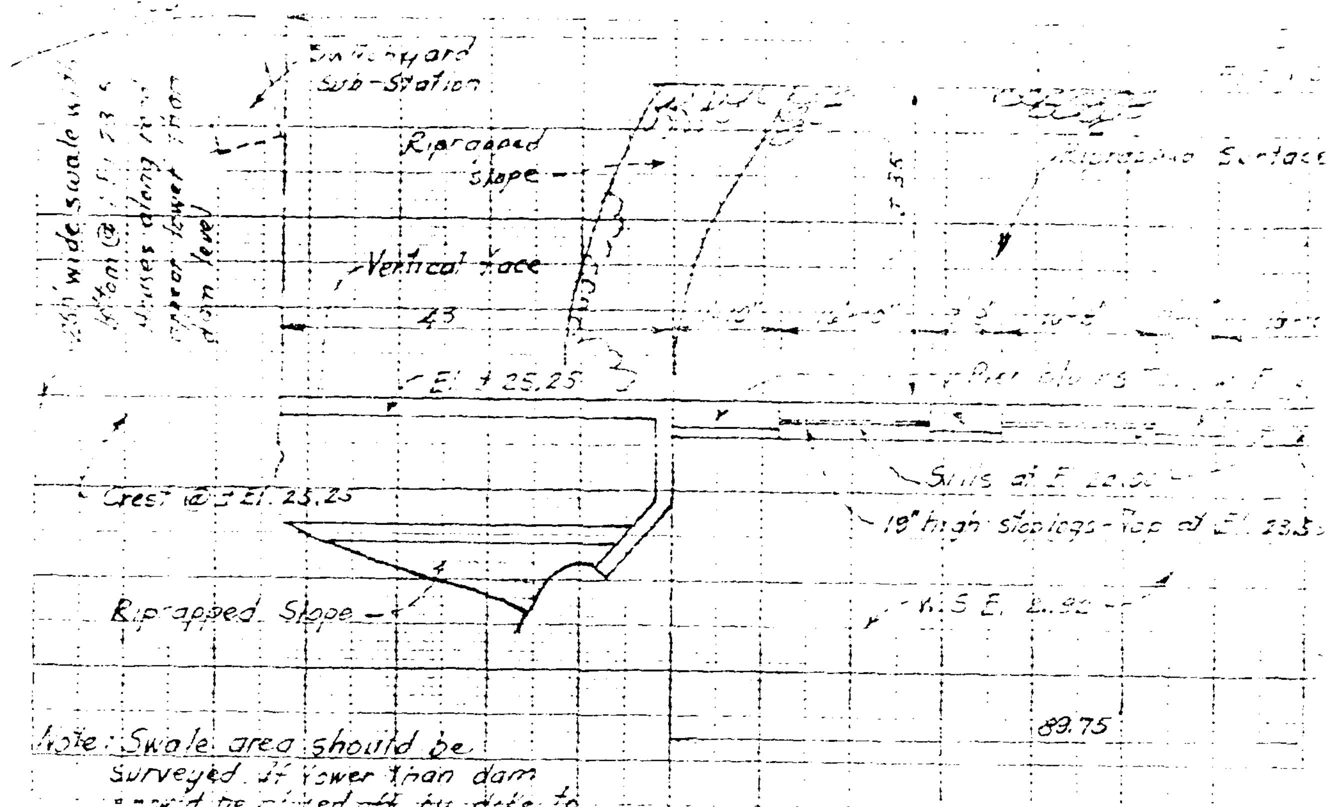


6. Spillway downstream channel.

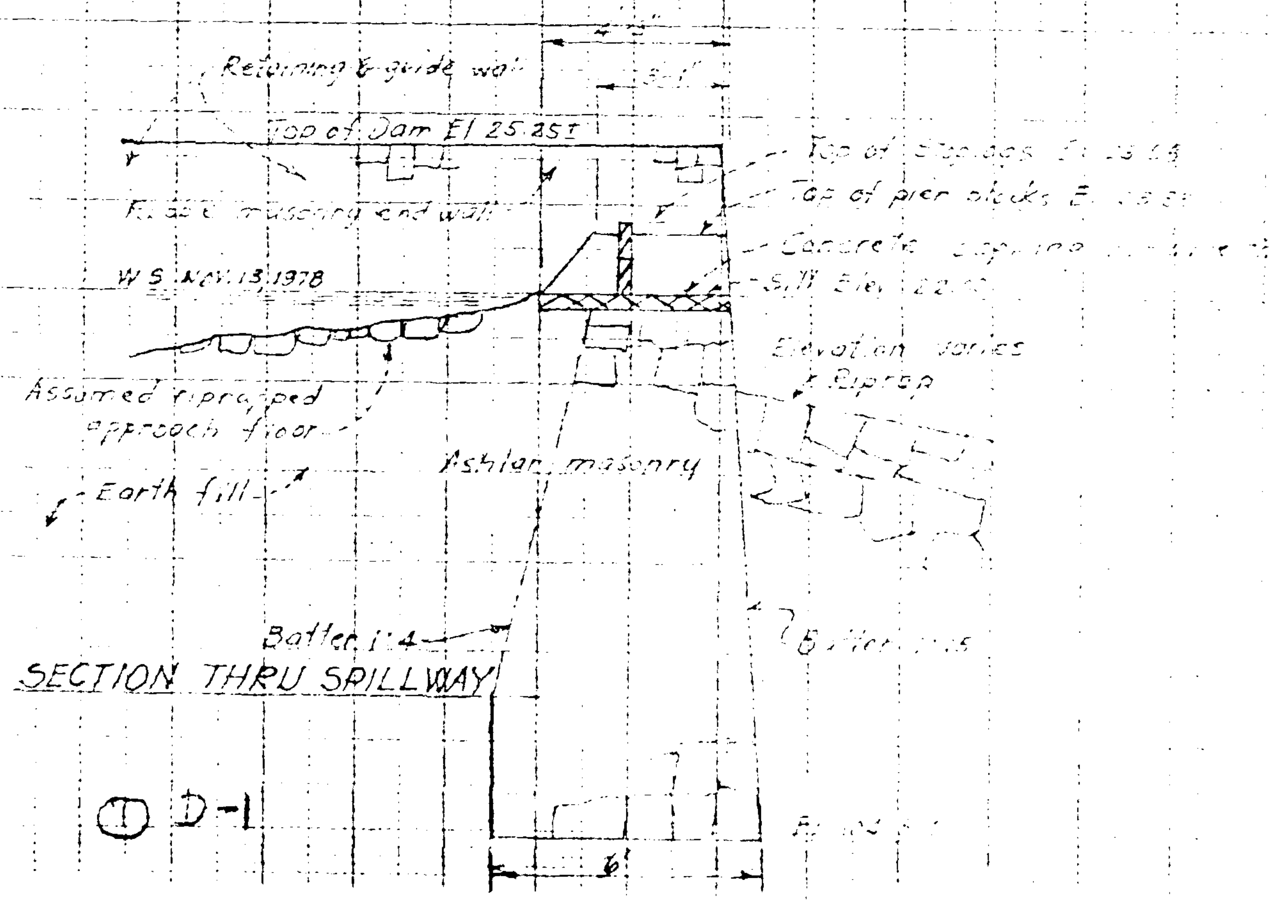
APPENDIX D

HYDROLOGIC & HYDRAULIC COMPUTATIONS

*THIS DOC.

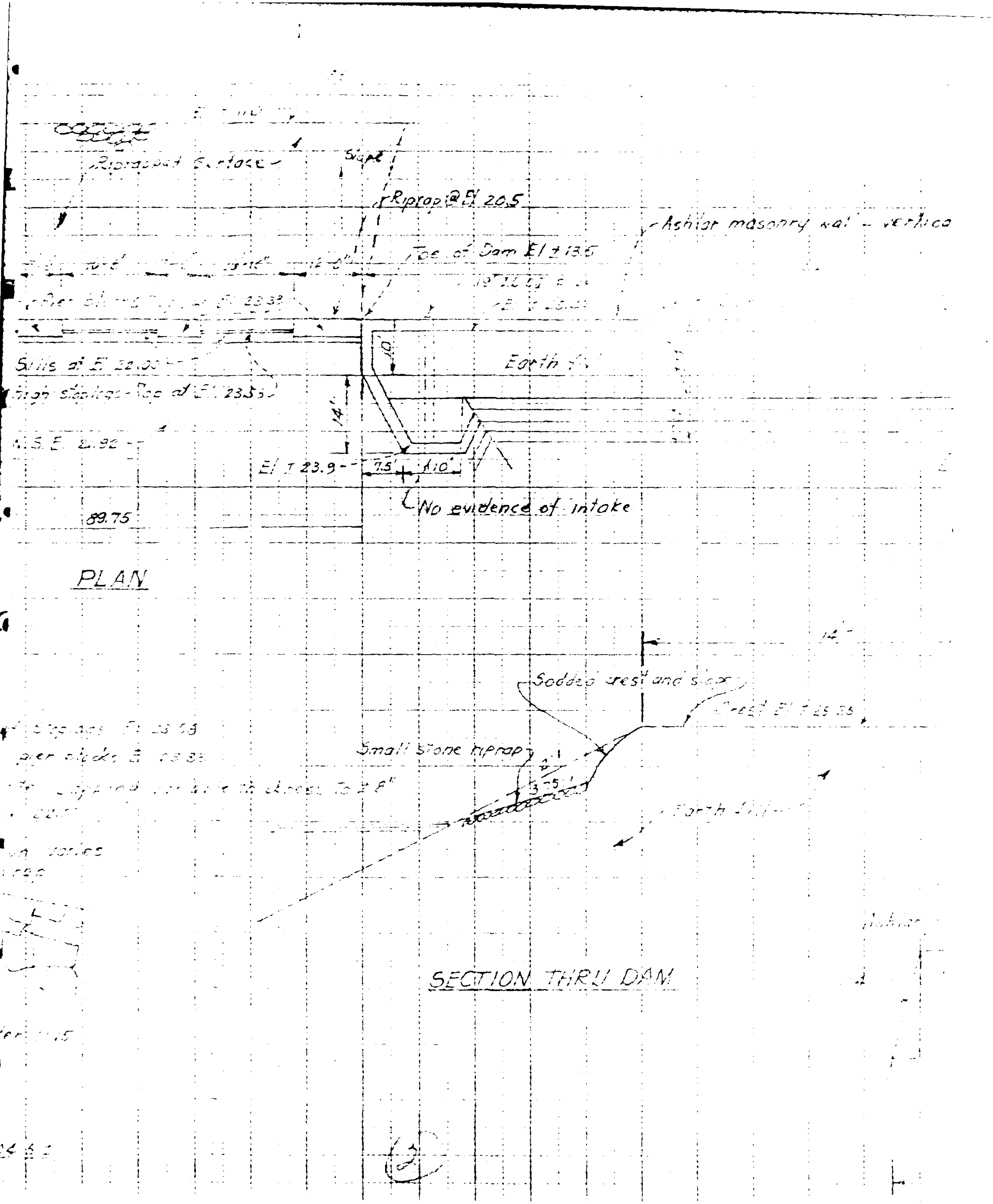


PLAN

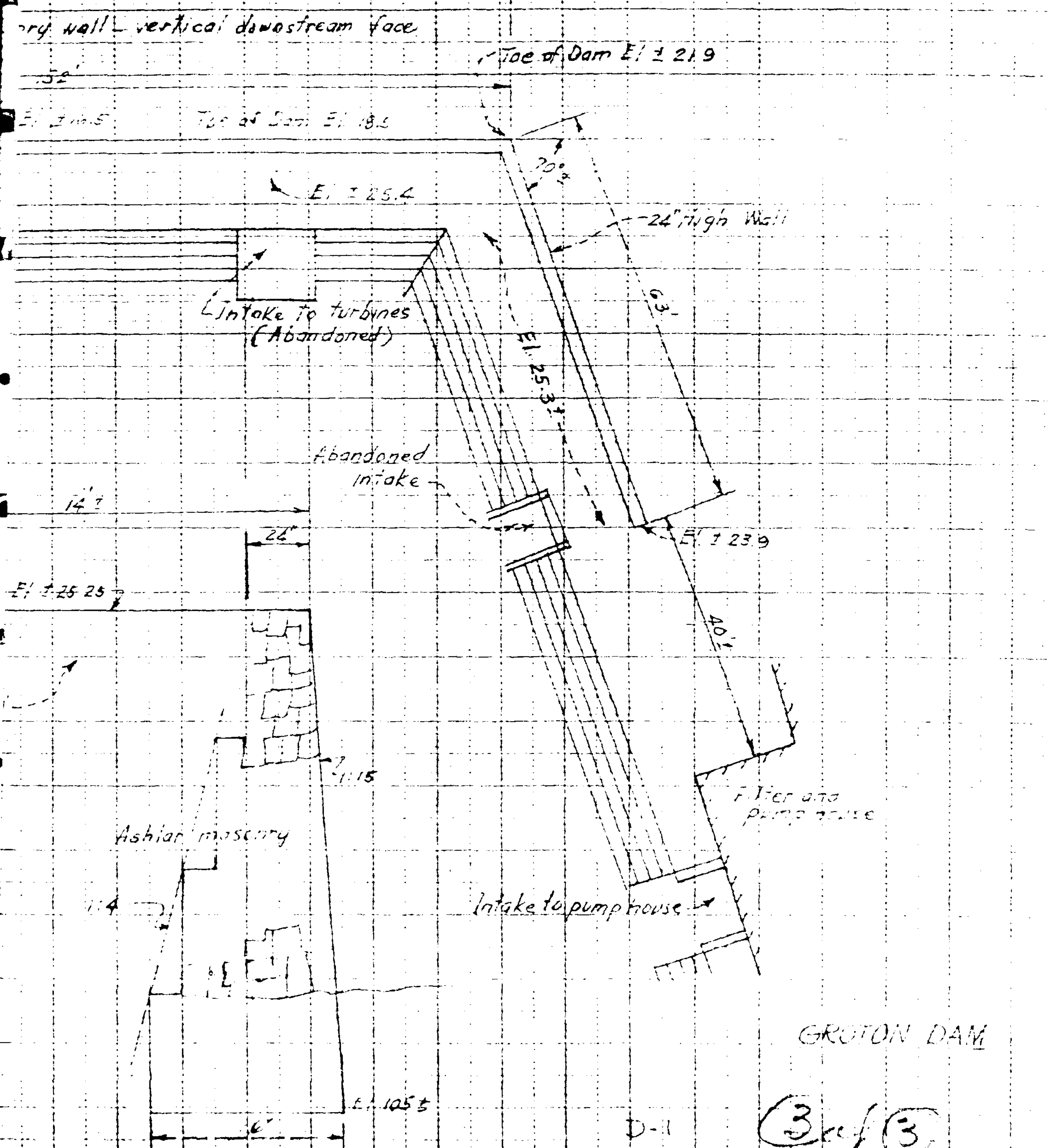


SECTION THRU SPILLWAY

D-1



Riprapped Surface
Slope
Riprap @ El 20.5
Ashlar masonry wal
Toe of Dam El ± 13.5
Earth
El ± 23.9
7.5'
10'
14'
No evidence of intake
89.75
PLAN
14'
Sodded crest and slope
Small stone riprap
3.75
SECTION THRU DAM



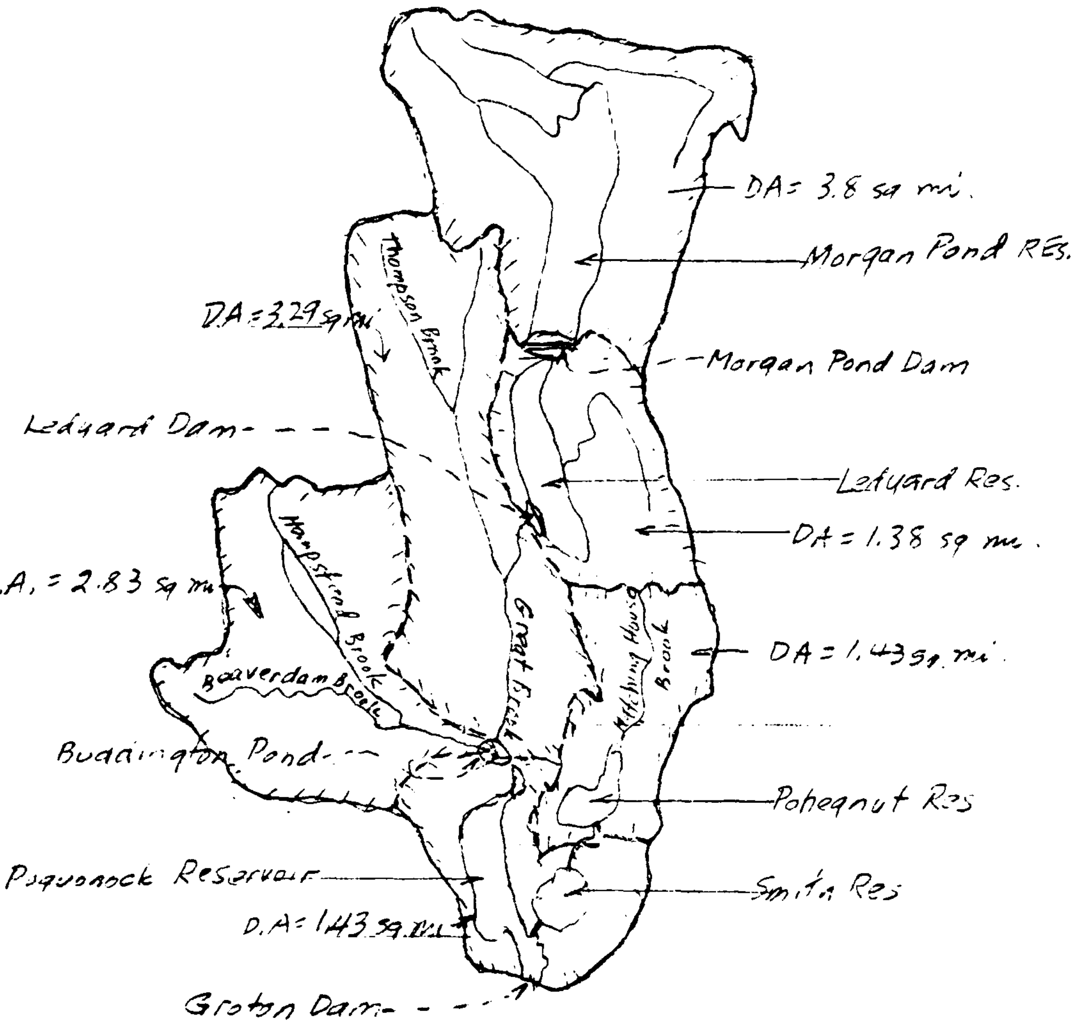
GROTON DAM

D-1

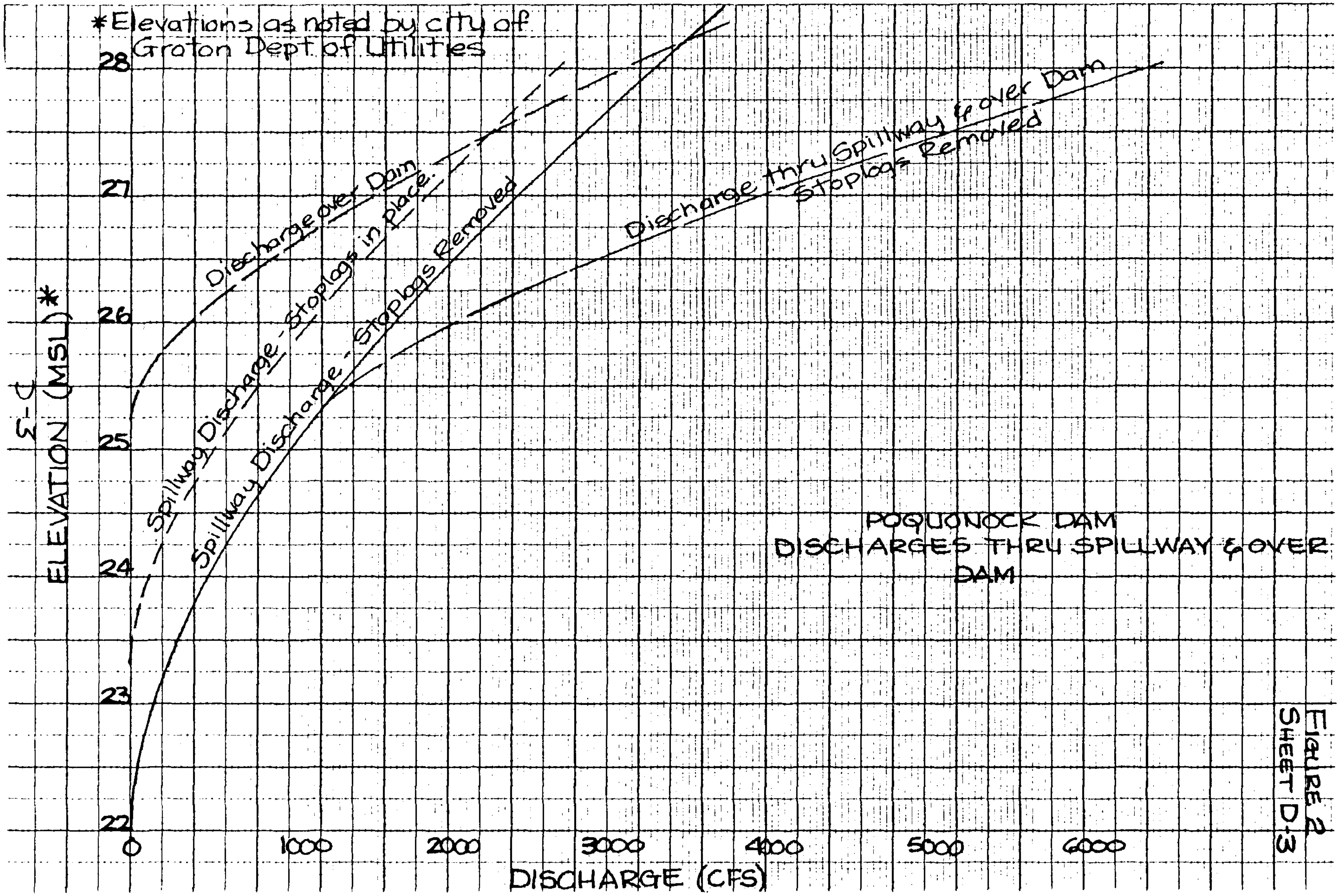
BY ___ DATE 2-2-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-2 OF ___

CHKD. BY ___ DATE ___ INSPECTION OF DAMS- CONN. + R.I. PROJECT ___

SUBJECT GROTON DAM- DRAINAGE AREA LAYOUT



River site	Sub-drainage area sq. mi	Longest Stream Course Mi	Average Stream slope ft/mi	Reservoir impoundment area - acres
Above Morgan Pond Dam	3.80	1.50	99	290
Below Morgan Pond and above Ledyard Dam	1.38	1.16	126	124
Great Brook below Ledyard Dam and above Buddington Pond	3.29	4.62	55	-
Hempstead and Beaverdam Brooks above Buddington Pond	2.83	2.79	27	71
Hatching House Brook above Poheqnut Reservoir	1.43	1.34	69	-
Great Brook above Piquonock Dam and below Buddington Pond	1.43	-	-	184
Total	14.16			


*Elevations as noted by city of Groton Dept of Utilities
POQUONOCK DAM
DISCHARGES THRU SPILLWAY & OVER DAM
FIGURE 2
SHEET D-3
Discharge over Dam
Spillway Discharge - Stoplogs in place
Spillway Discharge - Stoplogs Removed
Discharge thru Spillway & over Dam Stoplogs Removed
ELEVATION (MSL)*
DISCHARGE (CFS)
28
27
26
25
24
23
22
0
1000
2000
3000
4000
5000
6000
D-3

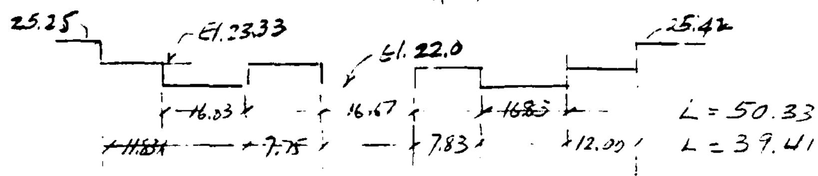
BY C.J.F. DATE 2-5-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-4 OF

CHKD. BY ____ DATE ____ INSPECTION OF DAMS - CONN. & R.I. PROJECT ____

SUBJECT GROTON DAM - POQUONOCK RESERVOIR - HYDRAULICS

GROTON DAM AND POQUONOCK RESERVOIR

SPILLWAY CAPACITY - FLASHBOARDS REMOVED

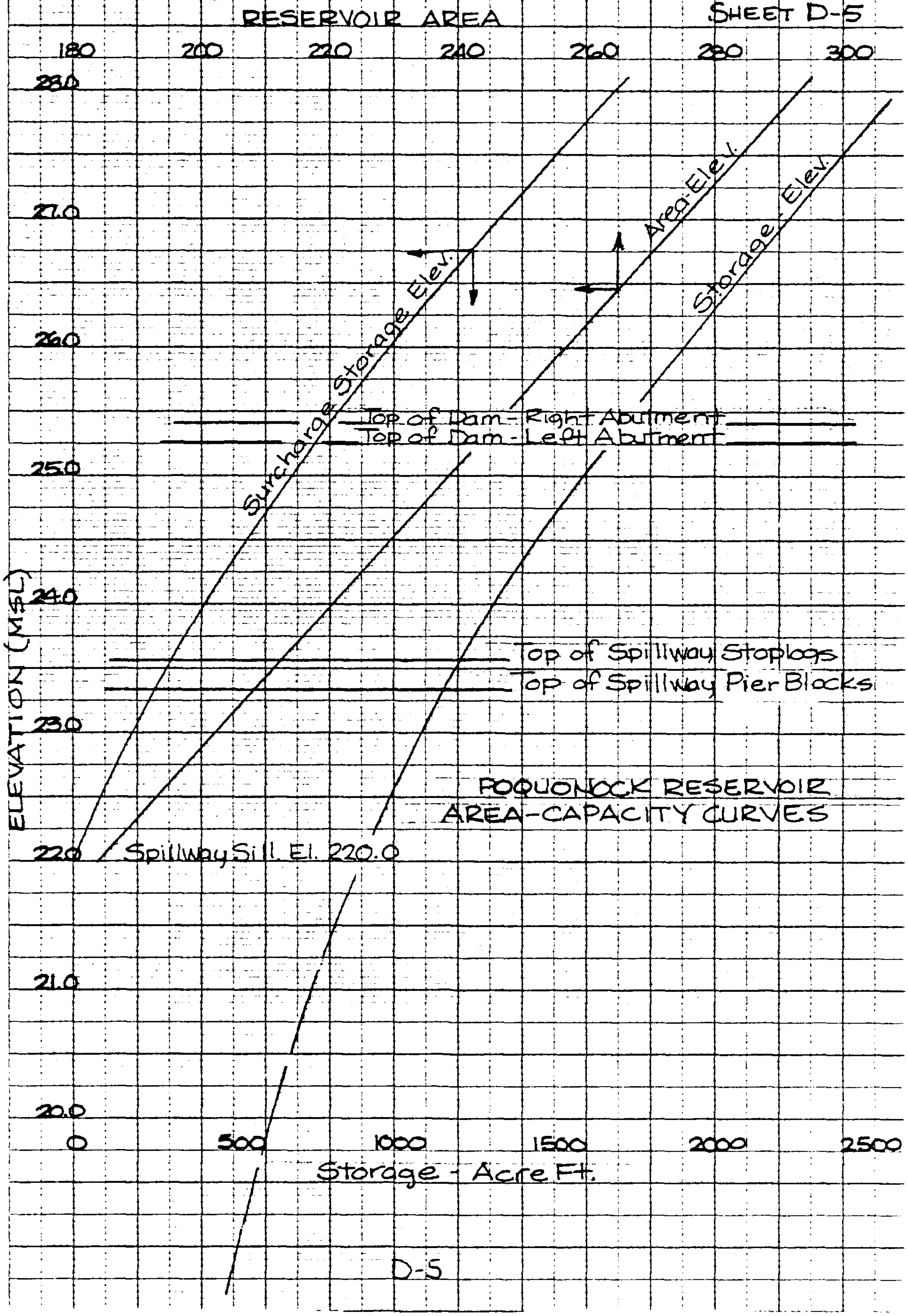


Elev.	Notch @ El 22.0 L=50.33 C=2.9 H	Q	Blocks @ El 23.33 L=39.41 C=2.9 H	Q	Total Q thru Spillway	Over dam @ El 25.25 L=105 C=2.8 H	Q	@ El 25.42 L=152 C=2.8 H	Q	Total Q
22.0	0	0			0					0
22.5	0.5	52			52					52
23.0	1.0	146			146					146
23.33	1.33	224	0	0	224					224
24.00	2.00	413	0.67	63	476					476
25.10	3.00	758	1.67	247	1005					1005
25.25	3.25	855	1.92	304	1159	0	0			1159
25.42	3.42	923	2.09	345	1268	0.17	21	0	0	1289
25.50	3.50	956	2.17	365	1321	0.25	37	0.08	10	1368
25.75	3.75	1060	2.42	430	1490	0.50	104	0.33	81	1675
26.00	4.00	1168	2.67	499	1667	0.75	191	0.58	188	2046
26.50	4.50	1393	3.17	645	2038	1.25	411	1.08	478	2927
27.00	5.00	1632	3.67	804	2436	1.75	651	1.58	845	3932
27.50	5.50	1882	4.17	973	2855	2.25	992	2.08	1277	5124
28.00	6.00	2145	4.67	1153	3298	2.75	1341	2.58	1764	6403

RESERVOIR SURCHARGE STORAGE

Elev	Poquonock Lake Area	Ave Area	Δ Stor	Smith Lake Area ac	Ave Area	Δ Storage	Total Δ Stor	Σ Storage
22.0	184							0
22.5	192	188	94				94	94
23.0	201	196.5	98				98	192
23.33	208	204.5	67				67	259
24.0	220	214	143	46			143	402
25.0	240	230	230	54	50	50	280	682
25.25	243	241.5	60	57	55.5	14	74	756
25.42	246	244.5	42	58	57.5	10	52	808
26.0	256	251	146	62	60	35	181	989
27.0	275	265.5	266	70	66	66	332	1321
28.0	[illegible]	284	284	78	74	74	358	1679

FIGURE 3
SHEET D-5

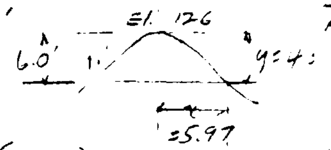


MORGAN POND DAM AND RESERVOIR

DISCHARGE CURVE

Spillway crest El. 126.0 L = 40'

Top of dam El. 135.25 L = 1480'



$\frac{y}{H_0} = -K\left(\frac{x}{H_0}\right)^n$

K = 0.54

n = 1.75

H_0 = 4.46

Say H_0 = 4.5

$\frac{P}{H_0} = \frac{6}{4.5} = 1.33$

C_s = 3.9

Elev.	H	H/H_0	C/C_s	C	Q Spillway	Q (c=2.8) Dam	Total Q
126	0	0	-		0	- -	0
127	1.0	.22	.86	3.35	134		134
128	2.0	.44	.91	3.55	402		402
129	3.0	.67	.95	3.70	769		769
130	4.0	.89	.985	3.85	1232		1232
131	5.0	1.11	1.01	3.90	1744		1744
132	6.0	1.33	1.04	4.0	2351		2351
133	7.0	1.56	1.065	4.15	3074		3074
134	8.0	1.78	1 -	4.15	3756		3756
135	9.0	2.0	-	4.15	4482		4482
135.25	9.25		-	4.15	4670	0	4670
136.25	10.25			4.15	5447	4144	9591

RESERVOIR SURCHARGE STORAGE

ELEV	Area Ac	Ave Area	Δ storage	Surcharge Σ Storage
126	290			0
127	325	307.5	308	308
128	348	336.5	336	644
129	365	356.5	356	1000
130	381	373	373	1373
131	394	387.5	388	1761
132	405	399.5	400	2161
133	417	411	411	2572
134	427	422	422	2994
135	437	432	432	3426
135.25	439	438	110	3536
136.25	448	443.5	443	3979

LEDYARD RESERVOIR AND DAM - DISCHARGE CURVE

Spillway crest El. 95.0 L = 100'
Top of dam El. 100.25 L = 1670

El. 95 / El. 93, H = 4, P = 2.0, P/H = 0.5, $C_0 = 3.849 = 3.4$

Elev.	Spillway H	H/Hd	C/Co	C	Spillway Q	Dam H	Dam C	Dam Q	Total Q
95	0.0				0				0
96	1.0	0.25	.866	3.1	310				310
97	2.0	0.5	.92	3.1	877				877
98	3.0	0.75	.965	3.3	1715				1715
99	4.0	1.0	1.0	3.4	2800				2800
100	5.0	1.25	1.03	3.5	3913				3913
100.25	5.25	1.31	1.04	3.54	4270	0			4270
100.5	5.50	1.38	1.045	3.55	4579	.25	2.8	584	5163
101.0	6.0	1.5	1.06	3.6	5290	.75	2.8	3037	8327
102.0	7.0	1.75	1.07	3.6	6667	1.75	2.8	10825	17492

RESERVOIR SURCHARGE STORAGE

Elev	Area-Acres	Average Area-Ac	Δ Storage	Σ Surcharge Storage
95	124			0
96	130	127	127	127
97	136	133	133	260
98	142	139	139	399
99	148	145	145	544
100	154	151	151	695
100.25	155	154.5	38	733
100.75	157	156	117	850
101	160	155.5	79	929
102	166	163	163	1092

CHESTNUT RESERVOIR AND DAM - DISCHARGE CURVE

SPILLWAY CREST El. 36.0 L = 60'
TOP OF DAM ELEV. 41.15 L = 1015
DIKE 41.15 L = 940

El 35.5 El 36 F = 2.0 El 34.5 El 35

Elev	H	Spillway Q	Dam and Dike H	Dam and Dike Q (C=2.8, L=1955)	Total Q	With flashboards in place 2.0: H	C	Spillway Q	Total Q
36.0	0	0			0				
37.0	1	174			174				
38.0	2	492			492	0	3.2	0	0
39.0	3	904			904	1.0	3.2	192	192
40.0	4	1392			1392	2.0	3.2	543	543
41.0	5	1945			1945	3.0	3.2	998	998
41.15	5.15	2034	0	0	2034	3.15	3.2	1073	1073
41.25	5.25	2093	0.10	173	2266	3.25	3.2	1125	1298
41.50	5.50	2244	0.35	1133	3377	3.5	3.2	1257	2390
42.0	6.0	2557	0.85	4290	6847	4.0	3.2	1536	5826

RESERVOIR SURCHARGE STORAGE

Elev	Area Ac	Ave Area Ac	Δ Storage	Above El. 36 Σ Surcharge Storage	Above El. 38 Surcharge
36.0	74			0	
37.0	82	78	78	78	
38.0	91	86	86	164	0
39.0	95	94	94	258	94
40.0	105	102	102	360	196
41.0	114	109	109	469	305
41.15	115	114.5	17	486	322
41.50	118	116.5	41	527	[illegible]
42.0	122	120	60	587	[illegible]

BY DJK DATE 2-2-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-9 OF

CHKD. BY ______ DATE ________ PROJECT ____________

SUBJECT GROTON DAM - POQUONOCK RESERVOIR - HYDROLOGY

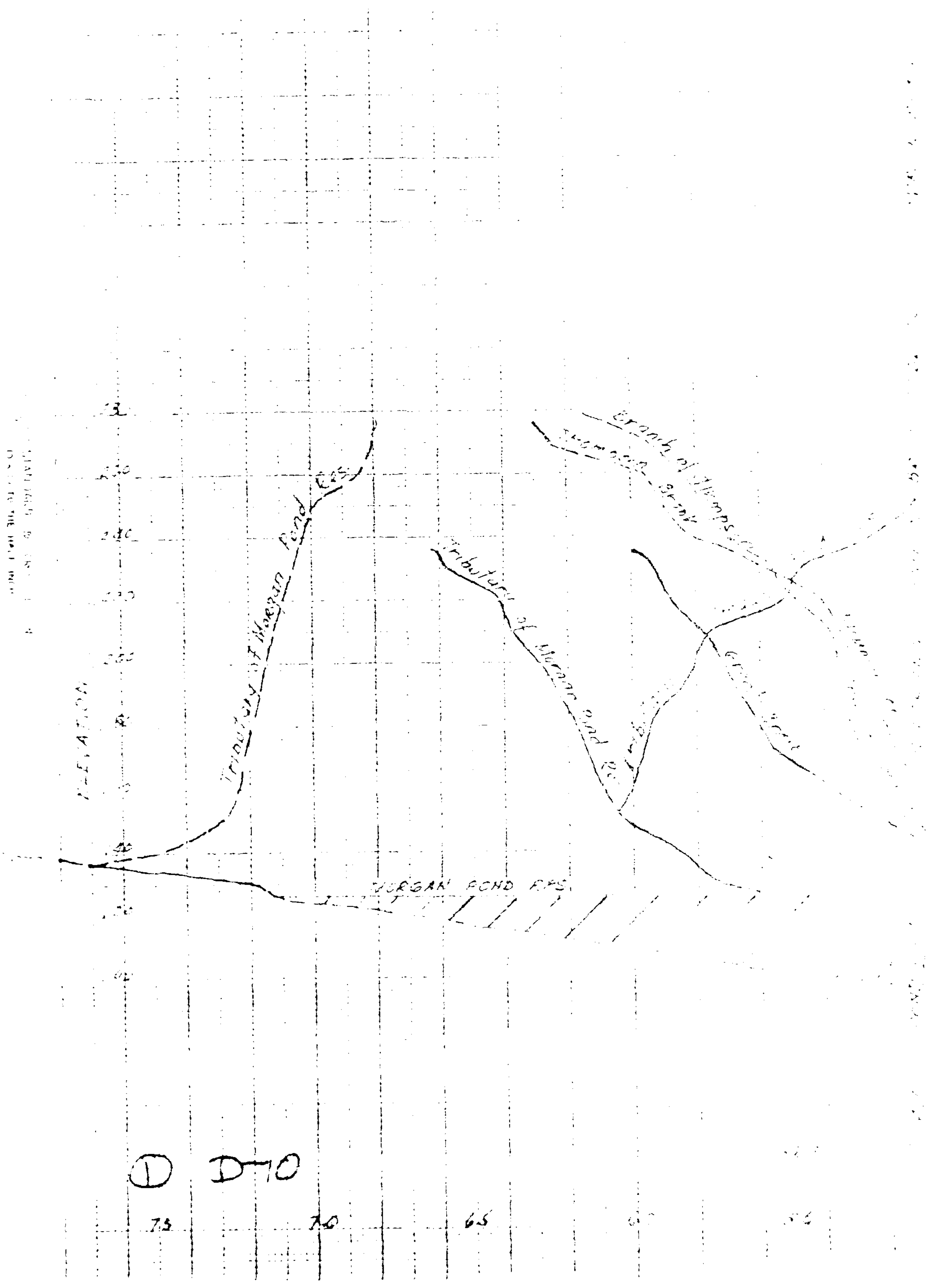
RAINFALL DATA - 10 square mile area Southern Conn = 24.7"

Reduction factor for 14.16 sq mi area 19.5%

% of 10 sq mi area for 14.2 sq mi = 96%

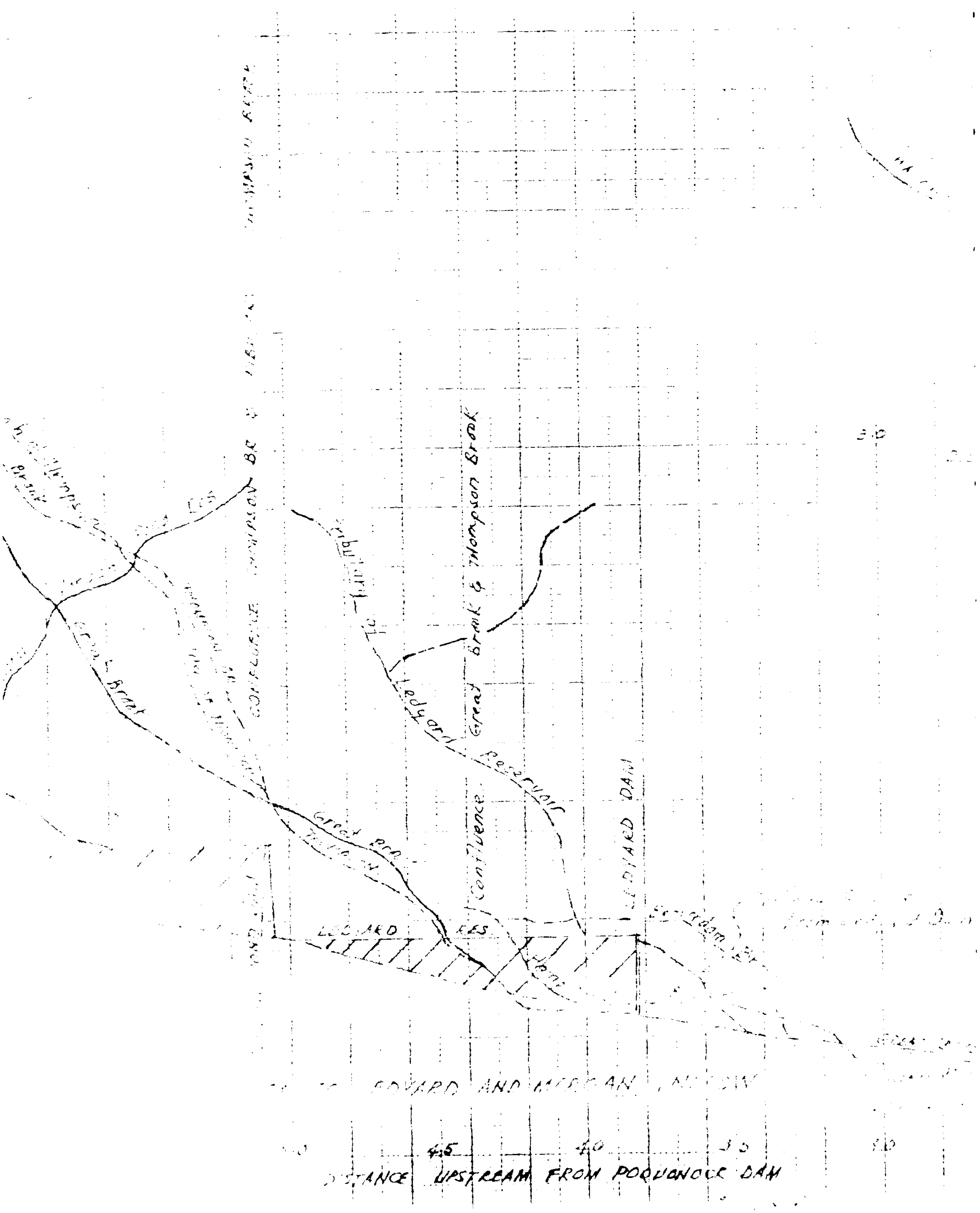
Total adjusted rainfall = .96 × .805 = .773%, × 24.7 = 19"

Time Hrs	Rearranged % of 6 hr	Δ Precip. inches	Infiltration Loss inches	Rainfall excess
0				
0.5	5.0	.95	0.50	0.45
1.0	5.0	.95	0.50	0.45
1.5	5.5	1.05	0.10	0.95
2.0	6.5	1.24	0.10	1.14
2.5	7.0	1.33	0.10	1.23
3.0	8.0	1.52	0.10	1.42
3.5	10.0	1.90	0.10	1.80
4.0	28.0	5.32	0.10	5.22
4.5	7.0	1.33	0.10	1.23
5.0	7.0	1.33	0.10	1.23
5.5	6.0	1.14	0.10	1.04
6.0	5.0	.94	0.10	0.84
		19.0	2.0	17.0



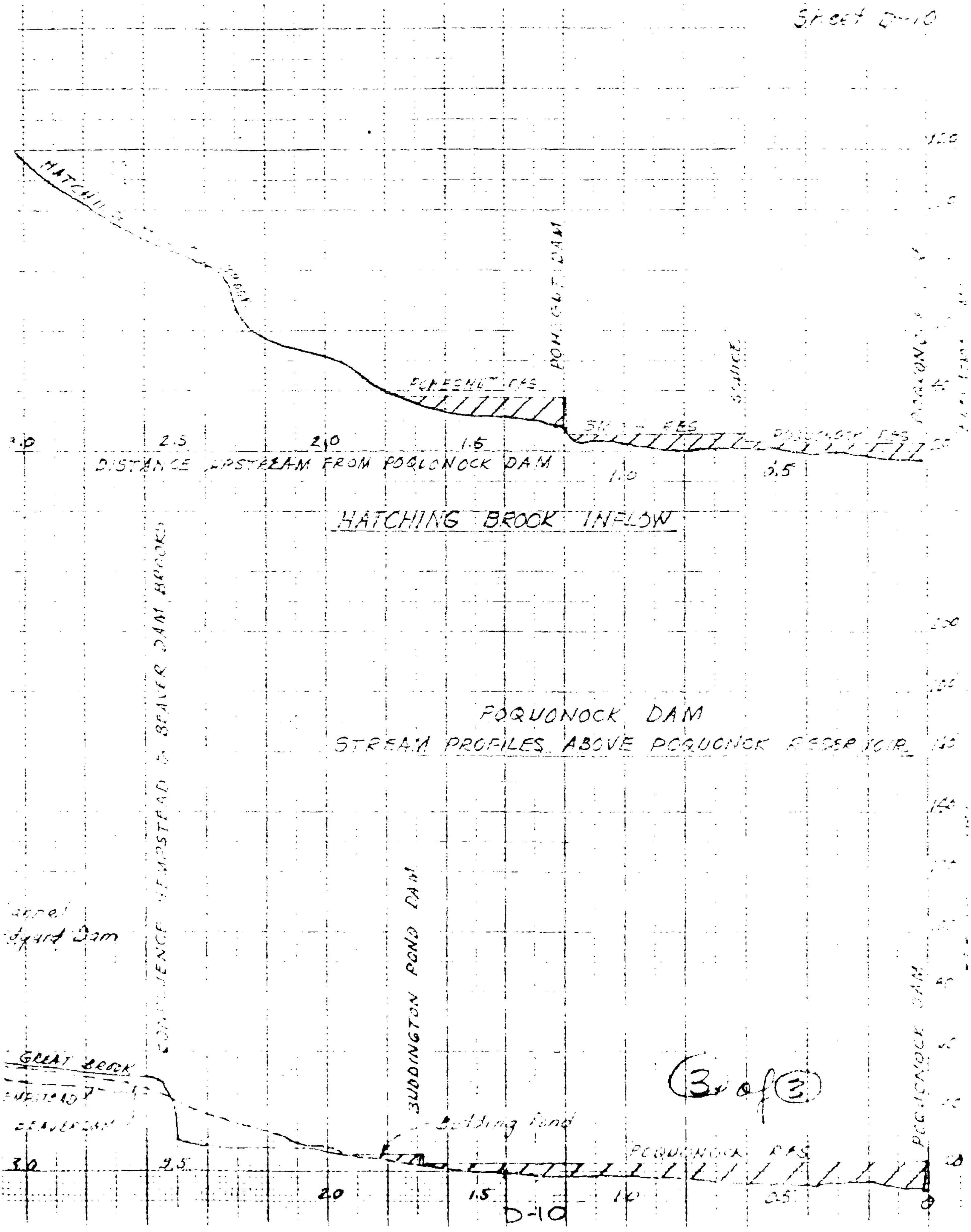
Tributary of Morgan Pond Bk.
Tributary of Morgan Pond Bk.
MORGAN POND BKS.
ELEVATION
75
70
65

D-10



Great Brook & Thompson Brook
Ledyard Reservoir
LEDYARD DAM
Confluence
Great Brook
LEDYARD RES.
4.5
4.0
3.5
3.0
DISTANCE UPSTREAM FROM POQUONOCK DAM

Sheet D-10


HATCHING BROOK
POND
PONDING EFS
POQUONOCK DAM
SLUICE
POQUONOCK
DISTANCE UPSTREAM FROM POQUONOCK DAM
2.5
2.0
1.5
1.0
0.5
HATCHING BROOK INFLOW
POQUONOCK DAM
STREAM PROFILES ABOVE POQUONOCK RESERVOIR
CONFLUENCE HEMPSTEAD & BEAVER DAM BROOKS
BUDDINGTON POND DAM
GREAT BROOK
BEAVER DAM
Budding Pond
POQUONOCK EFS
POQUONOCK DAM
3.0
2.5
2.0
1.5
1.0
0.5
0
3 of 3

LOUIS BERGER & ASSOCIATES INC.

BY: [initials] DATE: 2-2-79 SHEET NO. D-11 OF

CHKD. BY: DATE: PROJECT:

SUBJECT: GROTON DAM - POQUONOCK RESERVOIR - HYDROLOGY

$Lag = K\left(\frac{L \times L_c}{\sqrt{S}}\right)^{.3}$ $T_p = 0.75\,Lag + .375D$ $T_c = 1.67\,T_p - 0.83D$

Reach	Sta Point	Longest stream (L), mi Sub	Longest stream (L), mi Total	Stream slope Ft/mi Sub	Stream slope Ft/mi Total	Lag hrs Corrected K=3.75 Sub	Lag hrs Total	Unitgraph Tp D=1.0 hr Computed	Unitgraph Tp Adopted	Tc hrs	Ave Velocity Ft/sec	Transport time From-To	Miles	Ave V Ft/sec	Hrs
Morgan Pond Res. DA = 3.8 sq mi	275 to 150	0.48		260		0.73									
	126	1.02		23.5		1.74	2.53	2.26							
			1.50		91.3		1.63	1.75							
	250 to 150	.93		107.5		1.31									
	122	.48		50.0		0.90	2.27	2.00							
			1.41		87.9		1.78	1.71	2.00	2.51	0.82	Morgan Pond – Poquonock	2.2	1.08	3.0
Ledyard Res. DA = 1.38 Ac.	240 to 185	0.50		110		0.87									
	94	0.66		137.9		1.00	1.87	1.77							
			1.16		125.9		1.48	1.48	1.50	1.68	1.01				3.0
Great Brook and Thompson above Poquonock DA = 3.21 Ac.	275 to 220	.91		61.1		1.41									
	140	.34		235.3		0.59									
	70	.86		81.4		1.31									
	50	1.65		12.1		2.75									
	30	0.05		400		0.15									
	23	.82		8.54		1.83	8.04	6.40							
			4.62		54.5		4.23	3.54	5.0	7.52	0.90				0
Hempstead and Beaverdam Brooks DA = 2.83 Ac.	105 to 90	0.76		9.2		1.73									
	60	.30		105.5		0.70									
	23	1.67		22.2		2.50	4.94	4.08							
			2.79		29.4		3.36	2.89	3.5	5.0	0.82				0

BY GTH DATE 2-2-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-12 OF

CHKD. BY ____ DATE ____ PROJECT ____

SUBJECT GROTON DAM - POQUONOCK RESERVOIR - HYDROLOGY

Reach	STA. Point	Longest stream length - mi Sub	Longest stream length - mi Total	Stream slope Ft/mi Sub	Stream slope Ft/mi Total	Kirp. hrs. Sub	Kirp. hrs. Total	Unitgraph Tp D=1.0 hr Computed	Unitgraph Tp D=1.0 hr Adopted	Tc - hrs	Ave. velocity Ft/sec	Transport Time From - to	Transport Time Miles	Transport Time Ave V Ft/sec	Transport Time Hrs.
Pohegnut Res. Hatchery Brk.	130 to 80	.74		676		1.22									
DA = 1.43 sq mi	60	.08		250		0.23									
	38	.52		42.3		1.04	2.49	2.24							
			1.34		68.7		1.80	1.72	2.0	2.5	0.79				0
Poquonock & Smith Res. DA = 1.43 sq.mi.									1.0						0
Total D.A = 14.16 sq.mi								Weighted mean velocity			0.87				

D-12

BY QQ DATE 2-2-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-13 OF

CHKD. BY ______ DATE ______ PROJECT ______

SUBJECT GROTON DAM - POQUONOCK RESERVOIR - HYDROLOGY

POQUONOCK + SMITH RES

$T_p = 1.0$ DA = 1.43

Time HRS	T/T_p	Q/Q_p	$Q_p = 692.12$ Q
0.5	0.5	0.43	298
1.0	1.0	1.00	692
1.5	1.5	.66	457
2.0	2.0	.32	221
2.5	2.5	.155	107
3.0	3.0	.075	52
3.5	3.5	.036	25
4.0	4.0	.018	12
4.5	4.5	.009	6
5.0	5.0	.004	3
5.5			
6.0			
6.5			
7.0			
7.5			

Ledyard Reservoir

$T_p = 1.5$ DA = 1.3859 mi²

Time hrs	T/T_p	Q/Q_p	$Q_p = 445.28$ Q
0.5	0.33	0.19	85
1.0	0.67	0.72	320
1.5	1.00	1.00	445
2.0	1.33	0.81	361
2.5	1.67	0.51	227
3.0	2.00	0.32	142
3.5	2.33	0.20	89
4.0	2.67	0.115	51
4.5	3.00	0.075	33
5.0	3.33	0.045	20
5.5	3.67	0.03	13
6.0	4.00	0.018	8
6.5	4.33	0.011	5
7.0	4.67	0.005	2
7.5	5.00	0.002	1

MORGAN POND RES

$T_p = 2.0$ DA = 3.80

TIME HRS	T/T_p	Q/Q_p	$Q_p = 917.6$ Q
0.5	0.25	.115	106
1.0	0.50	.43	395
1.5	0.75	.84	772
2.0	1.00	1.00	917
2.5	1.25	.88	809
3.0	1.50	.66	607
3.5	1.75	.45	414
4.0	2.00	.32	294
4.5	2.25	.225	207
5.0	2.50	.153	141
5.5	2.75	.104	96
6.0	3.00	.075	69
6.5	3.25	.052	48
7.0	3.50	.035	32
7.5	3.75	.025	23
8.0	4.00	.018	17
8.5	4.25	.013	12
9.0	4.50	.009	8
9.5	4.75	.005	5
10.0	5.00	.002	2

BY ___ DATE 2-2-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-14 OF ___

CHKD. BY ______ DATE ______ PROJECT ______

SUBJECT GROTON DAM – POQUONOCK RESERVOIR – HYDROLOGY

CHESNUT RESERVOIR and HATCHING HOUSE BROOK

Tp = 2.5 DA = 1.43 sq.mi

Time Hrs	T/Tp	Q/Qp	Qp=276.85 Q
0.5	0.2	.075	21
1.0	0.4	.28	78
1.5	0.6	.60	166
2.0	0.8	.89	246
2.5	1.0	1.00	277
3.0	1.2	.92	255
3.5	1.4	.75	208
4.0	1.6	.56	155
4.5	1.8	.42	116
5.0	2.0	.32	89
5.5	2.2	.24	66
6.0	2.4	.18	50
6.5	2.6	.13	36
7.0	2.8	.098	27
7.5	3.0	.075	21
8.0	3.2	.059	16
8.5	3.4	.044	12
9.0	3.6	.032	9
9.5	3.8	.025	7
10.0	4.0	.018	5
10.5	4.2	.014	4
11.0	4.4	.011	3
11.5	4.6	.008	2
12.0	4.8	.006	2
12.5	5.0	.006	1

HEMPSTED AND BEAVERDAM BROOKS

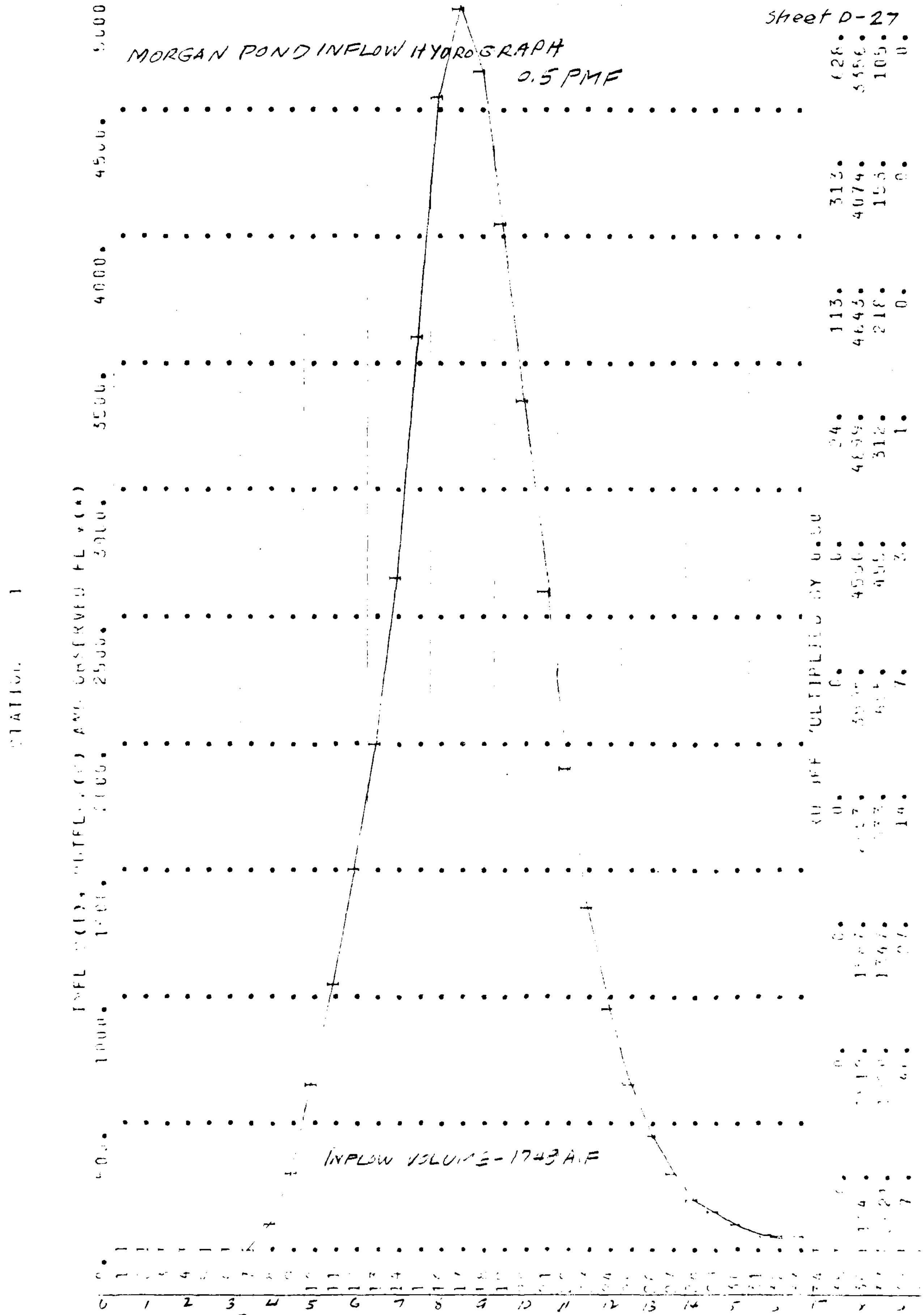
Tp = 3.5 DA = 2.83

Time Hrs	T/Tp	Q/Qp	Qp=391.35 Q
0.5	.143	.041	16
1.0	.286	.148	58
1.5	.429	.338	132
2.0	.571	.551	216
2.5	.714	.794	311
3.0	.857	.936	366
3.5	1.00	1.00	391
4.0	1.143	.954	373
4.5	1.286	.853	334
5.0	1.429	.731	286
5.5	1.571	.589	231
6.0	1.714	.479	187
6.5	1.857	.394	154
7.0	2.00	.32	125
7.5	2.143	.261	102
8.0	2.286	.215	84
8.5	2.429	.172	67
9.0	2.571	.135	53
9.5	2.714	.110	43
10.0	2.857	.092	36
10.5	3.00	.075	29
11.0	3.143	.064	25
11.5	3.286	.053	21
12.0	3.429	.042	16
12.5	3.571	.033	13
13.0	3.714	.028	11
13.5	3.857	.023	9
14.0	4.00	.018	7
14.5	4.143	.015	6
15.0	4.286	.013	5
15.5	4.429	.010	4
16.0	4.571	.009	3
16.5	4.714	.007	3

GREAT AND THAMES BKS.

Tp = 5.0 D.A. = 3.29

Time Hrs	T/Tp	Q/Qp	Qp=318.4 Q
0.5	0.1	.015	5
1.0	0.2	.075	24
1.5	0.3	.16	51
2.0	0.4	.28	89
2.5	0.5	.43	137
3.0	0.6	.60	191
3.5	0.7	.77	245
4.0	0.8	.89	283
4.5	0.9	.97	309
5.0	1.0	1.00	318
5.5	1.1	.98	312
6.0	1.2	.92	293
6.5	1.3	.84	268
7.0	1.4	.75	239
7.5	1.5	.66	210
8.0	1.6	.56	178
8.5	1.7	.49	156
9.0	1.8	.42	134
9.5	1.9	.37	118
10.0	2.0	.32	102
10.5	2.1	.28	89
11.0	2.2	.24	76
11.5	2.3	.21	67
12.0	2.4	.18	57
12.5	2.5	.155	49
13.0	2.6	.13	4[illegible]
13.5	2.7	.11[illegible]	3[illegible]
14.0	2.8	.098	31
14.5	2.9	.087	28
15.0	3.0	.075	24
15.5	3.1	.067	21
16.0	3.2	.059	19
16.5	3.3	.052	17


MORGAN POND INFLOW HYDROGRAPH
0.5 PMF
INFLOW VOLUME - 1743 A.F
TIME IN HOURS

Sheet D-28

HYDROGRAPH ROUTING

[illegible] OF 0.5 PMF INFLOW

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
11	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

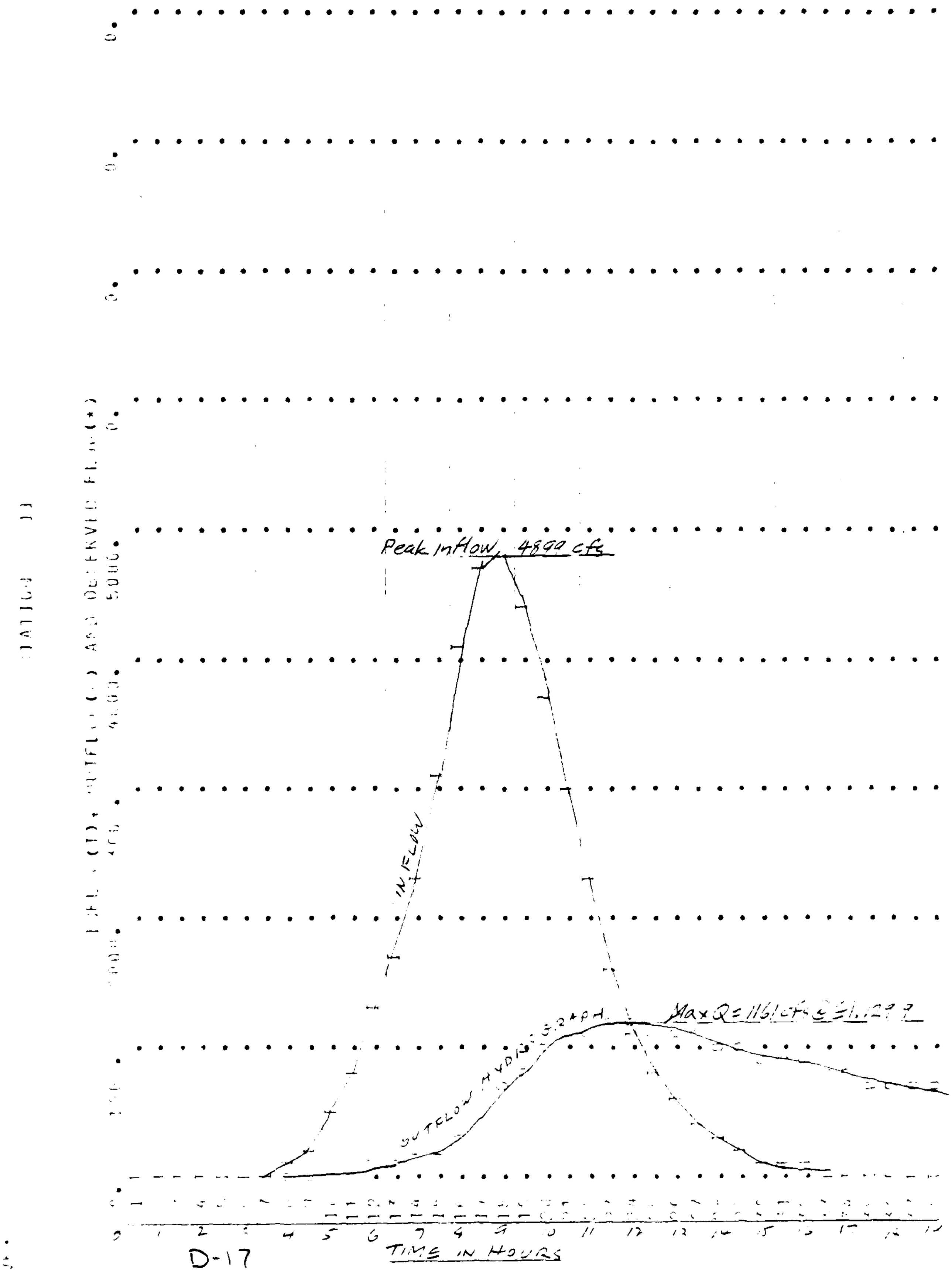
STORAGE=	644.	1000.	1374.	1761.	2572.	2994.	3426.	3536.	3973.
OUTFLOW=	40.	739.	1232.	1744.	3024.	3756.	4482.	4570.	5351.

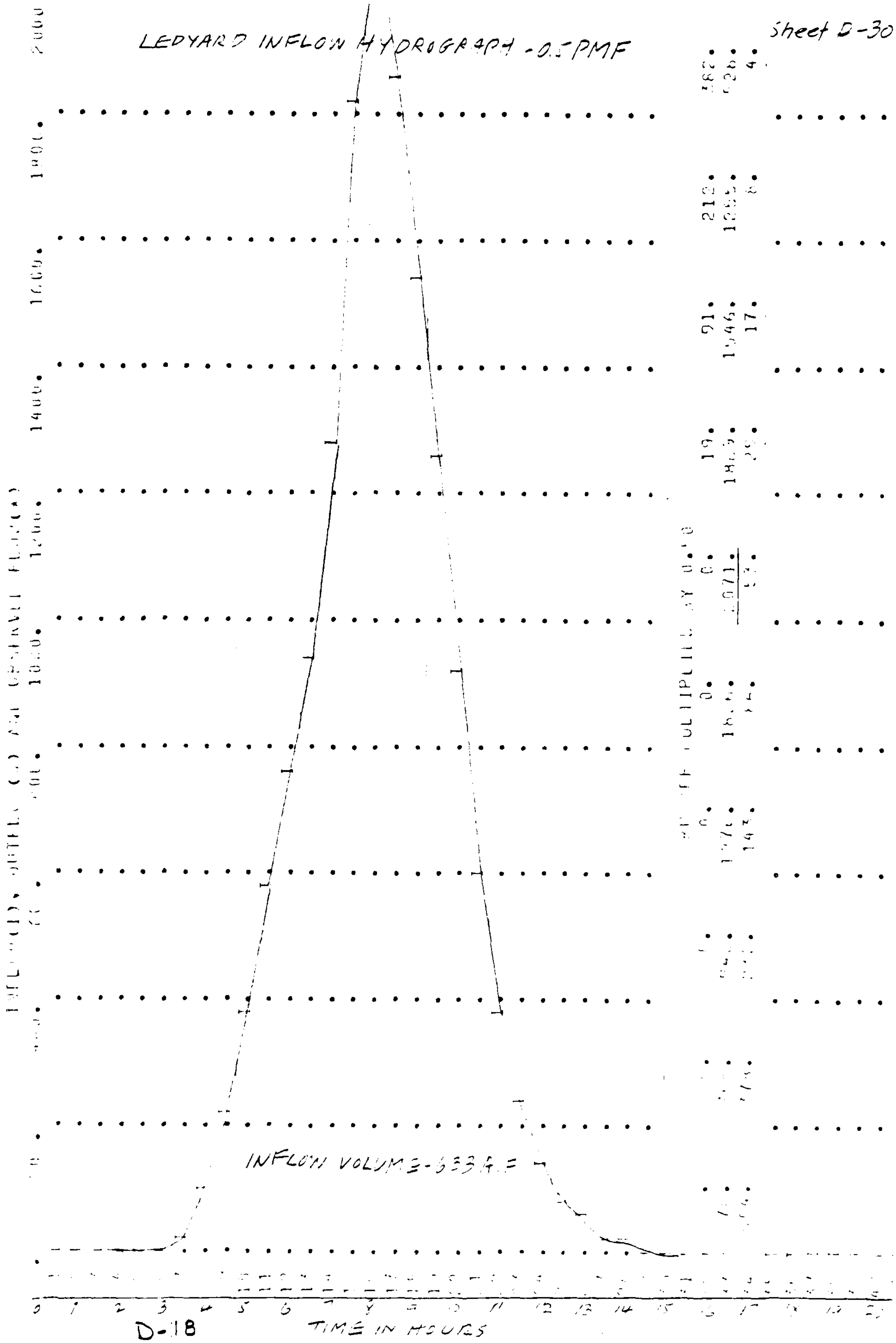
TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT
1	0.	0.	0.	27	1247.	383.	1176.	54	575.	0.	359.
2	0.	0.	0.	28	1214.	265.	1035.	55	560.	0.	350.
3	0.	0.	0.	29	1180.	185.	993.	56	546.	0.	341.
4	0.	1.	0.	30	1145.	124.	949.	57	532.	0.	332.
5	0.	1.	0.	31	1111.	87.	906.	58	518.	0.	324.
6	0.	6.	0.	32	1076.	58.	864.	59	505.	0.	315.
7	0.	[illegible]	0.	33	1043.	36.	823.	60	492.	0.	307.
8	0.	12.	0.	34	1011.	20.	782.	61	480.	0.	299.
9	5.	68.	2.	35	980.	10.	746.	62	467.	0.	292.
10	12.	213.	7.	36	950.	5.	717.	63	456.	0.	284.
11	51.	471.	19.	37	921.	2.	687.	64	444.	0.	277.
12	4.	837.	40.	38	895.	0.	659.	65	433.	0.	270.
13	115.	1271.	72.	39	866.	0.	631.	66	422.	0.	263.
14	1?3.	1756.	114.	40	841.	1.	605.	67	411.	0.	257.
15	[illegible]	[illegible]	170.	41	816.	1.	580.	68	400.	0.	250.
16	[illegible]	[illegible]	246.	42	793.	0.	555.	69	390.	0.	244.
17	[illegible]	[illegible]	343.	43	770.	0.	532.	70	380.	0.	237.
18	[illegible]	[illegible]	486.	44	749.	0.	510.	71	371.	0.	231.
19	[illegible]	4771.	667.	45	728.	0.	489.	72	361.	0.	225.
20	[illegible]	[illegible]	851.	46	708.	0.	468.	73	352.	0.	220.
21	1166.	[illegible]	976.	47	689.	0.	449.	74	343.	0.	214.
22	[illegible]	[illegible]	1076.	48	671.	0.	430.	75	334.	0.	209.
23	[illegible]	[illegible]	1144.	49	654.	0.	412.	76	326.	0.	203.
24	[illegible]	[illegible]	1161.	50	637.	0.	395.	77	317.	0.	198.
25	[illegible]	1140.	1160.	51	621.	0.	380.	78	309.	0.	193.
26	[illegible]	794.	1141.	52	605.	0.	372.	79	302.	0.	188.
27	1276.	[illegible]	1112.	53	590.	0.	368.	80	294.	0.	183.

D-16

ROUTING OF 0.5 PMF MORGAN POND INFLOW THRU MORGAN POND RESERVOIR

Sheet D-29




LEDYARD INFLOW HYDROGRAPH - 0.5 PMF
INFLOW VOLUME - 633 A.F.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TIME IN HOURS

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

COMBINE HYDROGRAPHS

MORGAN POND RESERVOIR OUTFLOW PLUS LEDYARD AREA INFLOW HYDROGRAPH
0.5PMF

[illegible] HYDROGRAPHS

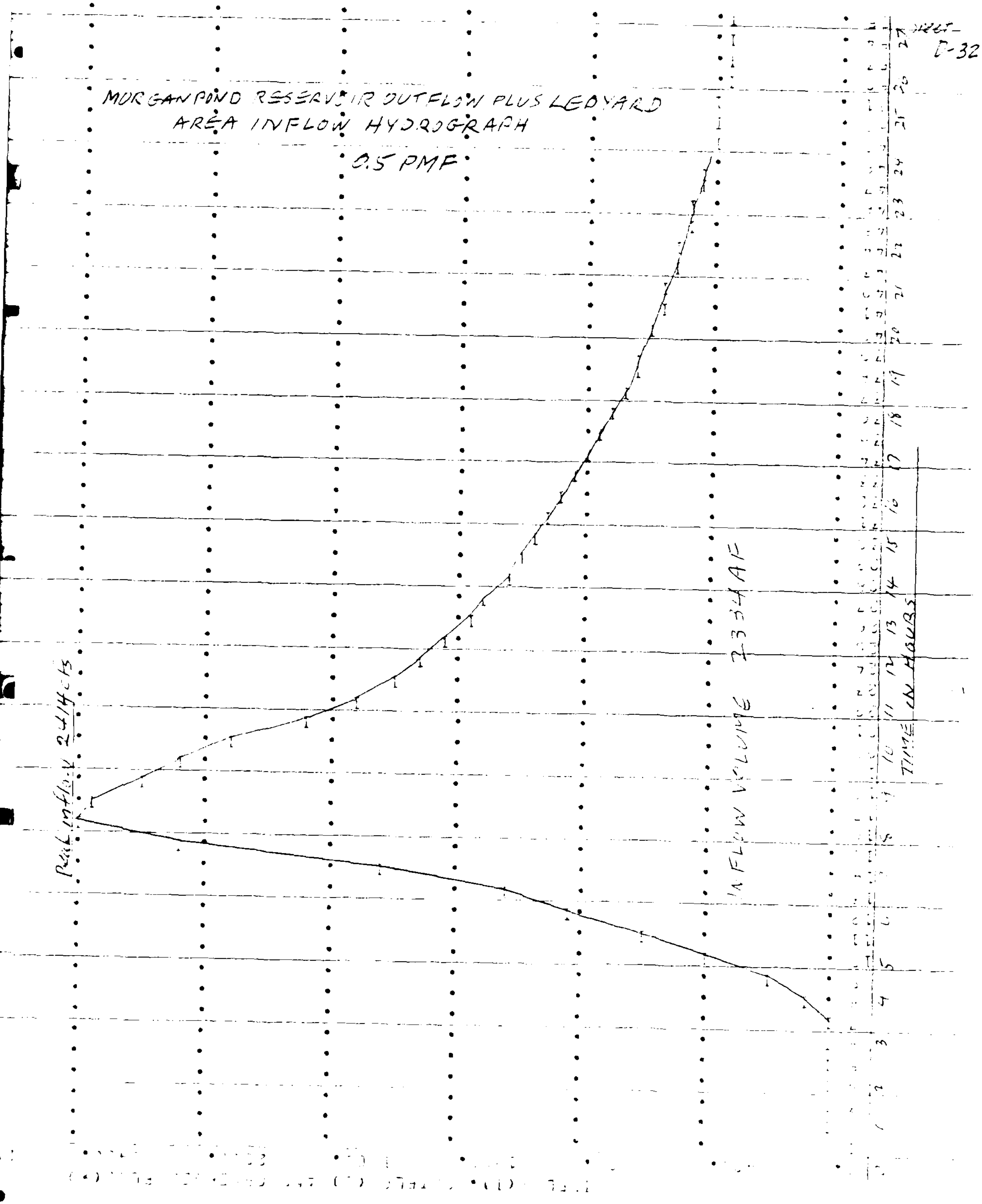
ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

[illegible]	0.	0.	0.	0.	0.	19.	93.	220.	401.
[illegible]	[illegible]	[illegible]	1447.	[illegible]	2414.	2357.	2213.	2080.	1964.
1681.	[illegible]	[illegible]	[illegible]	[illegible]	1165.	[illegible]	1052.	1006.	953.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	717.	687.	659.	631.	605.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	468.	449.	430.	412.	396.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	341.	[illegible]	324.	[illegible]	307.
[illegible]	[illegible]	284.	277.	270.	263.	257.	250.	244.	237.
[illegible]	[illegible]	220.	214.	[illegible]	203.	198.	193.	188.	183.
[illegible]	174.	170.	[illegible]	161.	157.	153.	149.	145.	142.
[illegible]	[illegible]	131.	[illegible]	[illegible]	121.	118.	115.	112.	109.
107.	[illegible]	101.	[illegible]	[illegible]	94.	91.	89.	87.	85.
[illegible]	[illegible]	78.	76.	74.	72.	71.	69.	67.	65.
[illegible]	[illegible]	[illegible]	[illegible]	57.	[illegible]	[illegible]	53.	52.	51.
[illegible]	[illegible]	47.	[illegible]	44.	43.	42.	41.	40.	39.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	32.	31.	30.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2414.	1861.	[illegible]	392.	56442.
INCHES		[illegible]	8.67	8.45	8.45
AC-FT		[illegible]	1542.	2334.	2334.

Sheet D-31


D-32
MORGAN POND RESERVOIR OUTFLOW PLUS LEDYARD AREA INFLOW HYDROGRAPH
0.5 PMF
Peak inflow 2414 cfs
INFLOW VOLUME 2334 AF
TIME IN HOURS

HYDROGRAPH ROUTING

ROUTE TO [illegible] RESERVOIR OF 0.5PMF INFLOWS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
[illegible]	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
[illegible].0	[illegible].	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

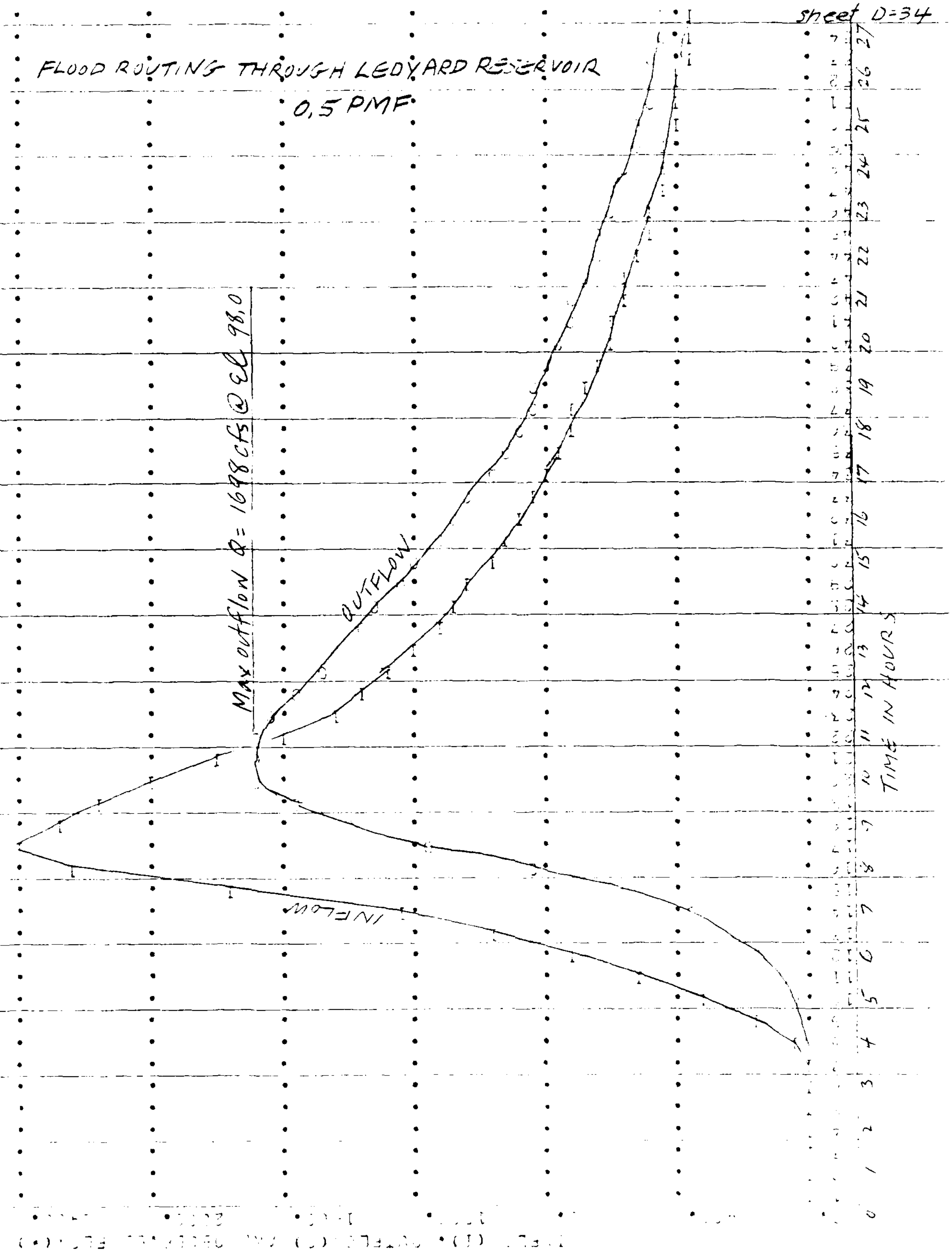
[illegible].	154.	[illegible]40.	599.	544.	695.	733.	850.	929.	1092.
[illegible].	31[illegible].	677.	171[illegible].	[illegible]60.	[illegible]91[illegible].	4270.	5163.	8527.	17452.

TIME	EOP STOR	AVG IN	EOP OUT								
				[illegible]	541.	1135.	1366.	[illegible]	[illegible]59.	[illegible]64.	[illegible]45.
1	0.	0.	0.	[illegible]	551.	1076.	1302.	[illegible]	155.	[illegible]54.	470.
[illegible]	0.	0.	0.	[illegible]	510.	1026.	1241.	56	152.	345.	416.
[illegible]	0.	0.	0.	[illegible]	511.	977.	1182.	57	149.	336.	[illegible]
[illegible]	0.	0.	0.	[illegible]	501.	930.	1127.	[illegible]	146.	32[illegible].	[illegible]1.
[illegible]	0.	0.	0.	[illegible]	[illegible]	886.	1073.	[illegible]	143.	31[illegible].	[illegible]
[illegible]	0.	[illegible].	0.	[illegible]	[illegible]4.	843.	1022.	60	141.	311.	[illegible]8.
[illegible]	0.	1[illegible].	1.	[illegible]	[illegible]7[illegible].	80[illegible].	974.	61	138.	30[illegible].	[illegible]8.
[illegible]	[illegible].	[illegible].	[illegible].	[illegible]	[illegible]68.	75[illegible].	[illegible]27.	62	136.	29[illegible].	[illegible]4[illegible].
[illegible]	[illegible].	157.	71.	[illegible]	[illegible]21.	732.	884.	63	134.	28[illegible].	[illegible]58.
1[illegible]	[illegible]6.	51[illegible].	49.	[illegible]	[illegible]54.	702.	[illegible]	64	131.	[illegible]1.	[illegible]
1[illegible]	[illegible].	[illegible]11.	[illegible].	[illegible]	[illegible]47.	67[illegible].	[illegible]	[illegible]	129.	274.	[illegible]
1[illegible]	[illegible].	72[illegible].	174.	[illegible]	[illegible]41.	64[illegible].	795.	[illegible]	127.	267.	[illegible]11.
1[illegible]	[illegible]4.	[illegible]47.	[illegible]30.	[illegible]	[illegible]34.	616.	7[illegible].	67	125.	260.	[illegible]06.
[illegible]	1[illegible]4.	1[illegible].	[illegible]40.	[illegible]	[illegible]27.	[illegible].	7[illegible].	68	123.	253.	[illegible]91.
1[illegible]	1[illegible]6.	17[illegible].	[illegible]76.	[illegible]	[illegible]21.	567.	710.	69	121.	247.	[illegible]
1[illegible]	[illegible].	[illegible]43.	[illegible]41.	[illegible]	215.	544.	6[illegible]3.	70	119.	241.	[illegible]0.
[illegible]	[illegible].	[illegible].	1176.	[illegible]	208.	521.	657.	71	117.	[illegible].	[illegible]
[illegible]	[illegible].	[illegible].	1417.	[illegible]	202.	499.	6[illegible]2.	72	115.	22[illegible].	[illegible]0.
[illegible]	[illegible].	1[illegible].	1574.	[illegible]	1[illegible]7.	47[illegible].	607.	73	112.	[illegible]23.	[illegible]74.
[illegible]	[illegible].	1[illegible].	1671.	[illegible]	1[illegible]1.	45[illegible].	[illegible]3.	74	110.	217.	[illegible]9.
[illegible]	[illegible].	17[illegible].	1[illegible].	[illegible]	1[illegible]6.	43[illegible].	[illegible]56.	75	108.	211.	[illegible]3.
[illegible]	[illegible].	1[illegible]7.	1676.	[illegible]	180.	421.	537.	76	106.	20[illegible].	[illegible]
[illegible]	[illegible]4.	145[illegible].	1[illegible].	[illegible]	175.	40[illegible].	51[illegible].	77	105.	201.	[illegible]
[illegible]	[illegible]74.	174[illegible].	1[illegible].	[illegible]	171.	393.	49[illegible].	78	101.	19[illegible].	[illegible]47.
[illegible]	[illegible].	1[illegible].	14[illegible].		166.	383.	477.	79	99.	191.	[illegible]41.
[illegible]	[illegible].	1[illegible].	1431.	[illegible]	1[illegible].	375.	[illegible]1.	[illegible]	97.	186.	[illegible]3[illegible].

Sheet D-33

FLOOD ROUTING THROUGH LEDYARD RESERVOIR

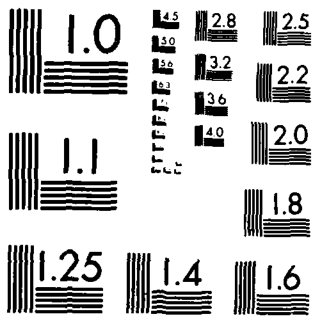
0.5 PMF



AD-A143 544 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS POQUONOCK DAM (CT 002..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV FEB 79 2/2

UNCLASSIFIED F/G 13/13 NL

END
FILMED
DTIC

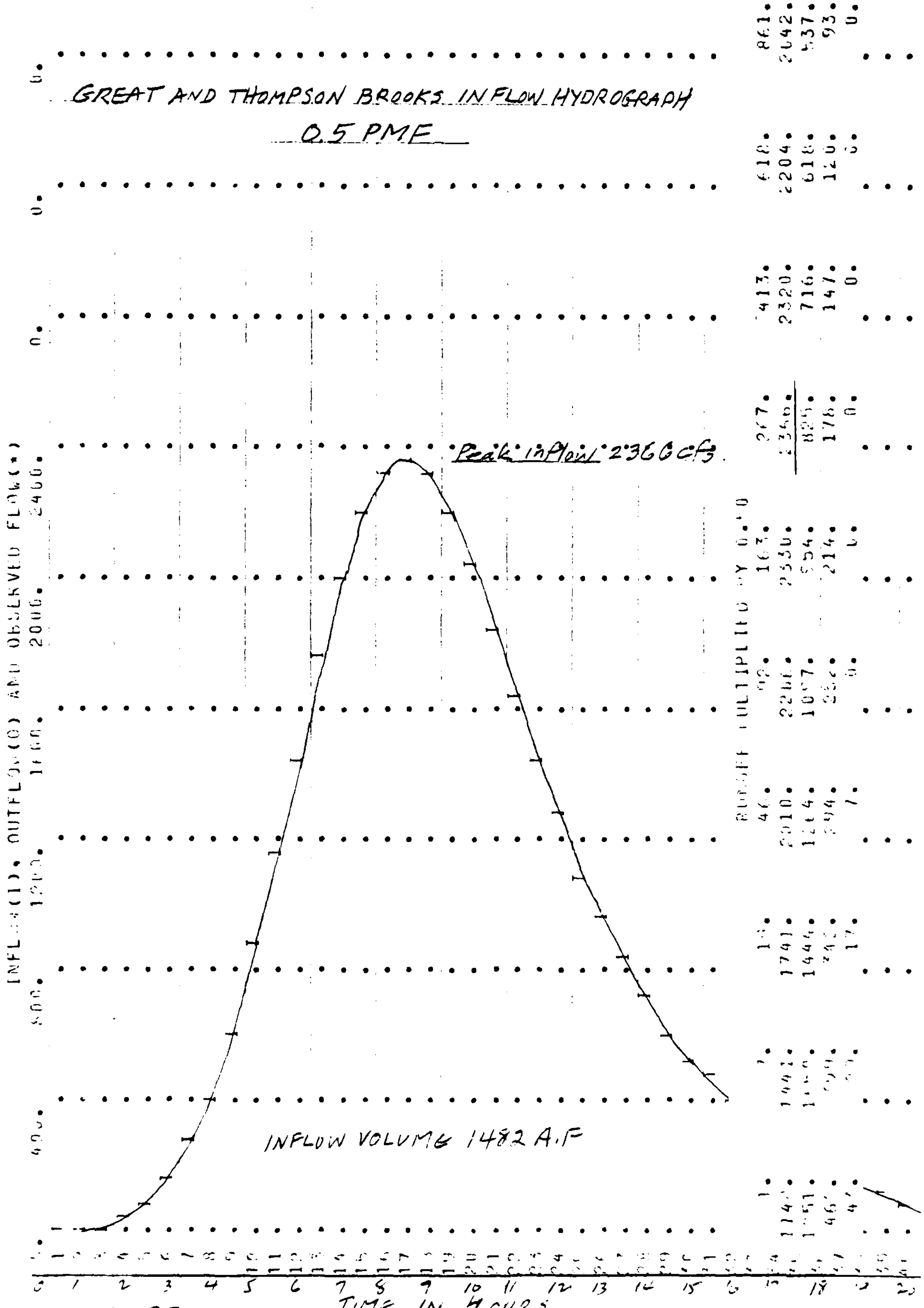


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Sheet D-35

GREAT AND THOMPSON BROOKS INFLOW HYDROGRAPH

0.5 PMF



D-23

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COMBINE HYDROGRAPHS

LEDYARD RESERVOIR OUTFLOW PLUS GREAT AND THUMPSON BR. INFLOW-0.5 PMF

SUM HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

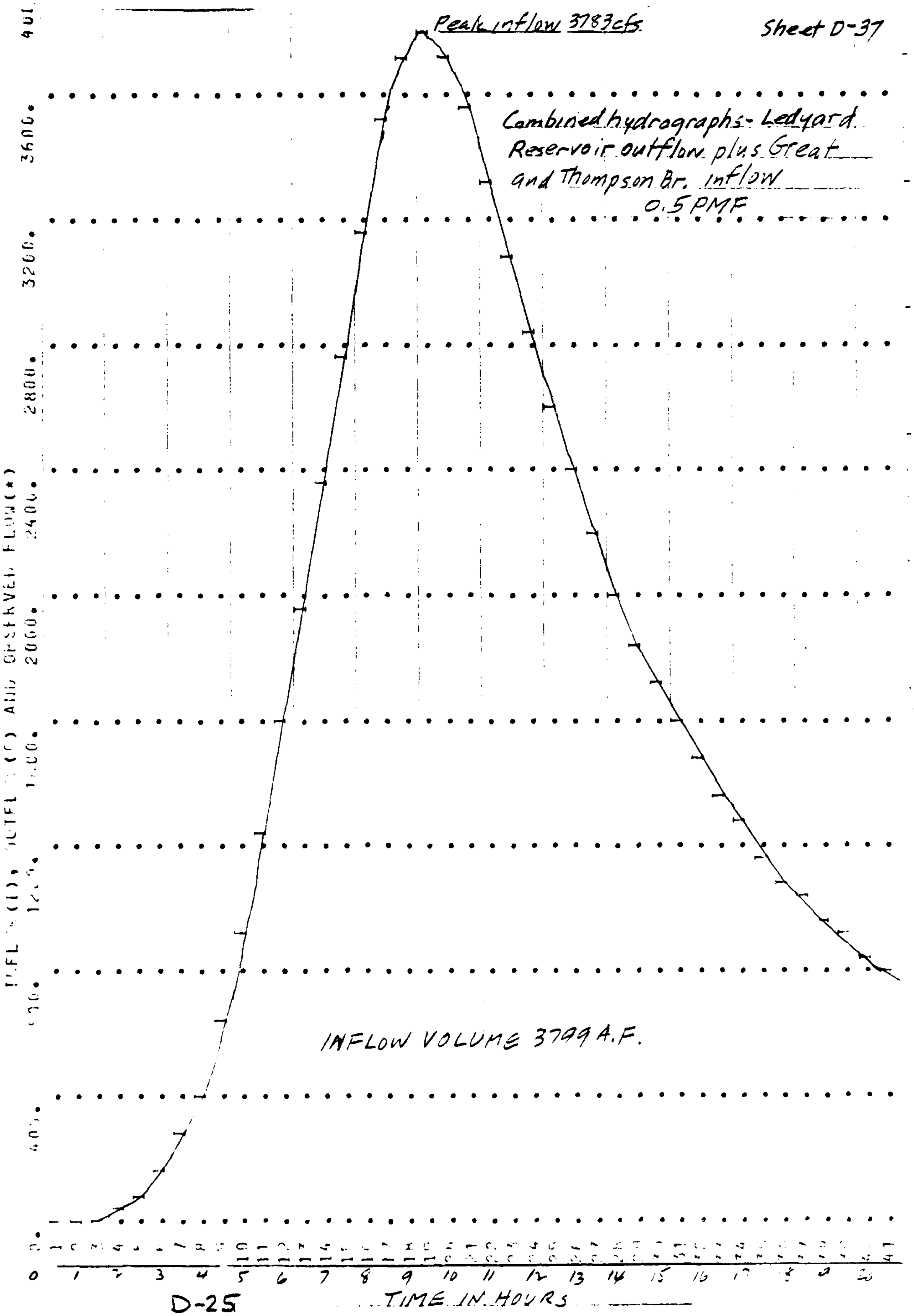
SUM OF 2 HYDROGRAPHS AT 0

1.	7.	19.	46.	92.	165.	268.	419.	638.	909.
1233.	1595.	1971.	2350.	2777.	3171.	3536.	3737.	3763.	3714.
3549.	3325.	3079.	2829.	2595.	2386.	2191.	2018.	1859.	1720.
1589.	1472.	1365.	1268.	1179.	1098.	1031.	971.	915.	859.
781.	739.	700.	664.	632.	607.	583.	560.	537.	516.
496.	477.	461.	445.	430.	416.	403.	391.	380.	368.
358.	348.	338.	329.	320.	311.	306.	301.	296.	290.
285.	280.	274.	269.	263.	258.	252.	247.	241.	236.
231.	226.	220.	215.	210.	205.	201.	196.	191.	187.
182.	178.	173.	169.	165.	161.	157.	153.	149.	146.
142.	139.	135.	132.	128.	125.	122.	119.	116.	113.
110.	107.	105.	102.	100.	97.	95.	92.	90.	88.
85.	83.	81.	79.	77.	75.	73.	71.	70.	68.
66.	64.	63.	61.	60.	58.	57.	55.	54.	52.
51.	50.	49.	47.	46.	45.	44.	43.	42.	40.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3763.	3206.	1578.	637.	91867.
INCHES		3.52	6.53	8.40	8.41
AC-FT		1591.	3132.	3793.	3799.

Sheet D-36

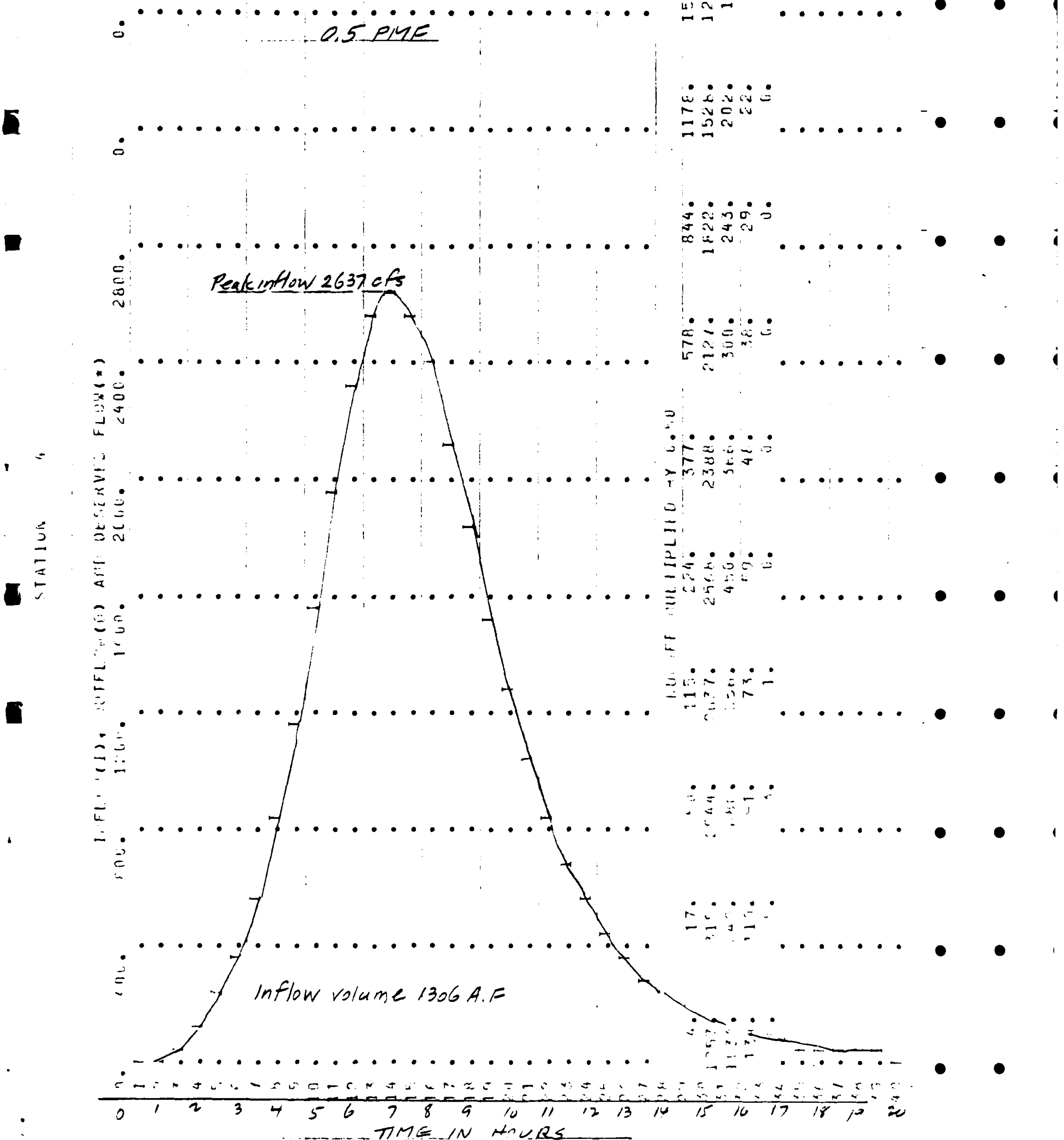
Sheet D-37



Peak inflow 3783cfs
Combined hydrographs - Ledyard Reservoir outflow plus Great and Thompson Br. inflow
0.5 PMF
INFLOW VOLUME 3799 A.F.
TIME IN HOURS

HEMPSTEAD AND BEAVERDAM BR. INFLOW HYDROGRAPH

0.5 PMF



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

COM. INF HYDROGRAPHS

GREAT AND THOMPSON BR OUTFLOWS PLUS HEMPSTEAD AND BEAVERDAM BR INFLOW

[illegible] HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

0.5 PMF

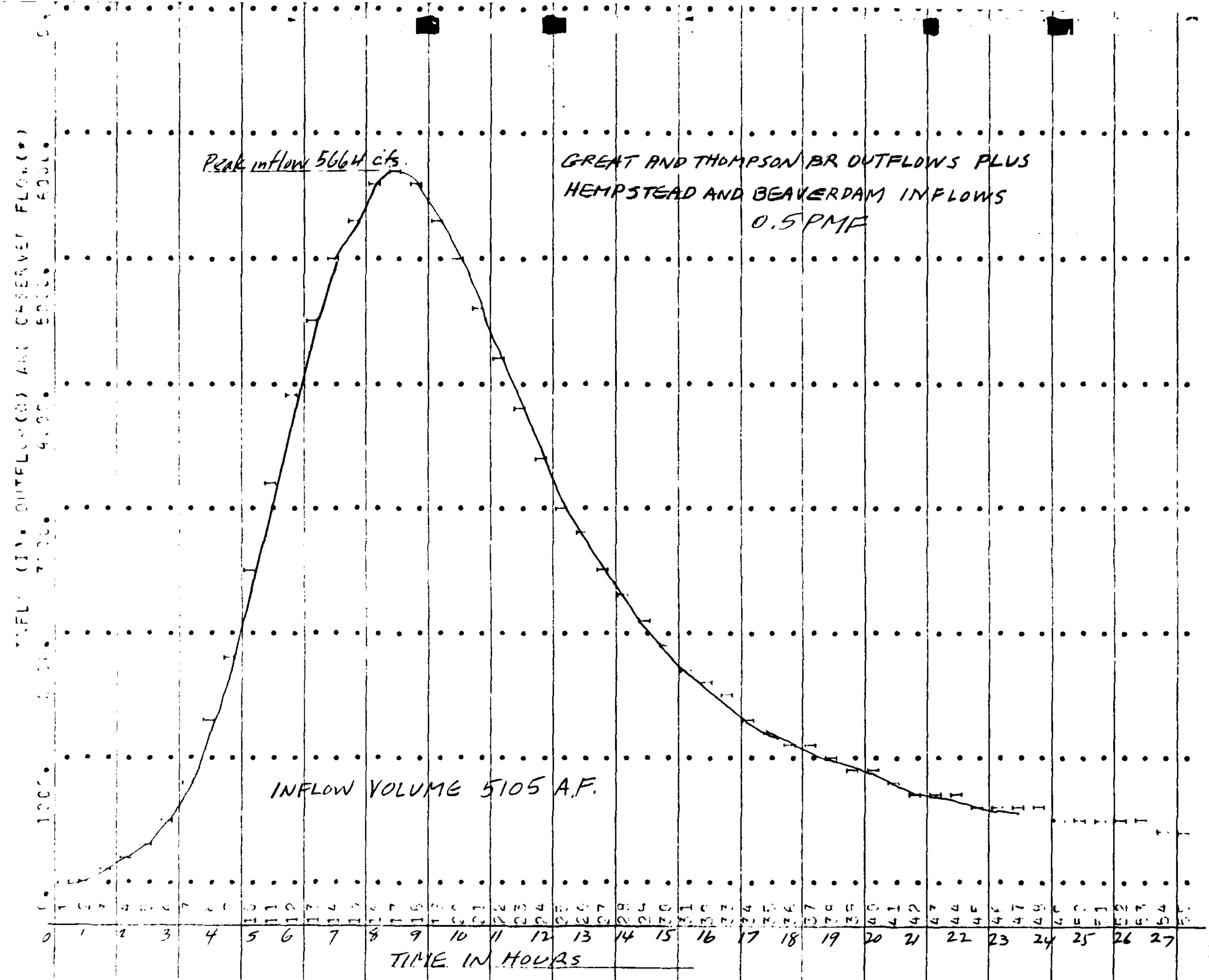
SUM OF 2 HYDROGRAPHS AT C

[illegible]	[illegible]3.	76.	161.	316.	541.	846.	1263.	1616.	2479.
3190.	[illegible]14.	4515.	4987.	5345.	5556.	5664.	5559.	5311.	4979.
4[illegible]84.	4167.	3757.	3385.	3045.	2752.	2491.	2262.	2061.	1666.
1723.	1[illegible]92.	1456.	1342.	1238.	1146.	1068.	1000.	937.	877.
78[illegible].	745.	703.	[illegible]65.	632.	607.	583.	560.	537.	516.
49[illegible].	477.	461.	446.	430.	416.	403.	391.	380.	368.
[illegible]	44[illegible].	336.	325.	320.	311.	306.	301.	296.	290.
28[illegible].	[illegible]	274.	26[illegible].	263.	258.	252.	247.	241.	236.
231.	226.	229.	215.	210.	205.	201.	196.	191.	187.
18[illegible].	17[illegible].	173.	169.	165.	161.	157.	153.	149.	146.
14[illegible].	13[illegible].	135.	132.	128.	125.	122.	119.	116.	113.
110.	108.	105.	102.	100.	97.	95.	92.	90.	88.
8[illegible].	[illegible]	81.	79.	77.	75.	73.	71.	70.	68.
66.	64.	65.	61.	60.	58.	57.	55.	54.	52.
51.	[illegible]	47.	47.	46.	45.	44.	43.	42.	40.

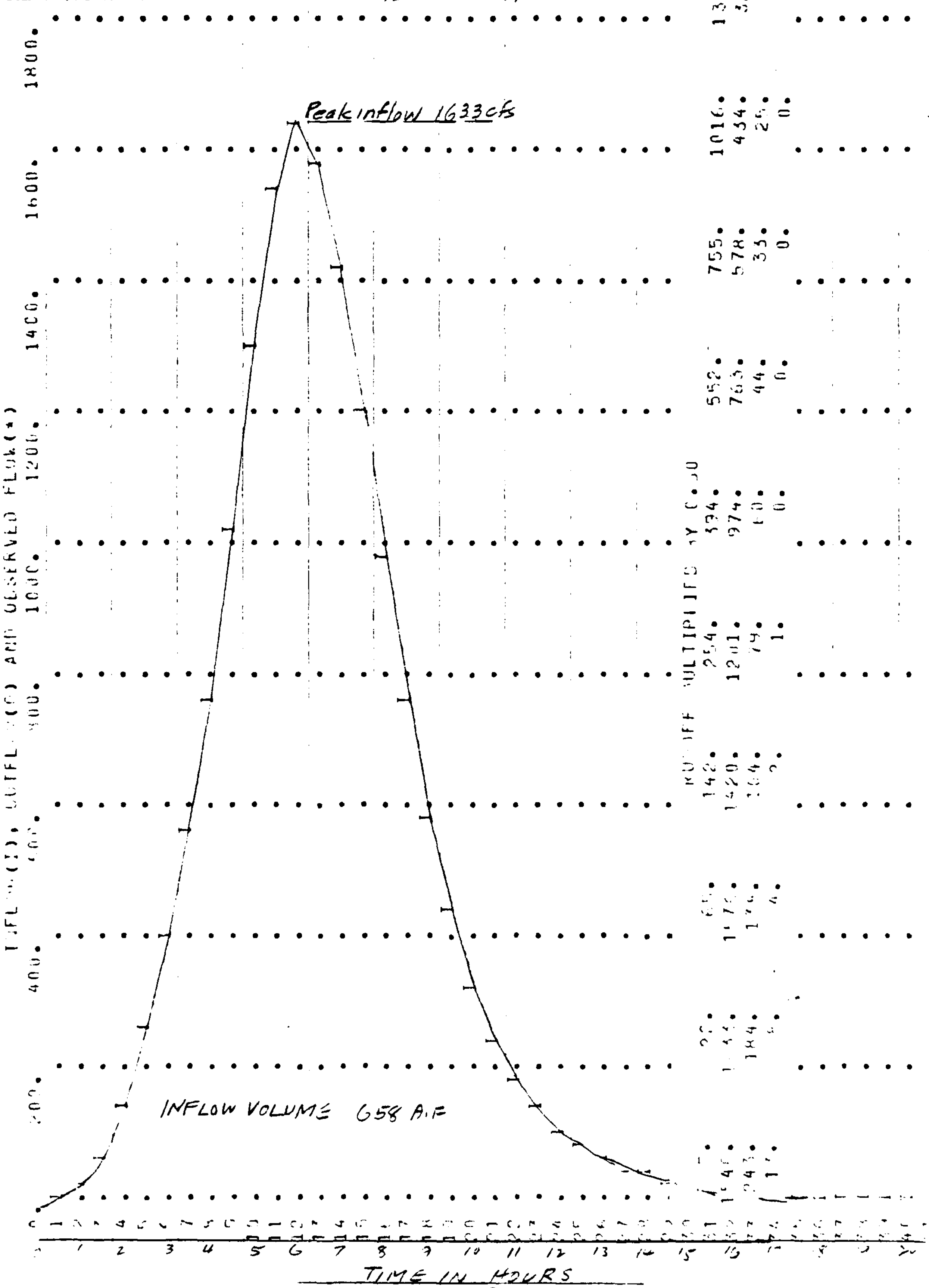
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5664.	4862.	2219.	856.	123481.
INCHES		4.00	7.31	8.46	8.47
AC-FT		2412.	4403.	5097.	5105.

D-27

Sheet D-39


Peak inflow 5664 cfs
GREAT AND THOMPSON BR OUTFLOWS PLUS
HEMPSTEAD AND BEAVERDAM INFLOWS
0.5PMF
INFLOW VOLUME 5105 A.F.
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
TIME IN HOURS

POHEGNUT AREA INFLOW HYDROGRAPH 0.5 PMF



HYDROGRAPH ROUTING

ROUTING THROUGH RESERVOIR - POHEGNUT RESERVOIR 0.5 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
55	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

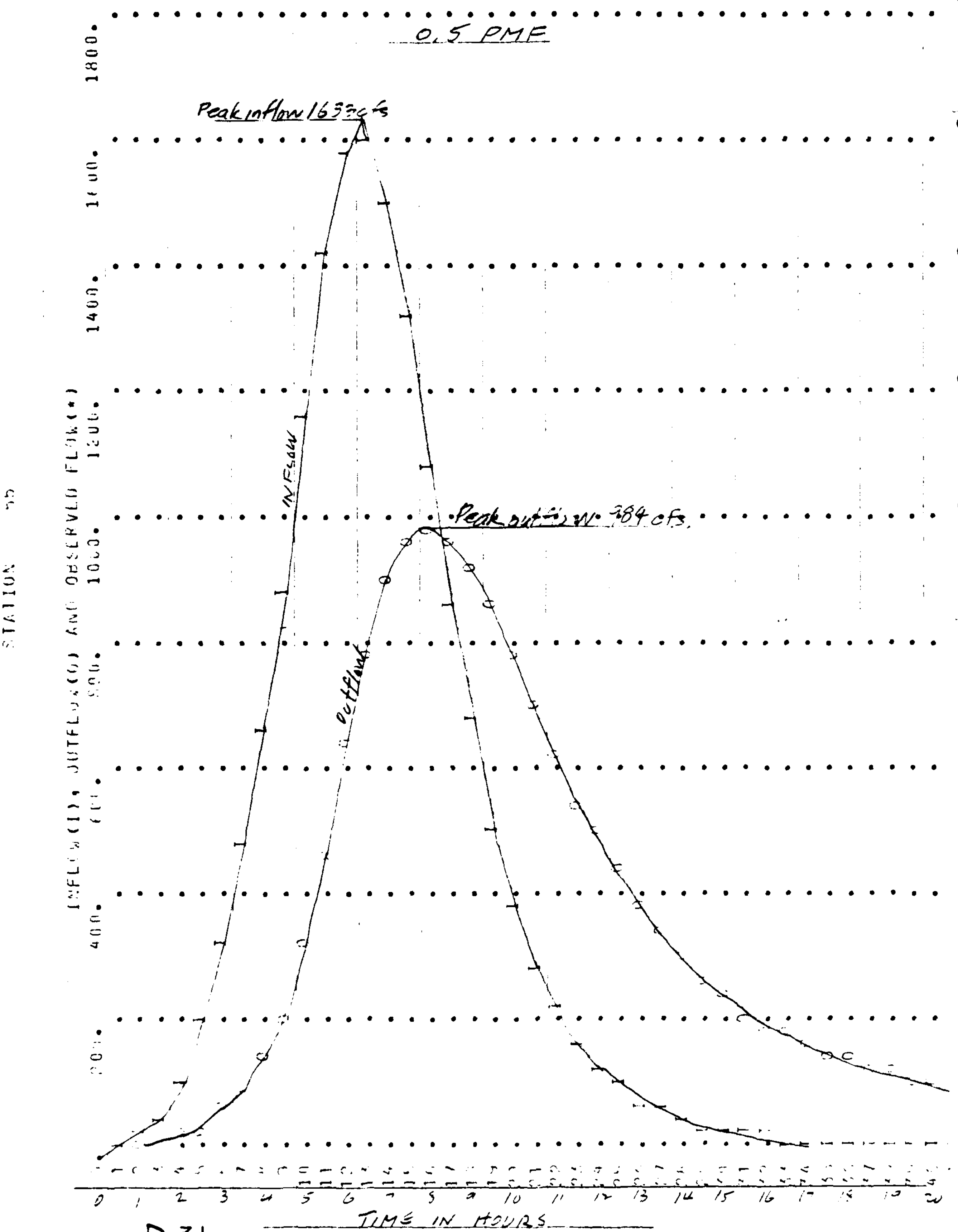
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	94.	1[illegible].	305.	522.	849.	909.	0.	0.
OUTFLOW=	0.	192.	543.	998.	1073.	2300.	5826.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT
1	0.	5.	0.	27	138.	52.	344.	54	14.	0.	29.
2	1.	13.	1.	28	126.	39.	304.	55	13.	0.	27.
3	2.	44.	5.	29	116.	29.	267.	56	12.	0.	24.
4	6.	103.	13.	30	106.	21.	235.	57	11.	0.	22.
5	14.	198.	28.	31	98.	15.	206.	58	10.	0.	21.
6	25.	324.	52.	32	90.	11.	184.	59	9.	0.	19.
7	42.	473.	86.	33	83.	6.	170.	60	9.	0.	17.
8	65.	654.	132.	34	77.	3.	157.	61	8.	0.	16.
9	94.	685.	194.	35	71.	2.	144.	62	7.	0.	15.
10	132.	1152.	322.	36	65.	1.	132.	63	7.	0.	14.
11	174.	1423.	458.	37	60.	0.	122.	64	6.	0.	12.
12	217.	1586.	631.	38	55.	0.	112.	65	6.	0.	11.
13	254.	1605.	766.	39	50.	0.	103.	66	5.	0.	11.
14	281.	1498.	899.	40	46.	0.	94.	67	5.	0.	10.
15	297.	1311.	964.	41	43.	0.	87.	68	4.	0.	9.
16	302.	1083.	984.	42	39.	0.	80.	69	4.	0.	8.
17	297.	857.	966.	43	36.	0.	73.	70	4.	0.	7.
18	286.	670.	919.	44	33.	0.	67.	71	3.	0.	7.
19	276.	506.	853.	45	30.	0.	62.	72	3.	0.	6.
20	262.	379.	778.	46	28.	0.	57.	73	3.	0.	6.
21	233.	285.	699.	47	26.	0.	52.	74	3.	0.	5.
22	215.	213.	622.	48	24.	0.	48.	75	2.	0.	5.
23	197.	161.	549.	49	22.	0.	44.	76	2.	0.	5.
24	181.	121.	491.	50	20.	0.	41.	77	2.	0.	4.
25	166.	91.	438.	51	18.	0.	37.	78	2.	0.	4.
26	151.	69.	389.	52	17.	0.	34.	79	2.	0.	4.
				53	15.	0.	32.	80	2.	0.	3.

Sheet D-42

HATCHING HOUSE BR. ROUTING THRU POHEGNUT RES



Sheet D-44

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

COMBINE HYDROGRAPHS

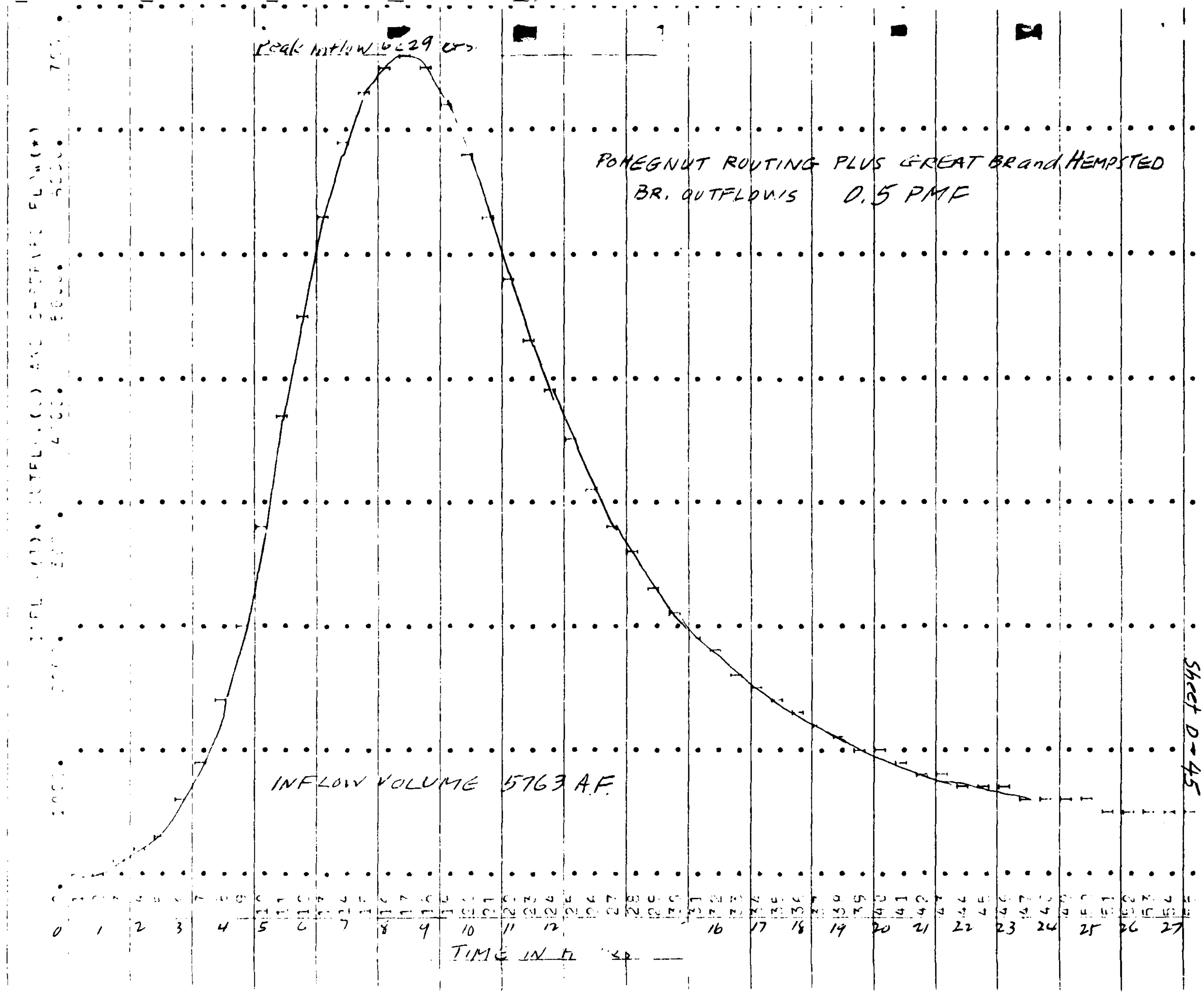
SUM HYDROGRAPHS – POHEGNUT ROUTING AND GREAT BROOK OUTFLOW 0.5 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 6

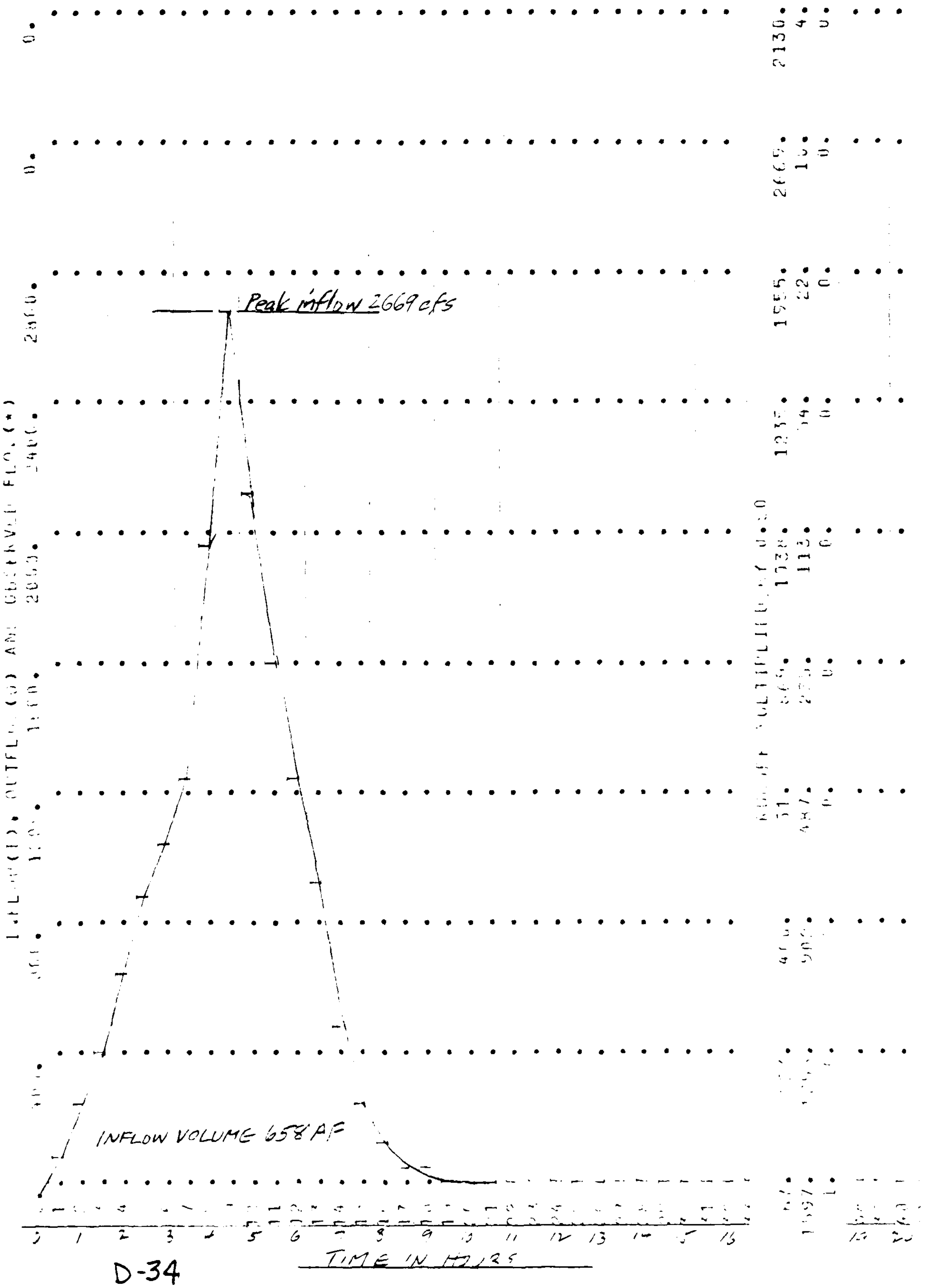
[illegible]	[illegible]	74.	174.	744.	592.	932.	1395.	2010.	2801.
[illegible]	[illegible]	[illegible]	[illegible]	6309.	6542.	6629.	6478.	6164.	5757.
5087.	4783.	4306.	3876.	3463.	3141.	2835.	2566.	2328.	2120.
1925.	1767.	1626.	1498.	1382.	1278.	1190.	1112.	1040.	971.
876.	824.	776.	733.	693.	664.	635.	608.	581.	556.
535.	512.	492.	474.	457.	441.	426.	412.	399.	386.
374.	363.	352.	341.	331.	322.	315.	310.	304.	298.
292.	286.	280.	274.	269.	262.	256.	251.	245.	239.
234.	228.	223.	218.	212.	207.	202.	197.	193.	188.
183.	179.	174.	170.	166.	162.	158.	154.	150.	146.
144.	139.	136.	132.	129.	126.	122.	119.	116.	113.
111.	108.	105.	102.	100.	97.	95.	92.	90.	88.
86.	83.	81.	79.	77.	75.	73.	71.	70.	68.
67.	64.	63.	61.	60.	58.	57.	55.	54.	52.
51.	50.	49.	47.	46.	45.	44.	43.	42.	41.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6629.	[illegible]	2542.	967.	139395.
INCHES		4.14	7.43	8.48	8.49
AC-FT		2811.	5044.	5755.	5763.


Sheet D-45
POMEGNUT ROUTING PLUS GREAT BRand HEMPSTED
BR. OUTFLOWS 0.5 PMF
Peak Inflow 6629 cfs
INFLOW VOLUME 5763 A.F.
TIME IN HRS.
0 1 2 3 4 5 6 7 8 9 10 11 12 16 17 18 19 20 21 22 23 24 25 26 27

Sheet D-46

INFLOW FROM POQUONOCK RES. AREA - 0.5 PMF



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

COMBINE HYDROGRAPHS

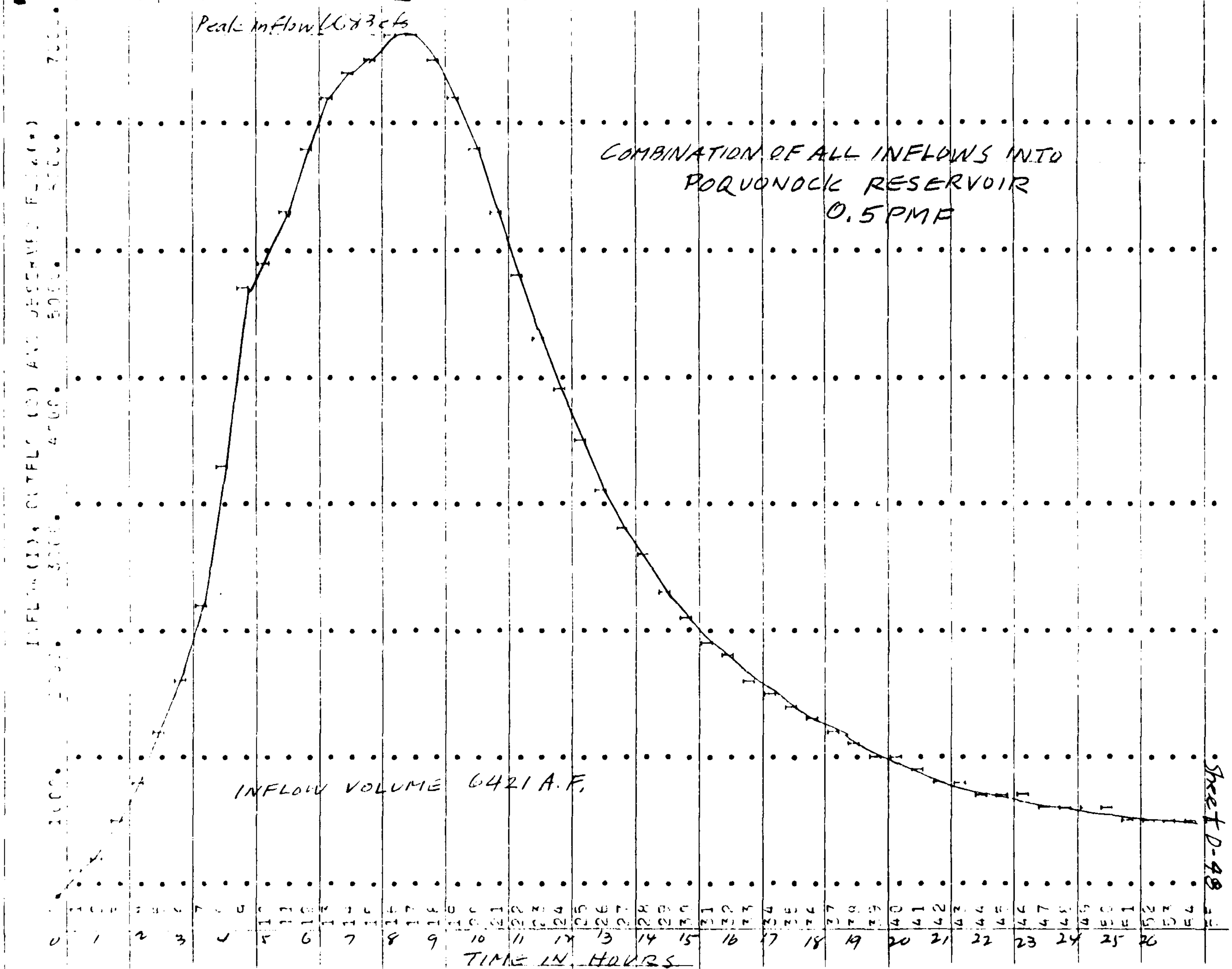
SU HYDROGRAPHS - COMBINATION OF ALL INFLOWS INTO POQUONOCK RESERVOIR - 0.5 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

72.	247.	475.	825.	1212.	1631.	2166.	3350.	4679.	4932.
5256.	5704.	6204.	6372.	6544.	6655.	6683.	6500.	6174.	5761.
5284.	4729.	4366.	3676.	3483.	3141.	2835.	2566.	2328.	2120.
1929.	1767.	1626.	1498.	1382.	1278.	1190.	1112.	1040.	971.
876.	824.	776.	733.	693.	664.	635.	608.	581.	556.
533.	512.	492.	474.	457.	441.	426.	412.	399.	386.
374.	363.	352.	341.	331.	322.	315.	310.	304.	298.
293.	286.	281.	274.	268.	262.	256.	251.	245.	239.
234.	226.	223.	215.	212.	207.	202.	197.	193.	188.
184.	179.	174.	170.	166.	162.	158.	154.	150.	146.
144.	140.	136.	132.	129.	126.	122.	119.	116.	113.
111.	108.	105.	102.	100.	97.	95.	92.	90.	88.
86.	83.	81.	79.	77.	75.	73.	71.	70.	68.
66.	64.	63.	61.	60.	58.	57.	55.	54.	52.
51.	50.	49.	47.	46.	45.	44.	43.	42.	41.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6683.	6014.	2849.	1077.	155315.
INCHES		3.99	7.49	8.49	8.56
AC-FT		2984.	5654.	6411.	6421.


Peak Inflow 6883 cfs
COMBINATION OF ALL INFLOWS INTO
POQUONOCK RESERVOIR
0.5PMF
INFLOW VOLUME 6421 A.F.
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
TIME IN HOURS
Sheet D-48

HYDROGRAPH ROUTING

FINAL ROUTING THROUGH POQUONOCK RESERVOIR 0.5 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
66	1	0	0	0	0	1

ROUTING DATA

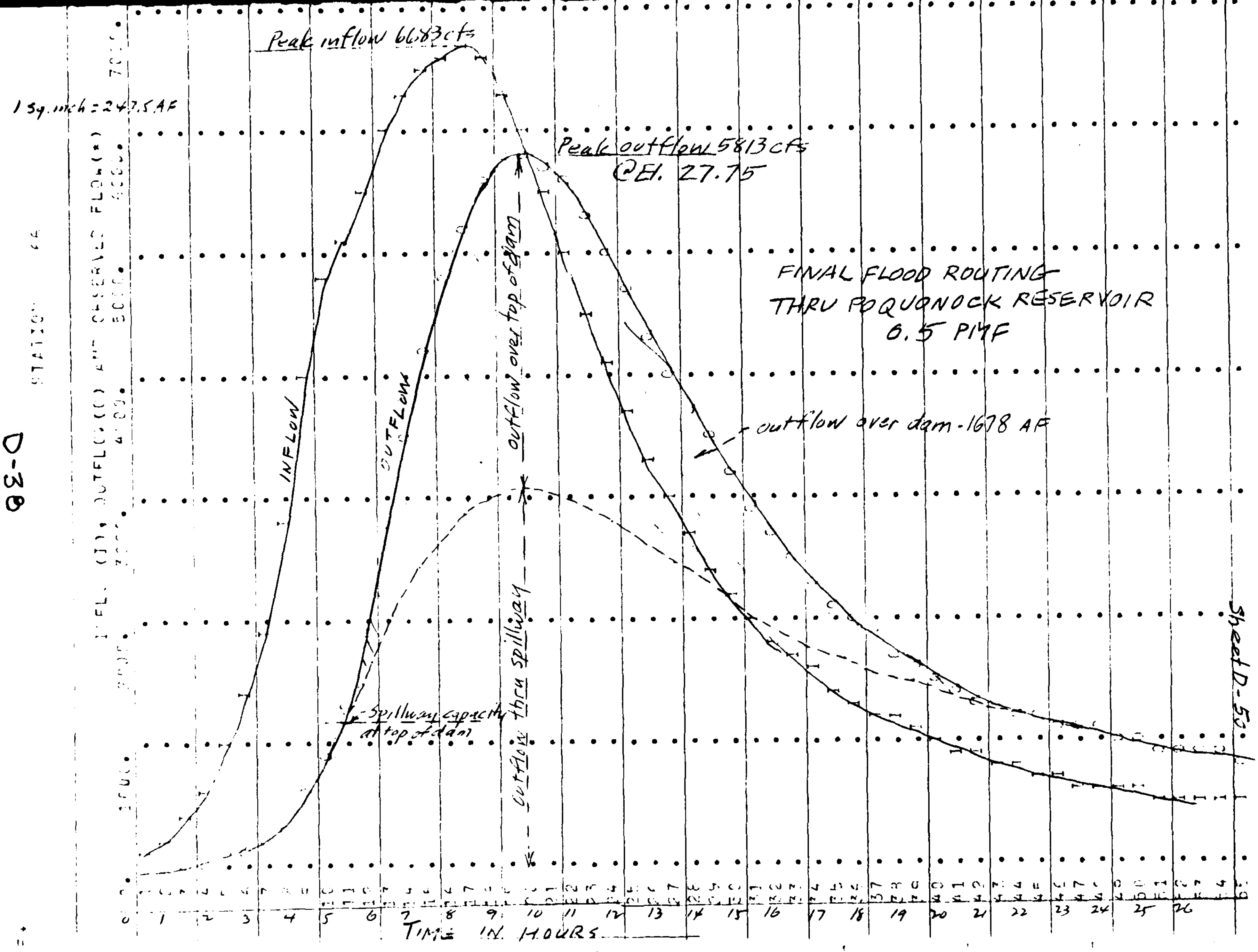
QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE =	0.	94.	192.	259.	402.	682.	808.	989.	1321.	1679.
OUTFLOW =	0.	53.	146.	224.	476.	1005.	1289.	2046.	3962.	6403.

TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT
				27	1328.	2983.	4010.	54	601.	485.	851.
1	3.	72.	2.	28	1280.	2700.	3724.	55	585.	465.	822.
2	9.	163.	5.	29	1235.	2447.	3452.	56	570.	447.	794.
3	34.	361.	13.	30	1187.	2224.	3190.	57	556.	433.	767.
4	50.	650.	28.	31	1144.	2025.	2942.	58	542.	419.	741.
5	[illegible]	1019.	50.	32	1104.	1848.	2709.	59	529.	405.	716.
6	146.	1422.	102.	33	1066.	1696.	2493.	60	516.	392.	691.
7	219.	1599.	177.	34	1032.	1562.	2295.	61	504.	380.	668.
8	322.	2758.	335.	35	1001.	1446.	2113.	62	492.	368.	645.
9	469.	4614.	602.	36	971.	1339.	1971.	63	480.	357.	624.
10	636.	4805.	918.	37	943.	1234.	1854.	64	469.	347.	603.
11	801.	5094.	1275.	38	916.	1151.	1742.	65	458.	336.	583.
12	963.	5533.	1938.	39	891.	1076.	1636.	66	448.	327.	564.
13	1114.	6003.	2767.	40	867.	1005.	1536.	67	439.	319.	545.
14	1244.	6288.	3517.	41	844.	925.	1438.	68	429.	313.	528.
15	1352.	6458.	4173.	42	821.	850.	1345.	69	421.	307.	511.
16	1440.	6599.	4772.	43	800.	803.	1272.	70	412.	301.	495.
17	1505.	6657.	5241.	44	780.	755.	1226.	71	404.	295.	480.
18	1537.	6592.	5574.	45	760.	713.	1180.	72	397.	289.	467.
19	1554.	6337.	5763.	46	740.	679.	1136.	73	389.	283.	454.
20	1553.	5963.	5813.	47	721.	649.	1092.	74	382.	277.	441.
21	1582.	5523.	5742.	48	702.	621.	1050.	75	375.	271.	429.
22	1556.	5036.	5567.	49	684.	594.	1010.	76	369.	265.	418.
23	1526.	4547.	5315.	50	667.	569.	976.	77	363.	259.	407.
24	1475.	4091.	5013.	51	649.	545.	943.	78	356.	255.	396.
25	1427.	3681.	4684.	52	633.	522.	912.	79	351.	248.	385.
26	1377.	3310.	4345.	53	616.	502.	881.	80	345.	242.	375.

Sheet D-49



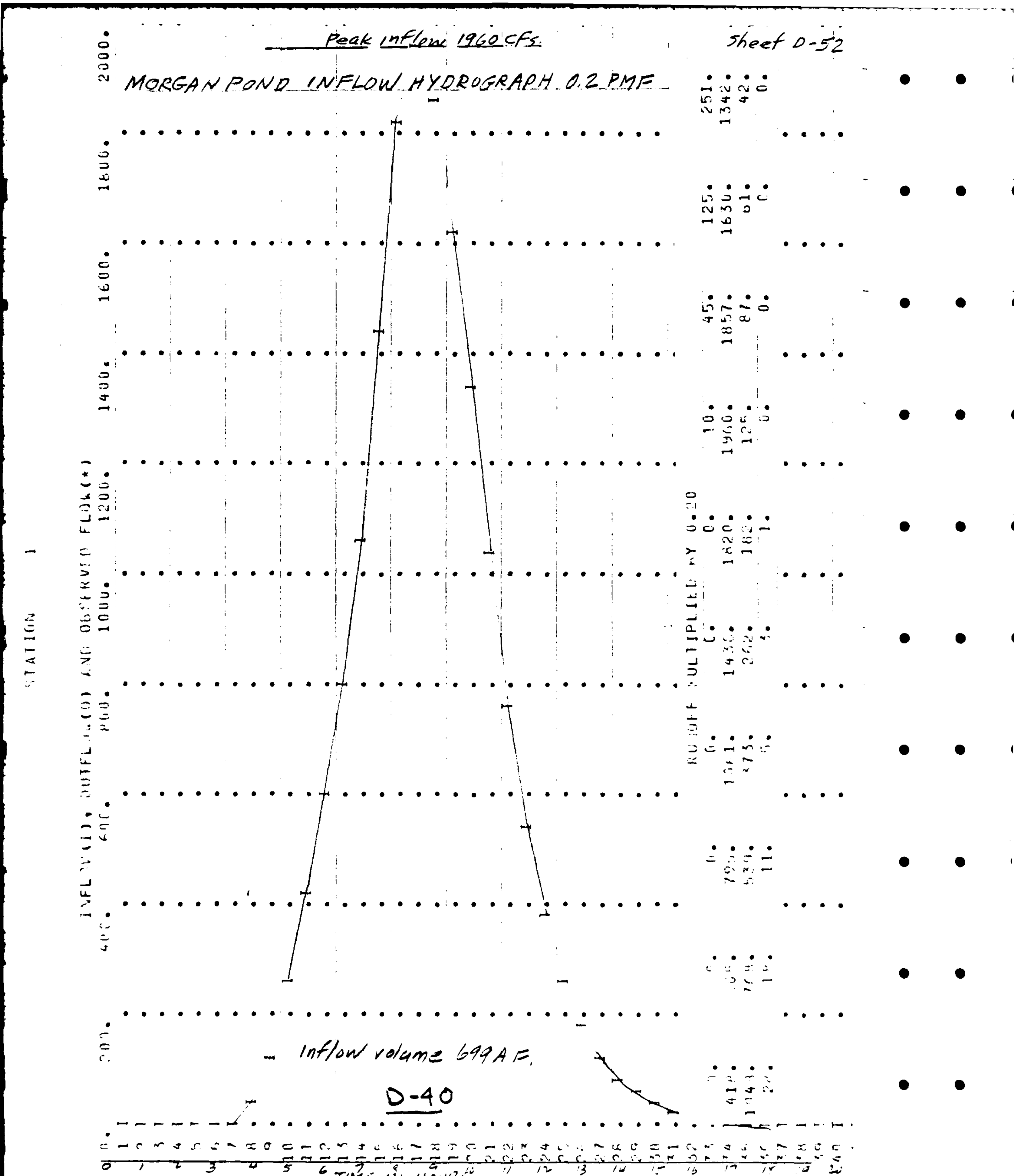
Peak inflow 6683cfs
1 sq. inch = 247.5 AF
Peak outflow 5813cfs @El. 27.75
FINAL FLOOD ROUTING
THRU POQUONOCK RESERVOIR
0.5 PMF
outflow over dam - 1678 AF
INFLOW
OUTFLOW
outflow over top of dam
outflow thru spillway
Spillway capacity at top of dam
TIME IN HOURS
Sheet D-50

Sheet D-51

SUMMARY FOR 0.5 PMF

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	1	4899.	3097.	881.	294.	3.80
ROUTED TO	11	1161.	1060.	640.	286.	3.80
HYDROGRAPH AT	2	2071.	1170.	319.	106.	1.38
2 COMBINED	0	2414.	1801.	528.	392.	5.18
ROUTED TO	22	1698.	1506.	881.	389.	5.18
HYDROGRAPH AT	3	2366.	1967.	747.	249.	3.29
2 COMBINED	0	3783.	3206.	1578.	637.	8.47
HYDROGRAPH AT	4	2637.	1992.	658.	219.	2.83
2 COMBINED	0	5664.	4862.	2219.	856.	11.30
HYDROGRAPH AT	5	1633.	1110.	331.	110.	1.43
ROUTED TO	55	584.	804.	323.	111.	1.43
2 COMBINED	0	6629.	5666.	2542.	967.	12.73
HYDROGRAPH AT	6	2169.	1266.	332.	111.	1.43
2 COMBINED	0	6683.	6014.	2849.	1077.	14.16
ROUTED TO	66	5813.	5167.	2620.	1056.	14.16



Peak inflow 1960 cfs.
Sheet D-52
MORGAN POND INFLOW HYDROGRAPH 0.2 PMF
STATION 1
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
RUNOFF MULTIPLIED BY 0.20
Inflow volume 699 AF.
D-40
TIME IN HOURS

D-41

HYDROGRAPH ROUTING

ROUTING THROUGH MORGAN POND OF 0.2 PMF INFLOW

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
11	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

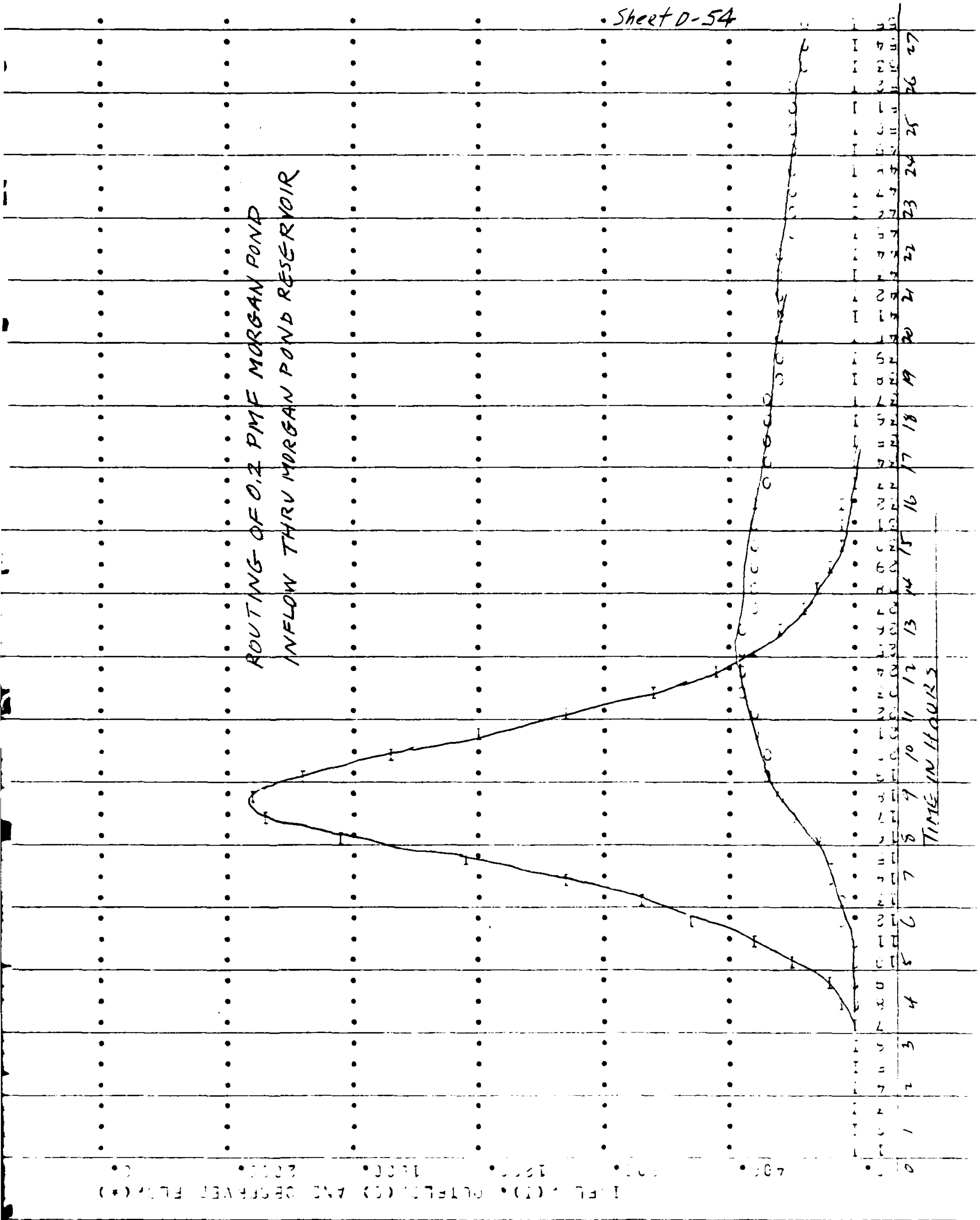
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	644.	1000.	1373.	1761.	2572.	2994.	3426.	3536.	3973.
OUTFLOW=	0.	402.	769.	1232.	1744.	3024.	3756.	4482.	4670.	9391.

TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT
1	0.	0.	0.	27	538.	155.	336.	54	275.	0.	172.
2	0.	0.	0.	28	529.	106.	330.	55	268.	0.	167.
3	0.	0.	0.	29	518.	74.	324.	56	261.	0.	163.
4	0.	0.	0.	30	507.	52.	317.	57	255.	0.	159.
5	0.	0.	0.	31	496.	35.	310.	58	248.	0.	155.
6	0.	0.	0.	32	484.	23.	302.	59	242.	0.	151.
7	0.	5.	0.	33	472.	14.	295.	60	236.	0.	147.
8	1.	27.	1.	34	461.	8.	288.	61	230.	0.	143.
9	5.	85.	3.	35	449.	4.	280.	62	224.	0.	140.
10	12.	188.	8.	36	438.	2.	273.	63	218.	0.	136.
11	26.	335.	16.	37	427.	1.	266.	64	213.	0.	133.
12	46.	512.	29.	38	416.	0.	260.	65	207.	0.	129.
13	73.	701.	46.	39	405.	0.	253.	66	202.	0.	126.
14	109.	922.	68.	40	395.	0.	247.	67	197.	0.	123.
15	157.	1250.	98.	41	385.	0.	240.	68	192.	0.	120.
16	220.	1520.	137.	42	375.	0.	234.	69	187.	0.	117.
17	291.	1804.	182.	43	366.	0.	228.	70	182.	0.	114.
18	362.	1803.	226.	44	356.	0.	222.	71	178.	0.	111.
19	424.	1745.	265.	45	347.	0.	217.	72	173.	0.	108.
20	474.	1466.	296.	46	338.	0.	211.	73	169.	0.	105.
21	510.	1191.	319.	47	330.	0.	206.	74	164.	0.	103.
22	534.	908.	334.	48	321.	0.	201.	75	160.	0.	100.
23	547.	655.	342.	49	313.	0.	195.	76	156.	0.	97.
24	552.	455.	345.	50	305.	0.	190.	77	152.	0.	95.
25	551.	313.	344.	51	297.	0.	186.	78	148.	0.	93.
26	[illegible]	[illegible]	341.	52	290.	0.	181.	79	144.	0.	90.
				53	282.	0.	176.	80	141.	0.	88.

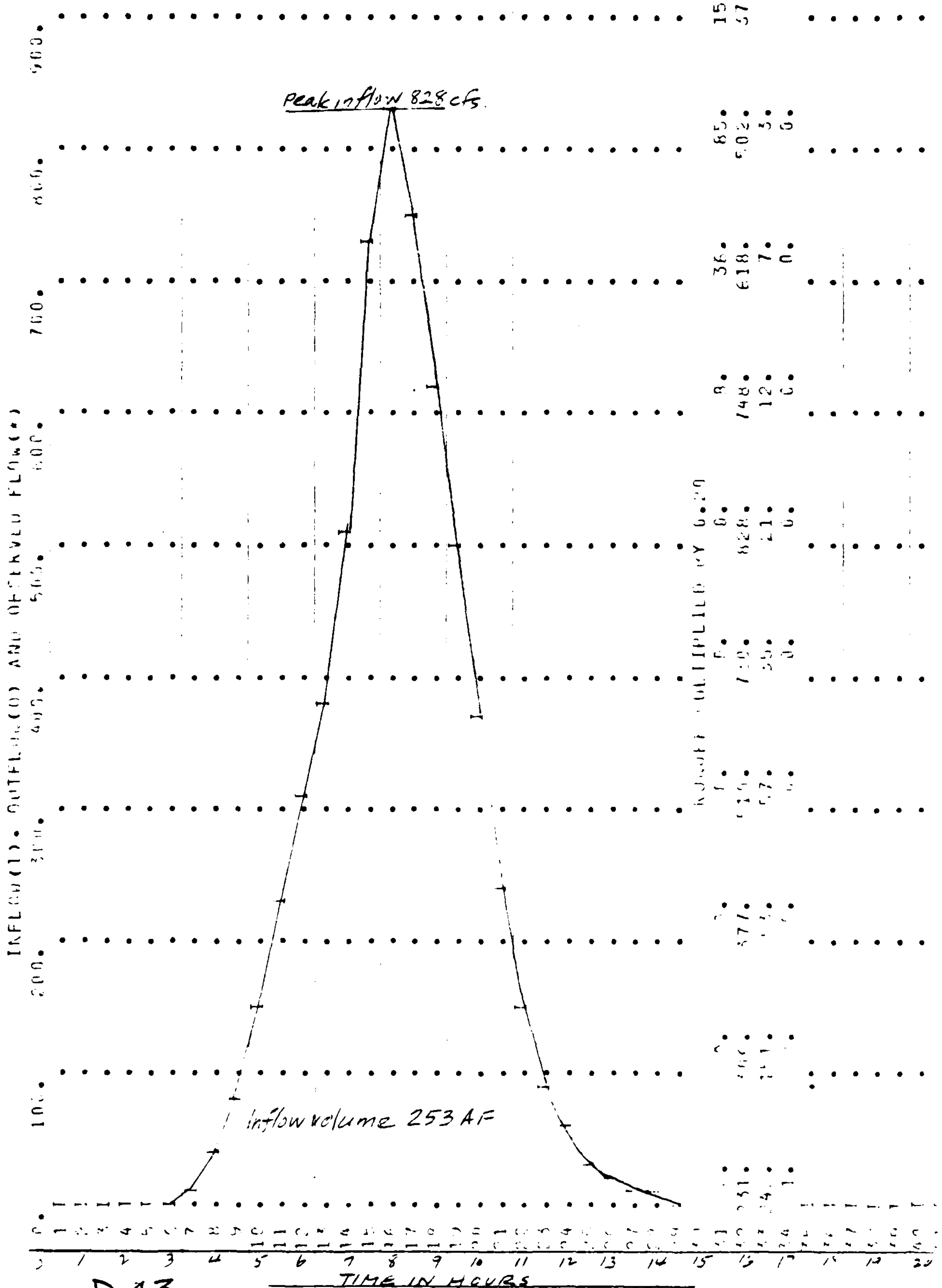
Sheet -53

Sheet D-54



ROUTING OF 0.2 PMF MORGAN POND
INFLOW THRU MORGAN POND RESERVOIR
TIME IN HOURS

LEDYARD INFLOW HYDROGRAPH - 0.2PMF



Sheet D-56

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COMBINE HYDROGRAPHS

SUM HYDROGRAPHS - MORGAN POND RESERVOIR OUTFLOW PLUS LEDYARD INFLOW HYDROGRAPH

0.2 PMF

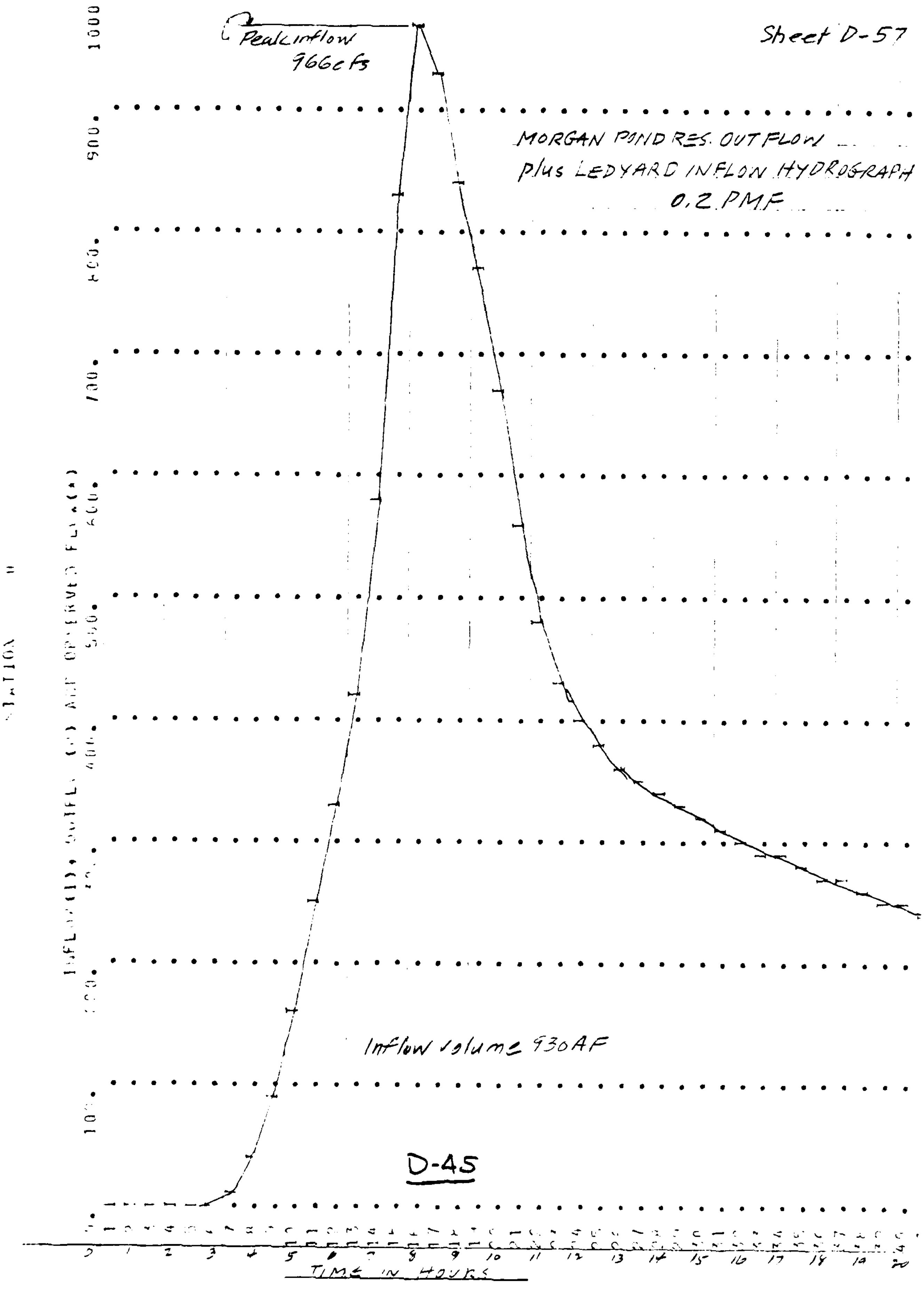
ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

0.	0.	0.	0.	0.	0.	8.	37.	88.	160.
247.	[illegible]	423.	579.	829.	966.	929.	844.	767.	667.
560.	485.	434.	402.	378.	362.	348.	337.	327.	318.
312.	[illegible]	295.	288.	280.	273.	266.	260.	253.	247.
240.	234.	228.	222.	217.	211.	206.	201.	195.	190.
186.	181.	176.	172.	167.	163.	159.	155.	151.	147.
143.	149.	136.	133.	129.	126.	123.	120.	117.	114.
111.	109.	105.	103.	100.	97.	95.	93.	90.	88.
86.	83.	81.	79.	77.	75.	73.	71.	70.	68.
65.	64.	63.	61.	60.	58.	57.	55.	54.	52.
51.	50.	49.	47.	46.	45.	44.	43.	42.	41.
[illegible]	[illegible]	38.	37.	36.	35.	34.	33.	32.	31.
31.	30.	29.	28.	28.	27.	26.	25.	25.	24.
24.	23.	22.	22.	21.	21.	20.	20.	19.	19.
18.	18.	17.	17.	16.	16.	16.	15.	15.	14.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	966.	657.	350.	156.	22485.
INCHES		1.18	2.52	3.36	3.36
AC-FT		326.	695.	930.	930.

Sheet D-57



D-45

HYDROGRAPH ROUTING

ROUTING THROUGH LEDYARD RESERVOIR OF 0.2 PMF INFLOWS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
22	1	0	0	0	0	1

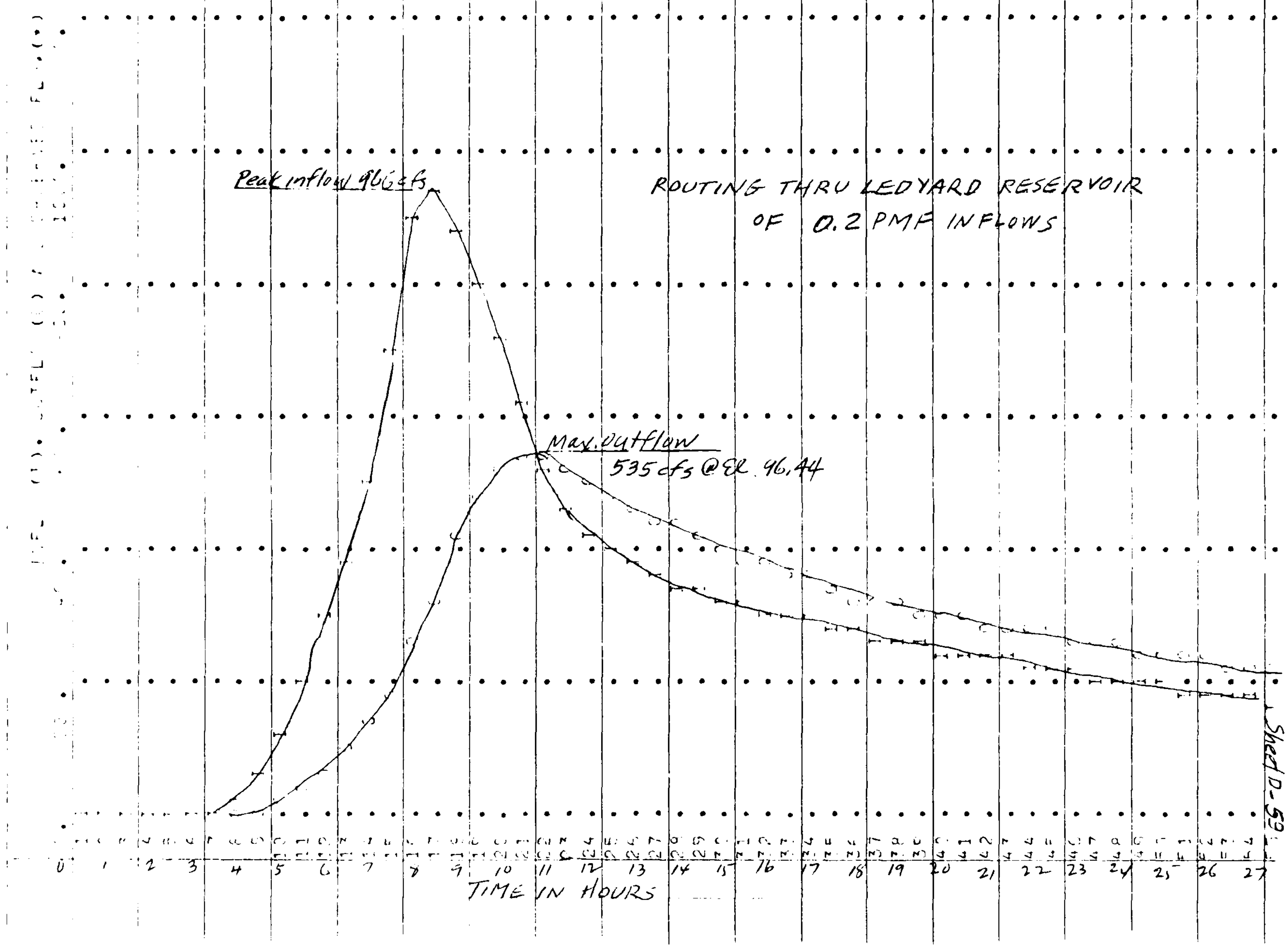
ROUTING DATA

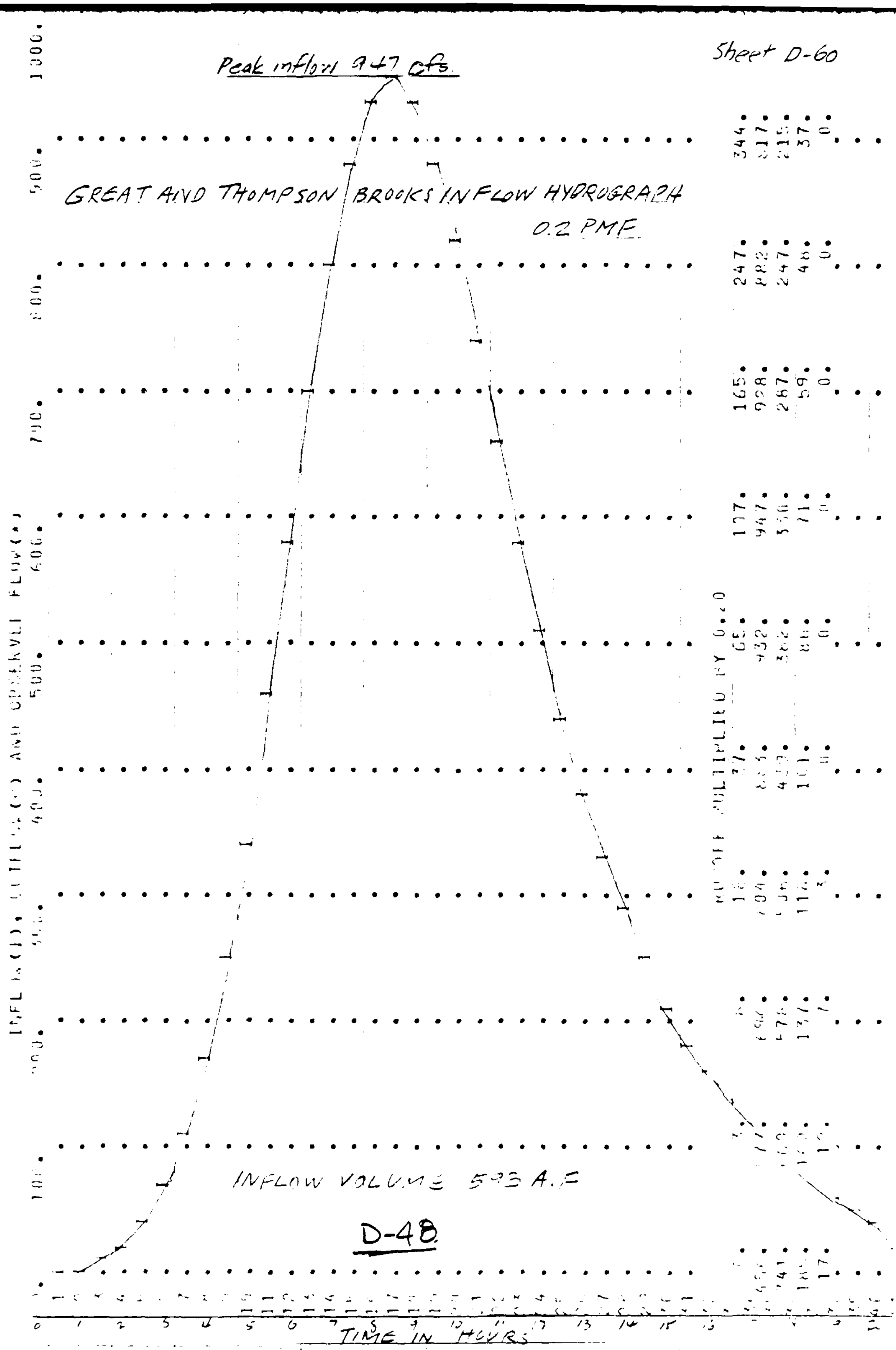
QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	137.	266.	399.	544.	695.	733.	850.	929.	1092.
OUTFLOW=	0.	311.	877.	1715.	2800.	3915.	4270.	5163.	8327.	17492.

TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT
				27	160.	355.	449.	54	91.	174.	223.
1	0.	0.	0.	28	156.	342.	432.	55	89.	170.	218.
2	0.	0.	0.	29	152.	332.	415.	56	87.	165.	213.
3	0.	0.	0.	30	148.	323.	400.	57	85.	161.	208.
4	0.	0.	0.	31	145.	314.	386.	58	83.	157.	203.
5	0.	0.	0.	32	142.	306.	373.	59	81.	153.	198.
6	0.	0.	0.	33	139.	295.	361.	60	79.	149.	194.
7	0.	4.	0.	34	136.	291.	350.	61	77.	145.	189.
8	1.	23.	2.	35	134.	284.	339.	62	76.	142.	184.
9	3.	63.	8.	36	132.	277.	329.	63	74.	138.	180.
10	8.	124.	19.	37	129.	270.	320.	64	72.	134.	176.
11	15.	204.	37.	38	127.	263.	310.	65	70.	131.	171.
12	25.	291.	61.	39	125.	256.	305.	66	68.	128.	167.
13	38.	379.	92.	40	123.	250.	300.	67	67.	124.	163.
14	54.	501.	131.	41	121.	243.	294.	68	65.	121.	159.
15	76.	704.	186.	42	118.	237.	289.	69	64.	118.	155.
16	104.	837.	254.	43	116.	231.	283.	70	62.	115.	151.
17	141.	943.	329.	44	114.	225.	278.	71	60.	112.	148.
18	173.	887.	419.	45	111.	220.	272.	72	59.	109.	144.
19	187.	685.	481.	46	109.	214.	267.	73	57.	107.	140.
20	176.	717.	520.	47	107.	209.	261.	74	56.	104.	137.
21	180.	614.	535.	48	105.	203.	255.	75	55.	101.	133.
22	179.	522.	533.	49	102.	198.	250.	76	53.	99.	130.
23	176.	460.	521.	50	100.	193.	244.	77	52.	96.	127.
24	173.	418.	504.	51	98.	188.	239.	78	51.	94.	124.
25	168.	390.	486.	52	96.	183.	234.	79	49.	91.	121.
26	164.	370.	457.	53	94.	179.	228.	80	48.	89.	117.


ROUTING THRU LEDYARD RESERVOIR
OF 0.2 PMF INFLOWS
Peak inflow 966 cfs
Max. outflow
535 cfs @ El. 96.44
TIME IN HOURS
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
Sheet D-59


Peak inflow 947 cfs.
GREAT AND THOMPSON BROOKS INFLOW HYDROGRAPH
0.2 PMF
INFLOW VOLUME 593 A.F
D-48
TIME IN HOURS
STATION
1000.
900.
800.
700.
600.
500.
400.
100.
344.
247.
165.
947.

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

COMBINE HYDROGRAPHS

LEDYARD RESERVOIR OUTFLOW PLUS GREAT AND THOMPSON BR. INFLOW 0.2 PMF

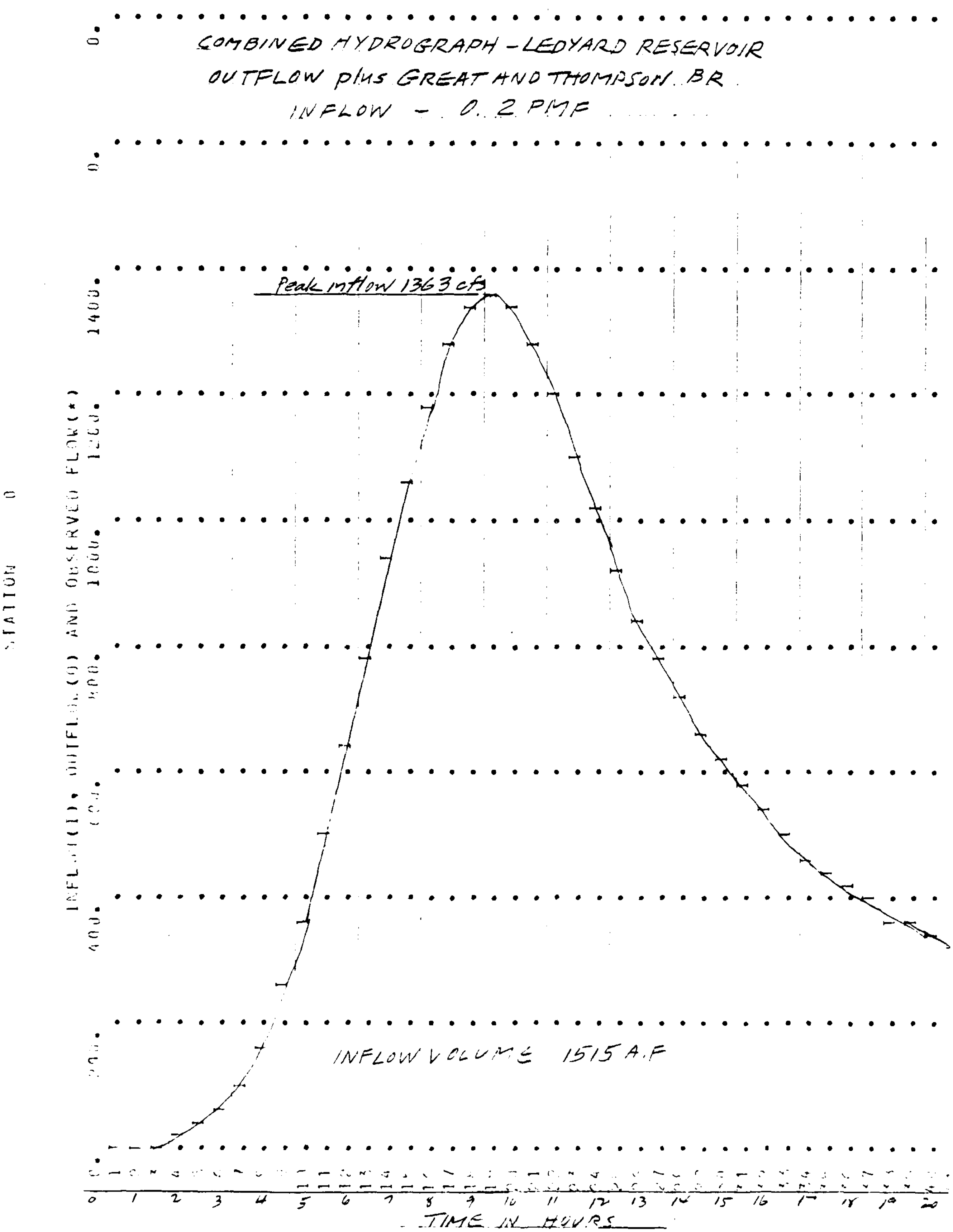
HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

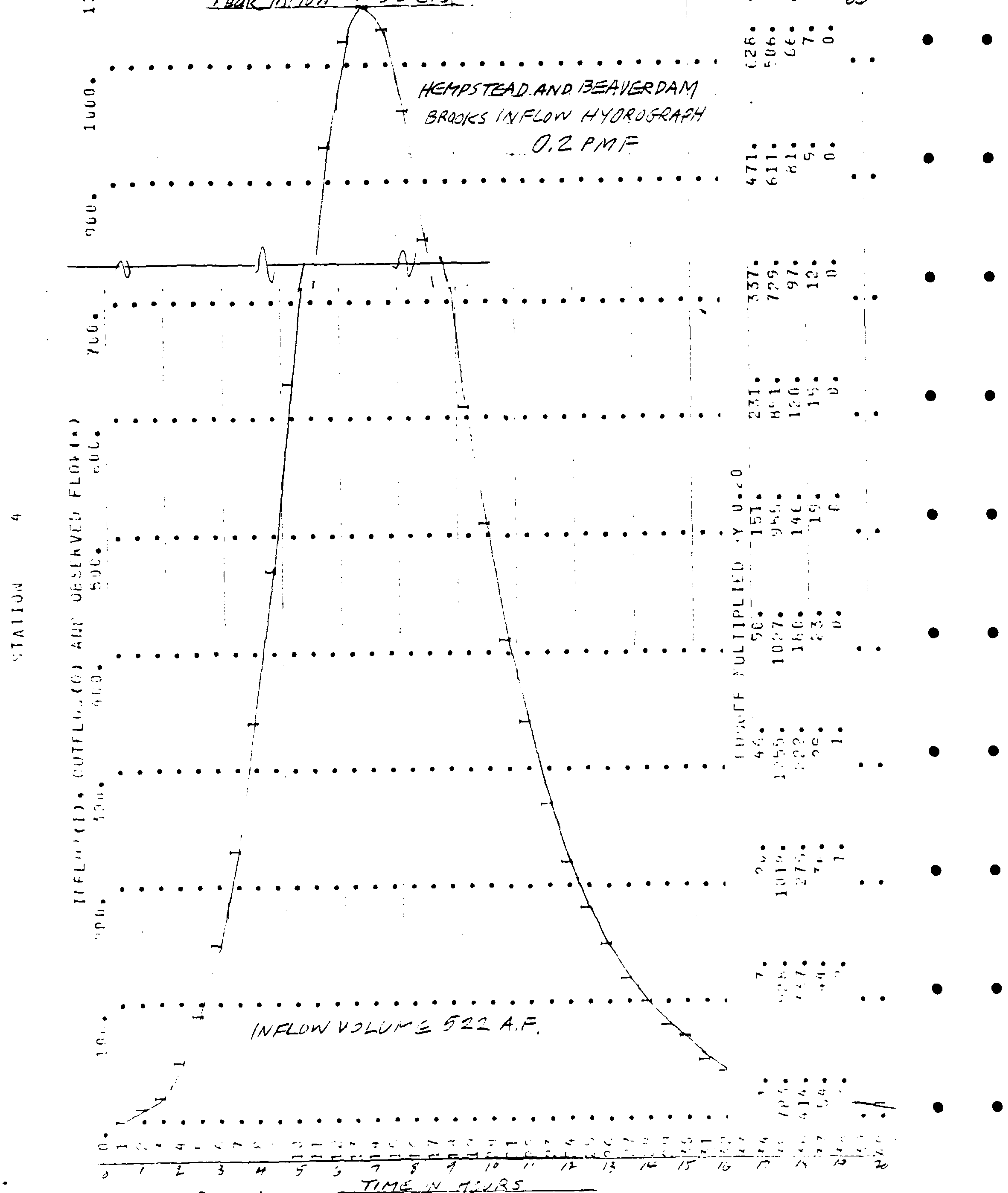
SUM OF 2 HYDROGRAPHS AT 6

0.	4.	8.	18.	47.	65.	107.	168.	255.	364.
493.	630.	788.	935.	1009.	1186.	1275.	1347.	1363.	1337.
1275.	1187.	1098.	1010.	925.	849.	779.	718.	663.	615.
571.	533.	498.	468.	440.	415.	391.	369.	353.	337.
319.	301.	290.	281.	272.	267.	261.	255.	250.	244.
239.	234.	228.	223.	218.	213.	208.	203.	198.	194.
189.	184.	180.	176.	171.	167.	163.	159.	155.	151.
147.	144.	140.	137.	133.	130.	127.	124.	121.	117.
115.	112.	109.	106.	103.	101.	98.	96.	93.	91.
89.	86.	84.	82.	80.	78.	76.	74.	72.	70.
69.	67.	65.	64.	62.	60.	59.	57.	56.	54.
54.	52.	50.	49.	48.	47.	45.	44.	43.	42.
41.	40.	39.	38.	37.	36.	35.	34.	33.	32.
31.	31.	30.	29.	29.	28.	27.	26.	26.	25.
24.	24.	23.	23.	22.	22.	21.	20.	20.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1363.	1166.	497.	254.	35633.
INCHES		1.28	2.62	3.35	3.35
AC-FT		579.	1184.	1512.	1515.


COMBINED HYDROGRAPH - LEDYARD RESERVOIR
OUTFLOW plus GREAT AND THOMPSON BR
INFLOW - 0.2 PMF
Peak inflow 1363 cfs
INFLOW VOLUME 1515 A.F
STATION 0
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0.
0.
1400.
1200.
1000.
800.
600.
400.
200.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TIME IN HOURS

Sheet D-63



D-51

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

COMBINE HYDROGRAPHS

GREAT AND THOMPSON BROOKS OUTFLOW plus HEMPSTEAD AND BEAVERDAM BR. INFLOWS
0.2 PMF

SUM HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

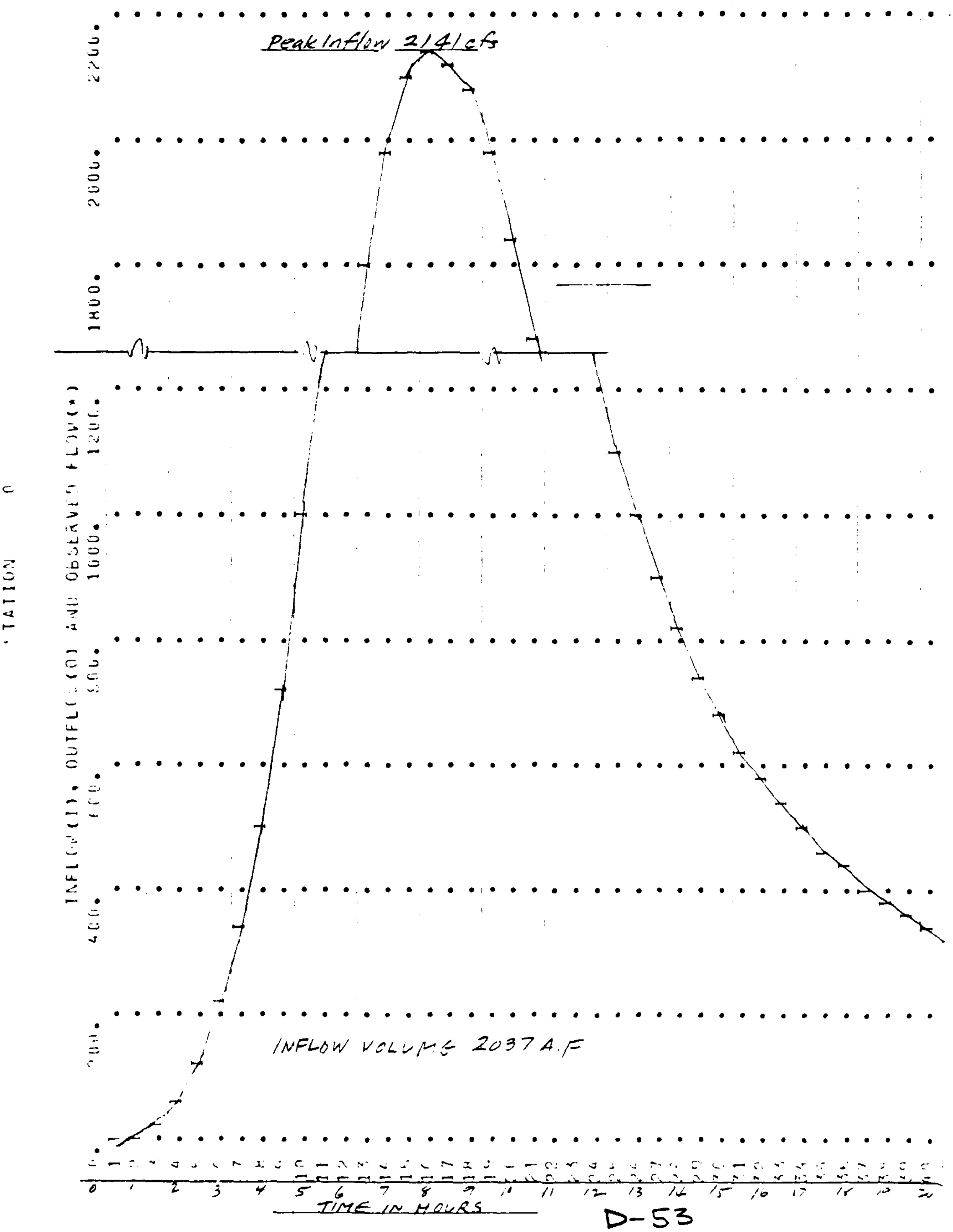
2.	5.	28.	64.	126.	216.	338.	505.	726.	992.
1976.	1566.	1806.	1990.	2056.	2141.	2126.	2076.	1974.	1843.
1489.	1429.	1373.	1232.	1104.	995.	899.	816.	743.	682.
625.	577.	535.	497.	463.	434.	406.	381.	362.	344.
315.	303.	291.	281.	272.	267.	261.	255.	250.	244.
239.	234.	228.	223.	218.	213.	208.	203.	198.	194.
189.	184.	180.	176.	171.	167.	163.	159.	155.	151.
148.	144.	140.	137.	133.	130.	127.	124.	121.	117.
115.	112.	109.	106.	103.	101.	98.	96.	93.	91.
89.	86.	84.	82.	80.	78.	76.	74.	72.	70.
69.	67.	65.	64.	62.	60.	59.	57.	56.	54.
53.	52.	50.	49.	48.	47.	45.	44.	43.	42.
41.	40.	39.	38.	37.	36.	35.	34.	33.	32.
32.	31.	30.	29.	29.	28.	27.	26.	26.	25.
24.	24.	23.	23.	22.	22.	21.	20.	20.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2141.	1851.	850.	342.	49271.
INCHES		1.52	2.80	3.37	3.38
AC-FT		915.	1687.	2033.	2037.

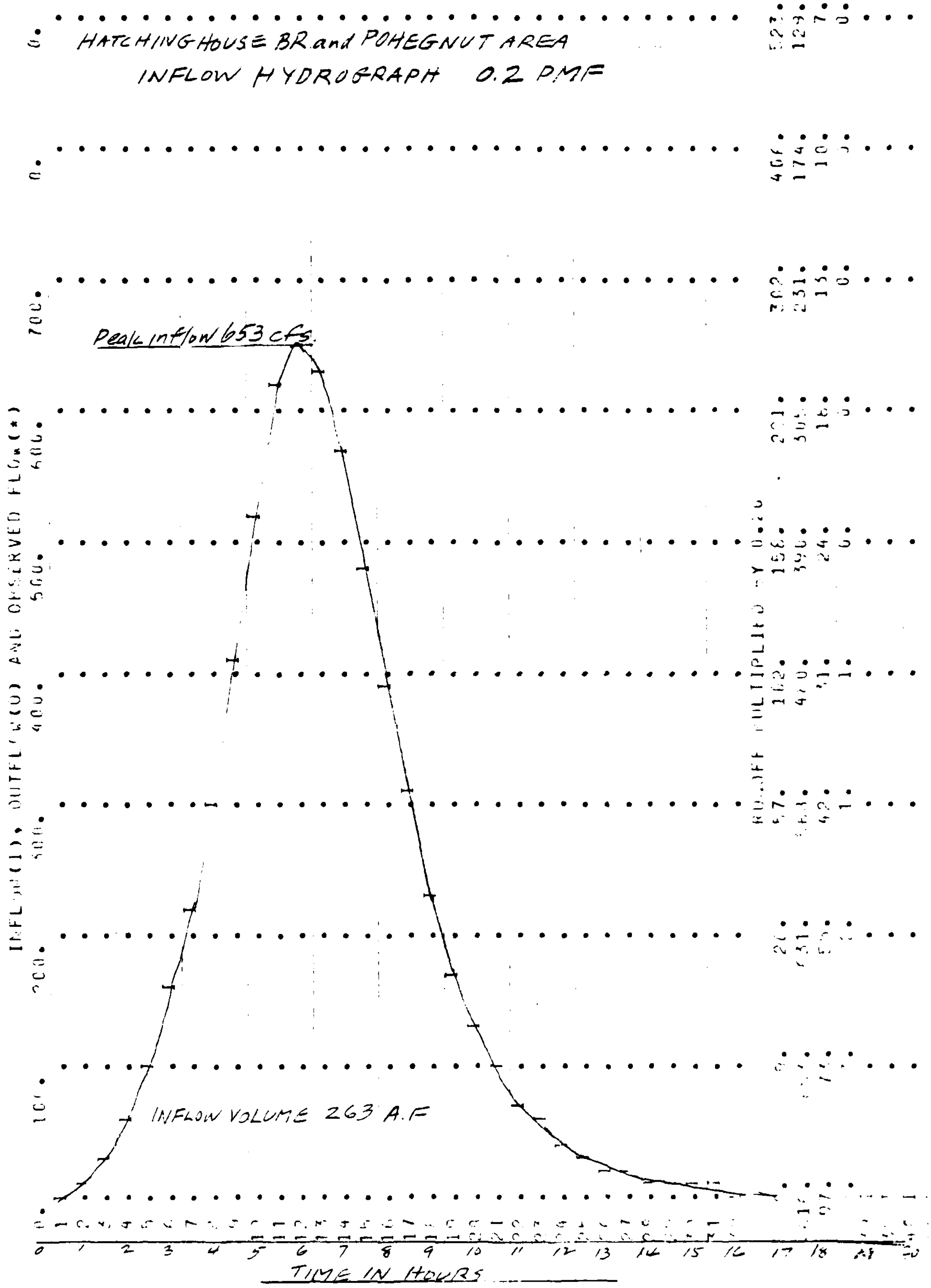
Sheet 0-64

Sheet D-65

GREAT AND THOMPSON BR. OUTFLOW plus HEMPSTEAD AND BEAVERDAM BR. INFLOWS - 0.2PMF



Sheet D-66


HATCHING HOUSE BR. and POHEGNUT AREA
INFLOW HYDROGRAPH 0.2 PMF
Peak inflow 653 cfs.
INFLOW VOLUME 263 A.F
STATION 5
TIME IN HOURS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

HYDROGRAPH ROUTING

ROUTING THROUGH RESERVOIR —POHEGNUT RESERVOIR 0.2 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
55	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	94.	196.	305.	322.	849.	909.	0.	0.	0.
OUTFLOW=	192.	543.	998.	1073.	2390.	5826.	0.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT	TIME	EOP STOR	AVG IN	EOP OUT
				27	77.	21.	157.	54	8.	0.	17.
1	0.	2.	0.	28	71.	16.	146.	55	7.	0.	15.
2	0.	5.	1.	29	66.	12.	135.	56	7.	0.	14.
3	1.	17.	2.	30	61.	8.	125.	57	6.	0.	13.
4	3.	41.	5.	31	56.	6.	115.	58	6.	0.	12.
5	5.	79.	11.	32	52.	4.	106.	59	5.	0.	11.
6	10.	130.	21.	33	48.	2.	98.	60	5.	0.	10.
7	17.	183.	34.	34	44.	1.	90.	61	5.	0.	9.
8	28.	261.	53.	35	40.	1.	83.	62	4.	0.	8.
9	38.	354.	77.	36	37.	0.	76.	63	4.	0.	8.
10	53.	465.	109.	37	34.	0.	70.	64	3.	0.	7.
11	71.	569.	146.	38	31.	0.	64.	65	3.	0.	7.
12	91.	634.	185.	39	29.	0.	59.	66	3.	0.	6.
13	108.	642.	242.	40	27.	0.	54.	67	3.	0.	6.
14	122.	599.	289.	41	24.	0.	50.	68	2.	0.	5.
15	131.	524.	320.	42	22.	0.	46.	69	2.	0.	5.
16	136.	435.	336.	43	21.	0.	42.	70	2.	0.	4.
17	136.	347.	337.	44	19.	0.	39.	71	2.	0.	4.
18	134.	258.	328.	45	17.	0.	36.	72	2.	0.	4.
19	129.	202.	311.	46	16.	0.	33.	73	2.	0.	3.
20	125.	151.	290.	47	15.	0.	30.	74	2.	0.	3.
21	116.	113.	267.	48	14.	0.	28.	75	1.	0.	3.
22	109.	85.	243.	49	12.	0.	25.	76	1.	0.	3.
23	102.	64.	219.	50	11.	0.	23.	77	1.	0.	2.
24	95.	43.	196.	51	10.	0.	21.	78	1.	0.	2.
25	89.	37.	182.	52	10.	0.	20.	79	1.	0.	2.
26	83.	28.	169.	53	9.	0.	18.	80	1.	0.	2.

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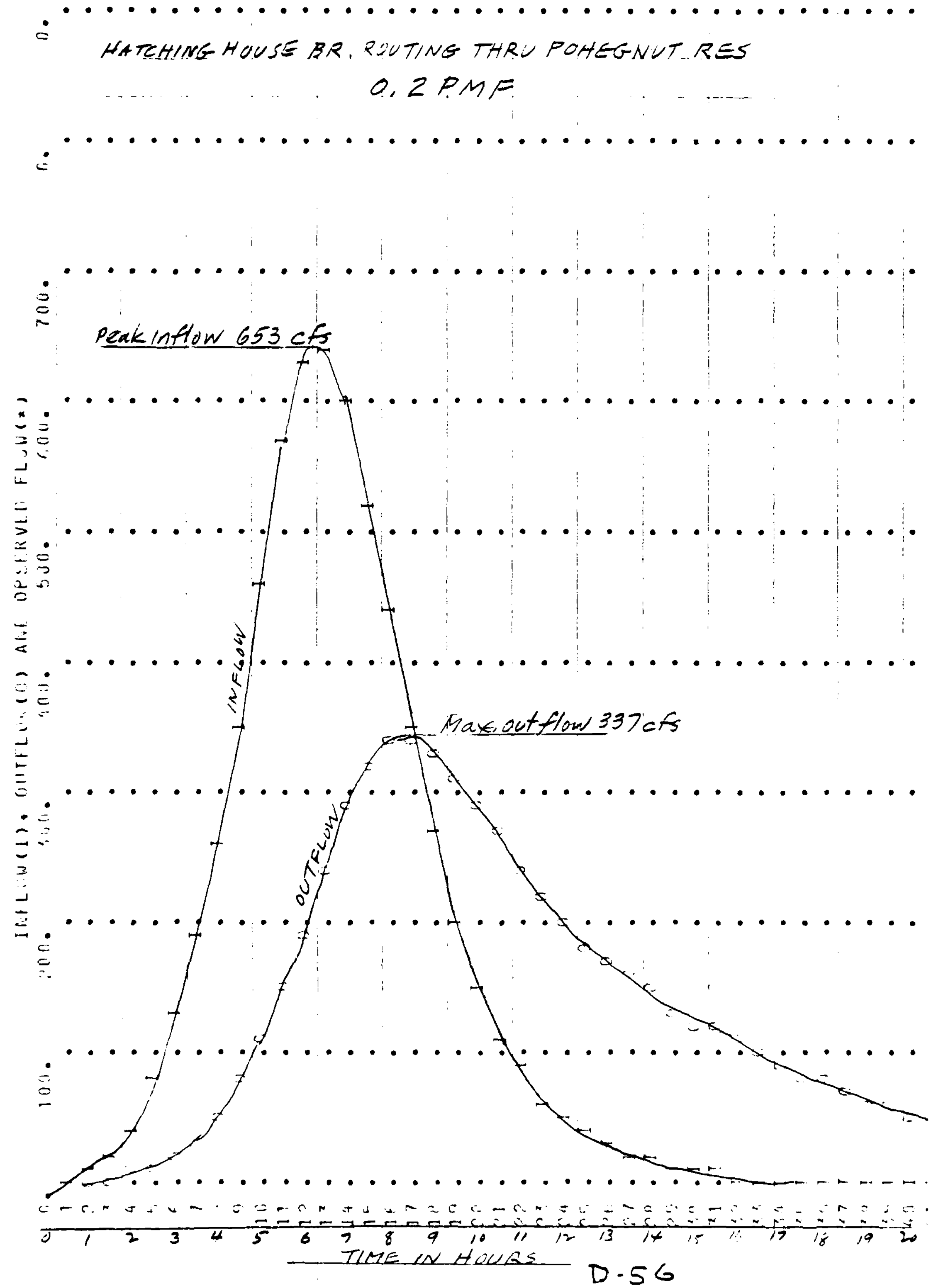
Sheet D-67


HATCHING HOUSE BR. ROUTING THRU POHEGNUT RES
0.2 PMF
Peak inflow 653 cfs
Max. outflow 337 cfs
INFLOW
OUTFLOW
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
STATION
700.
600.
500.
400.
300.
200.
100.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TIME IN HOURS

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

COMBINE HYDROGRAPHS

SUM HYDROGRAPHS - *POHEGNUT ROUTING PLUS GREAT BROOK OUTFLOW - 0.2 PMF*

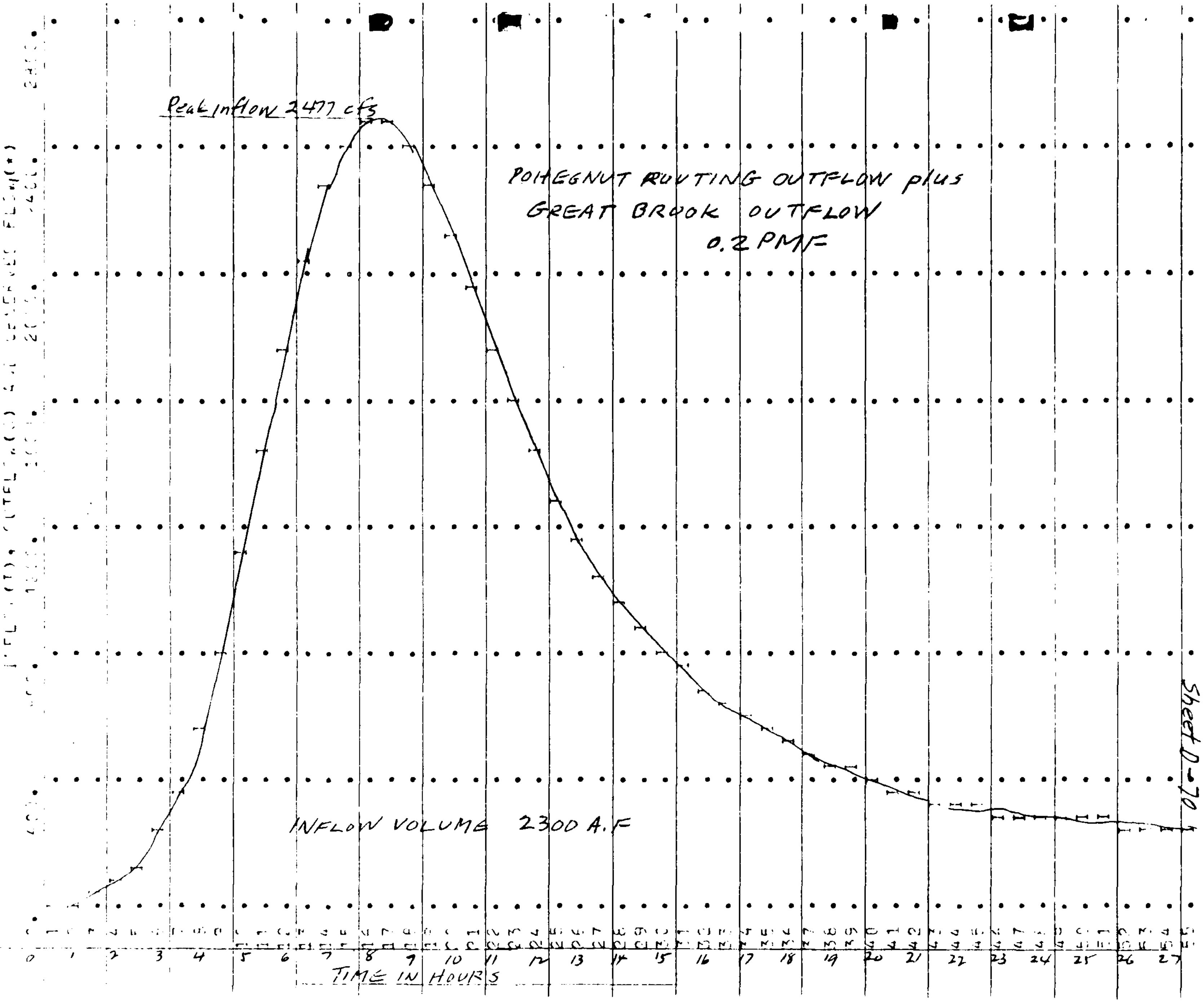
ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

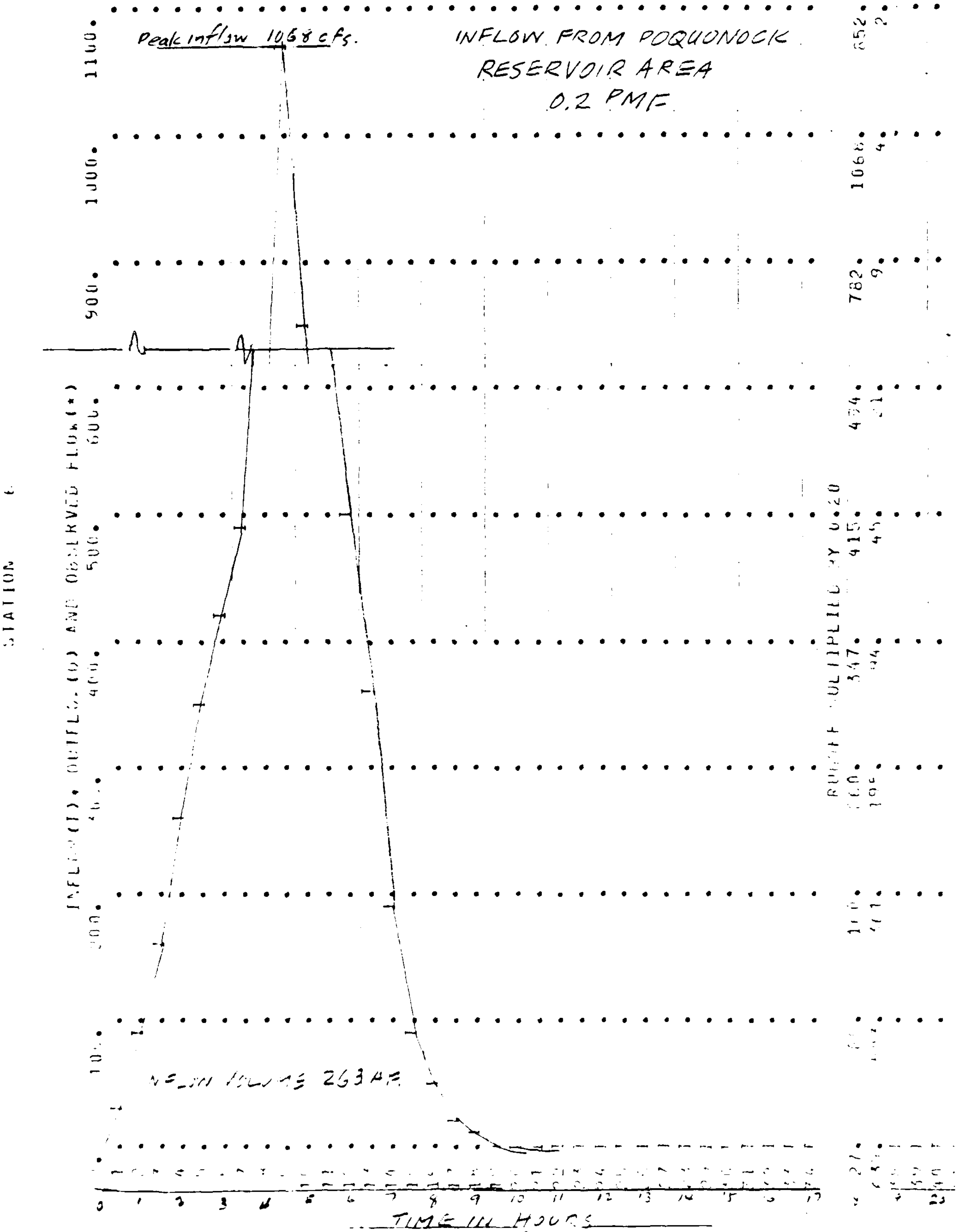
[illegible]	10.	30.	69.	138.	237.	373.	558.	804.	1100.
1422.	1751.	2047.	2279.	2416.	2477.	2463.	2404.	2286.	2133.
1956.	1772.	1592.	1423.	1286.	1164.	1056.	961.	878.	806.
740.	683.	632.	587.	546.	510.	476.	445.	421.	398.
365.	343.	333.	320.	308.	299.	291.	283.	275.	268.
267.	253.	246.	240.	233.	227.	221.	215.	209.	204.
198.	193.	188.	183.	178.	173.	169.	164.	160.	156.
151.	147.	144.	140.	136.	133.	129.	126.	123.	119.
115.	113.	110.	107.	105.	102.	99.	97.	94.	92.
89.	87.	85.	83.	81.	78.	76.	75.	73.	71.
69.	67.	65.	64.	62.	61.	59.	57.	56.	55.
53.	52.	50.	49.	48.	47.	46.	44.	43.	42.
41.	40.	39.	38.	37.	36.	35.	34.	33.	33.
32.	31.	30.	29.	29.	28.	27.	26.	26.	25.
24.	24.	23.	23.	22.	22.	21.	20.	20.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2477.	2131.	978.	386.	55637.
INCHES		1.56	2.86	3.58	3.39
AC-FT		1057.	1941.	2296.	2300.

Sheet D-69


Peak inflow 2477 cfs
POHEGNUT ROUTING OUTFLOW plus
GREAT BROOK OUTFLOW
0.2 PMF
INFLOW VOLUME 2300 A.F
TIME IN HOURS
Sheet D-70

Sheet D-71


Peak inflow 1068 cfs.
INFLOW FROM POQUONOCK
RESERVOIR AREA
0.2 PMF
STATION
TIME IN HOURS

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

COMBINE HYDROGRAPHS

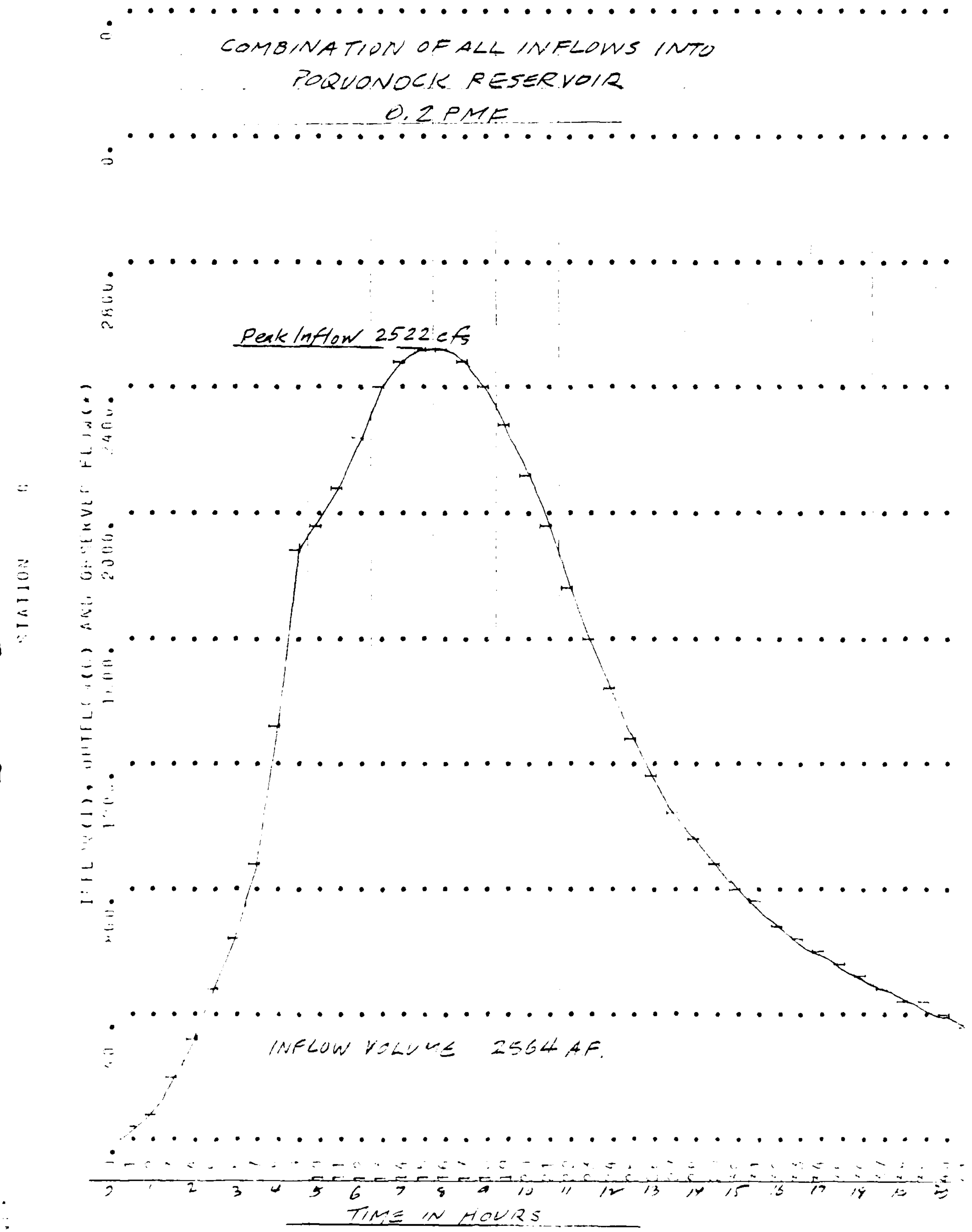
[illegible] HYDROGRAPHS - COMBINATION OF ALL INFLOWS INTO POQUONOCK RESERVOIR - 0.2 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

[illegible]	[illegible]	190.	[illegible]	[illegible]	652.	867.	1340.	1871.	1952.
2061.	[illegible]	2409.	2474.	2510.	2522.	2485.	2413.	2290.	2135.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1164.	[illegible]	961.	878.	806.
740.	[illegible]	[illegible]	[illegible]	[illegible]	510.	476.	445.	421.	398.
[illegible]	[illegible]	[illegible]	[illegible]	308.	299.	291.	283.	275.	268.
[illegible]	[illegible]	246.	[illegible]	[illegible]	227.	221.	215.	209.	204.
198.	[illegible]	188.	183.	178.	173.	169.	164.	160.	156.
151.	147.	144.	140.	136.	133.	129.	126.	123.	119.
[illegible]	[illegible]	110.	107.	[illegible]	102.	99.	97.	94.	92.
[illegible]	[illegible]	[illegible]	[illegible]	81.	78.	76.	75.	73.	71.
[illegible]	[illegible]	[illegible]	64.	[illegible]	61.	59.	57.	56.	55.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	47.	46.	44.	43.	42.
41.	[illegible]	[illegible]	[illegible]	37.	36.	35.	34.	33.	33.
[illegible]	31.	[illegible]	29.	[illegible]	28.	27.	26.	26.	25.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22.	21.	20.	20.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	[illegible]	[illegible]	1399.	439.	62005.
INCHES		[illegible]	2.69	3.39	3.39
AC-FT		[illegible]	2180.	2558.	2564.


COMBINATION OF ALL INFLOWS INTO
POQUONOCK RESERVOIR
0.2 PMF
Peak Inflow 2522 cfs
INFLOW VOLUME 2564 AF.
STATION
TIME IN HOURS

HYDROGRAPH ROUTING

FLOOD ROUTING THROUGH POQUONOCK RESERVOIR - 0.2 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
66	1	0	0	0	0	1

ROUTING DATA

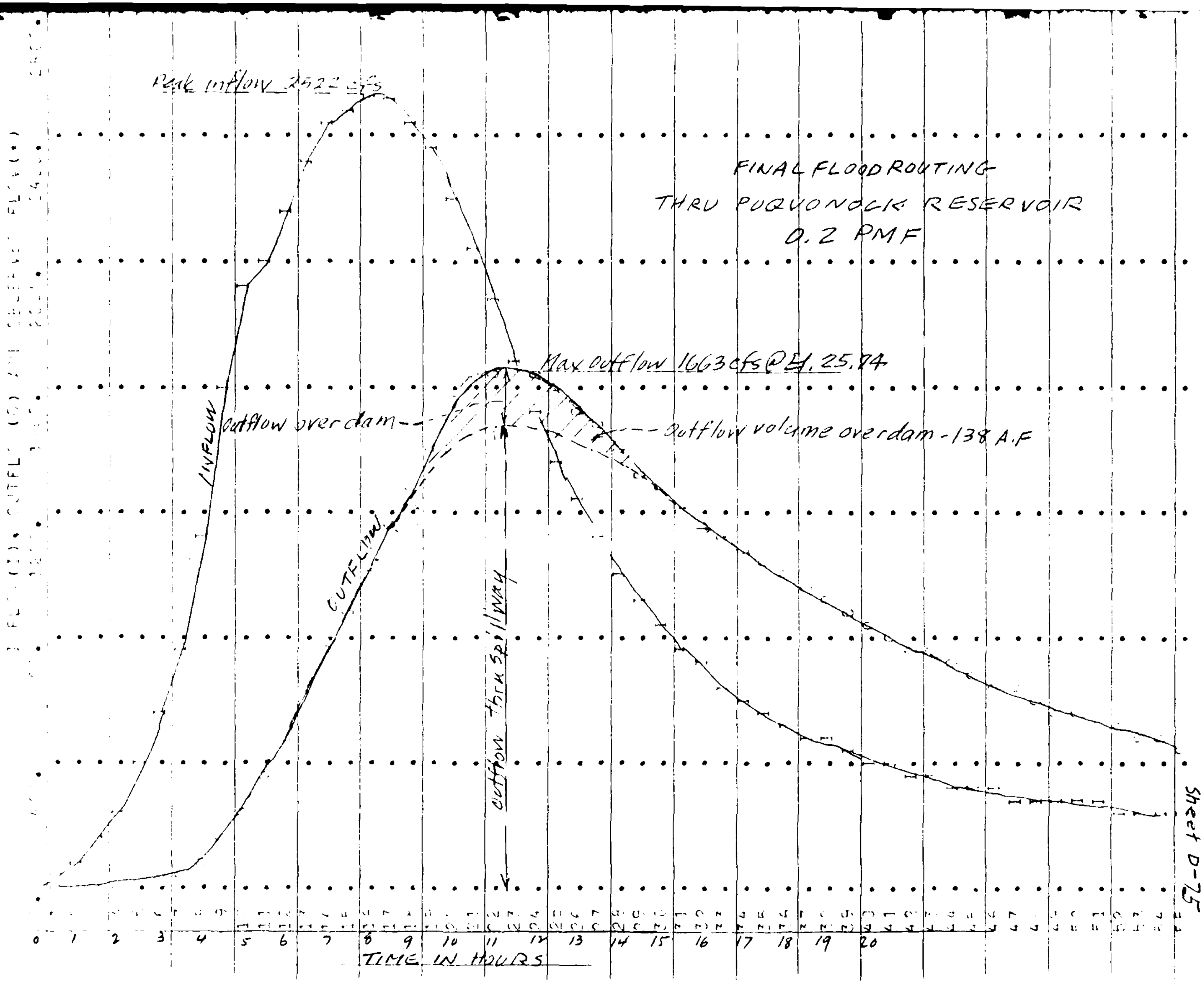
QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	94.	192.	259.	407.	682.	808.	989.	1321.	1679.
OUTFLOW=	0.	52.	146.	224.	476.	1005.	1289.	2046.	3962.	6403.

TI	EOP STOR	AVG IN	EOP OUT								
				27	851.	1110.	1468.	54	491.	243.	474.
1	1.	29.	1.	28	833.	1009.	1395.	55	391.	237.	457.
2	4.	64.	2.	29	815.	920.	1319.	56	382.	230.	441.
3	10.	144.	5.	30	797.	842.	1263.	57	374.	224.	426.
4	20.	260.	11.	31	777.	773.	1220.	58	365.	216.	411.
5	36.	407.	20.	32	757.	712.	1175.	59	357.	212.	397.
6	59.	569.	32.	33	737.	658.	1129.	60	350.	206.	384.
7	88.	753.	45.	34	716.	610.	1082.	61	342.	201.	371.
8	141.	1103.	88.	35	696.	567.	1037.	62	335.	195.	359.
9	193.	1606.	147.	36	676.	523.	993.	63	329.	190.	347.
10	264.	1912.	232.	37	656.	493.	956.	64	322.	185.	336.
11	354.	2087.	357.	38	636.	460.	919.	65	316.	180.	325.
12	456.	2158.	484.	39	617.	433.	882.	66	310.	175.	314.
13	488.	2332.	623.	40	598.	410.	847.	67	304.	171.	304.
14	552.	2441.	759.	41	580.	381.	812.	68	299.	166.	294.
15	621.	2492.	890.	42	562.	356.	777.	69	294.	162.	285.
16	688.	2516.	1013.	43	544.	341.	745.	70	289.	158.	276.
17	744.	2594.	1146.	44	528.	327.	713.	71	284.	154.	268.
18	796.	2449.	1262.	45	512.	314.	683.	72	279.	141.	259.
19	838.	2351.	1414.	46	497.	305.	655.	73	274.	146.	251.
20	868.	2212.	1541.	47	482.	295.	628.	74	270.	142.	244.
21	887.	2045.	1621.	48	469.	287.	602.	75	266.	138.	236.
22	887.	1864.	1660.	49	456.	279.	578.	76	262.	134.	229.
23	867.	1682.	1665.	50	444.	272.	555.	77	258.	131.	223.
24	852.	1510.	1639.	51	432.	264.	533.	78	254.	127.	218.
25	861.	1357.	1594.	52	421.	257.	512.	79	250.	124.	214.
26	867.	1222.	1535.	53	411.	250.	492.	80	247.	121.	209.

Sheet D-74



FINAL FLOOD ROUTING
THRU PUQUONOCK RESERVOIR
0.2 PMF
Peak inflow 2522 cfs
Max outflow 1663 cfs @ El. 25.74
outflow over dam
outflow volume over dam - 138 A.F
INFLOW
OUTFLOW
outflow thru spillway
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TIME IN HOURS
Sheet D-75

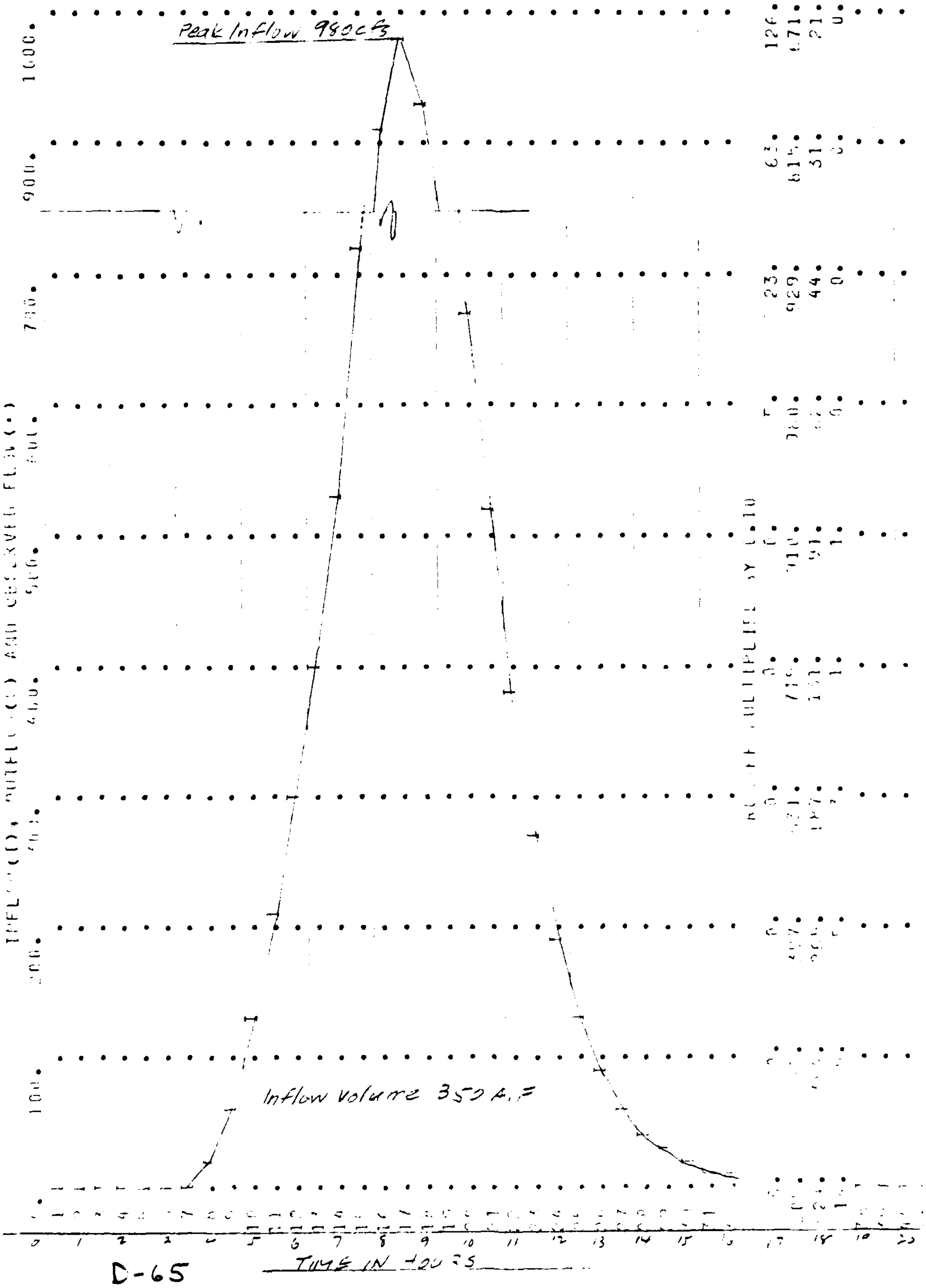
Sheet D-76

SUMMARY FOR 0.2 PMF

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	1	1960.	1239.	552.	117.	3.80
ROUTED TO	11	345.	328.	238.	114.	3.80
HYDROGRAPH AT	2	828.	468.	128.	43.	1.38
2 COMBINED	0	966.	657.	350.	156.	5.18
ROUTED TO	22	535.	480.	324.	155.	5.18
HYDROGRAPH AT	3	947.	787.	299.	100.	3.29
2 COMBINED	0	1363.	1166.	597.	254.	8.47
HYDROGRAPH AT	4	1055.	797.	265.	88.	2.83
2 COMBINED	0	2141.	1651.	856.	342.	11.30
HYDROGRAPH AT	5	655.	444.	135.	44.	1.43
ROUTED TO	55	357.	282.	128.	44.	1.43
2 COMBINED	0	2477.	2131.	978.	386.	12.73
HYDROGRAPH AT	6	1668.	506.	133.	44.	1.43
2 COMBINED	0	2522.	2288.	1099.	430.	14.16
ROUTED TO	66	1663.	1509.	945.	415.	14.16

MORGAN POND INFLOW HYDROGRAPH - 0.1 PMF



Sheet D-7B

HYDROGRAPH ROUTING

[illegible] THROUGH MORGAN [illegible] – 0.1 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
11	1	0	0	0	0	1

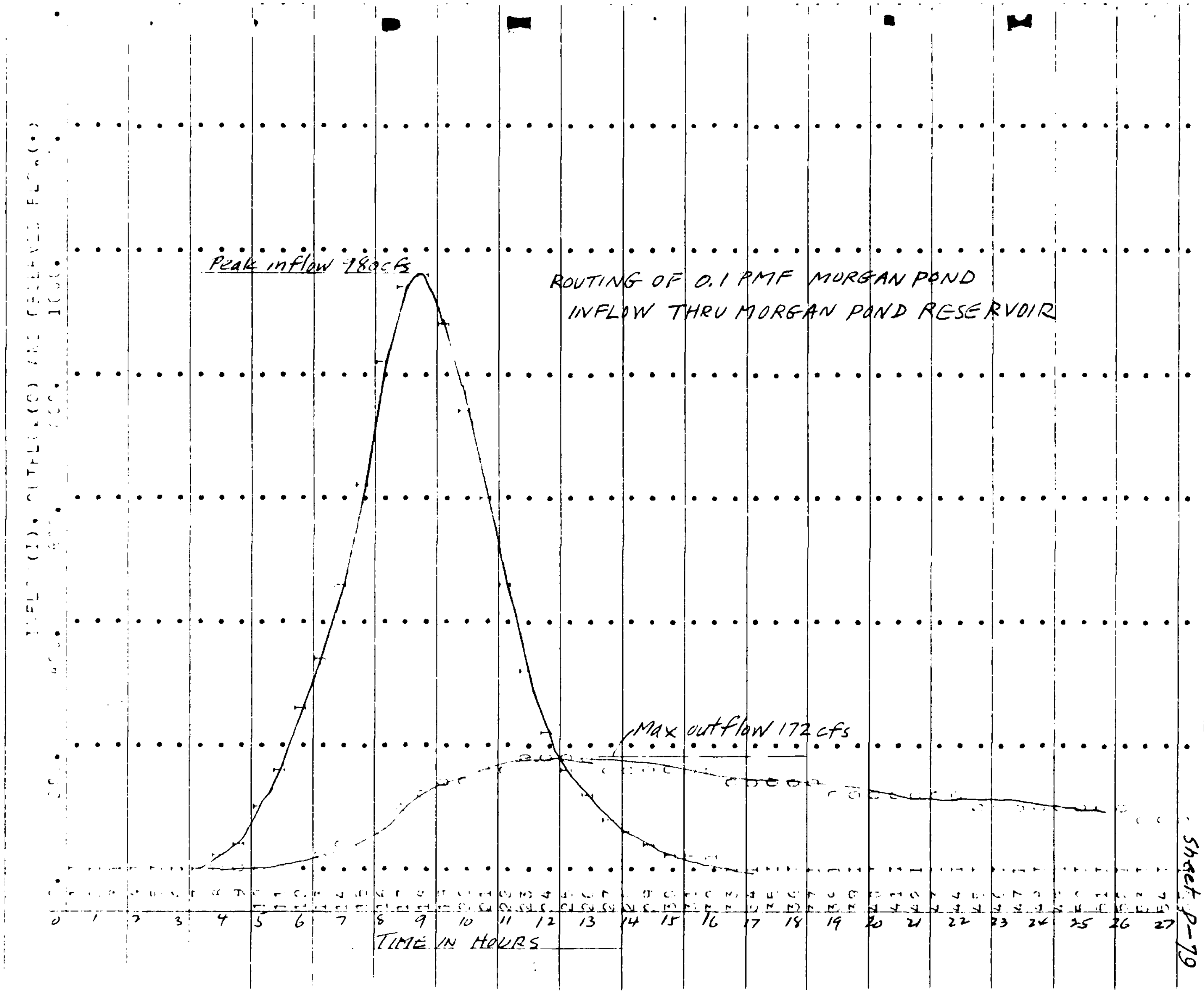
ROUTING DATA

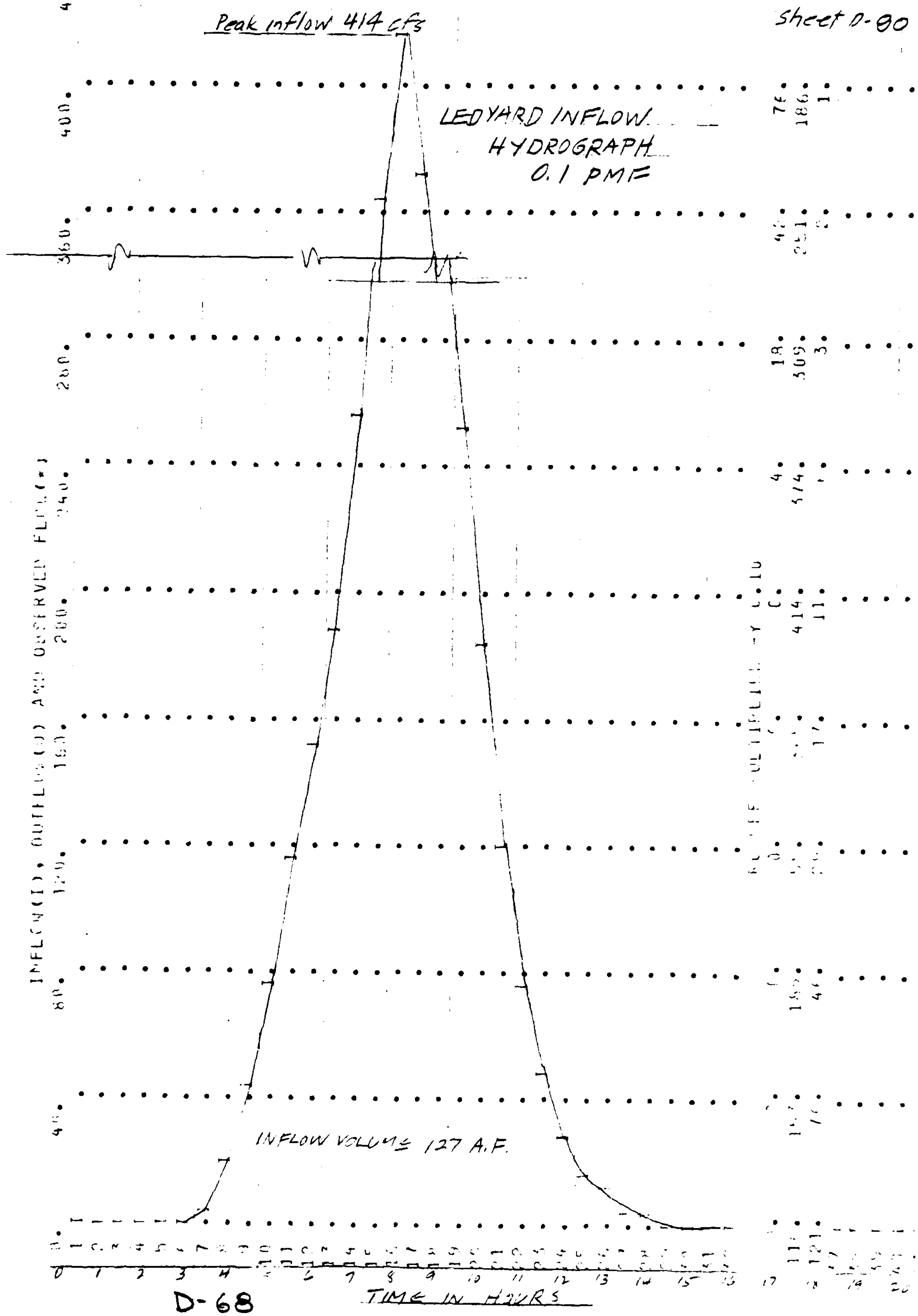
QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

644.	1000.	1573.	1761.	2572.	2994.	3426.	3536.	3975.
407.	769.	1235.	1744.	3024.	3756.	4482.	4670.	5391.

TI[illegible]	[illegible]	AVG IN	EOP OUT								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	279.	77.	168.	54	138.	[illegible]	86.
[illegible]	[illegible]	[illegible]	0.	[illegible]	254.	54.	165.	55	134.	[illegible]	84.
	[illegible]	[illegible]	0.	[illegible]	259.	37.	162.	[illegible]	131.	[illegible]	82.
	[illegible]	[illegible]	0.	[illegible]	254.	26.	158.	57	127.	[illegible]	80.
	[illegible]	[illegible]	0.	[illegible]	248.	17.	155.	58	124.	[illegible]	77.
	.	[illegible]	0.	[illegible]	242.	12.	151.	[illegible]	121.	[illegible]	76.
	.	[illegible]	0.	[illegible]	236.	7.	147.	60	118.	[illegible]	74.
	.	[illegible]	0.	[illegible]	230.	4.	144.	61	115.	[illegible]	72.
	1.	1[illegible].	0.	[illegible]	225.	2.	140.	62	112.	[illegible]	70.
	.	4[illegible].	1.	[illegible]	219.	1.	137.	[illegible]	109.	[illegible]	[illegible]
	.	[illegible]	4.	[illegible]	213.	0.	133.	[illegible]	106.	[illegible]	[illegible]
	[illegible]	1[illegible]7.	[illegible]	[illegible]	208.	0.	130.	[illegible]	104.	[illegible]	[illegible]
	[illegible]	[illegible]	14.	[illegible]	203.	0.	126.	[illegible]	101.	[illegible]	63.
	.	[illegible]	[illegible]	[illegible]	197.	0.	123.	67	98.	[illegible]	61.
	.	[illegible]	34.	61	192.	0.	120.	[illegible]	96.	[illegible]	60.
	.	[illegible]	4[illegible].	[illegible]	188.	0.	117.	[illegible]	93.	[illegible]	58.
	.	[illegible]	[illegible]	4[illegible]	1[illegible]7.	0.	114.	70	91.	[illegible]	57.
	.	[illegible]	[illegible]1.	[illegible]	178.	0.	111.	71	89.	[illegible]	[illegible]
	.	[illegible]	11[illegible].	[illegible]	174.	0.	108.	[illegible]	87.	[illegible]	54.
	.	[illegible]	1[illegible]2.	[illegible]	1[illegible]5.	0.	10[illegible].	73	84.	[illegible]	53.
	[illegible]	[illegible]	1[illegible].	[illegible]	1[illegible]5.	0.	103.	74	82.	[illegible]	51.
	.	[illegible]	1[illegible].	[illegible]	161.	0.	100.	7[illegible]	80.	[illegible]	50.
	.	[illegible]	1[illegible]7.	[illegible]	1[illegible]7.	0.	98.	7[illegible]	78.	[illegible]	49.
	.	[illegible]	171.	[illegible]	1[illegible]3.	0.	95.	77	76.	[illegible]	47.
	.	[illegible]	172.	[illegible]	14[illegible].	0.	93.	78	74.	[illegible]	[illegible]
	.	1[illegible].	172.	[illegible]	1[illegible].	0.	90.	79	72.	1.	45.
	.	111.	170.	[illegible]	141.	0.	88.	80	70.	[illegible]	44.


Peak inflow 180cfs
ROUTING OF 0.1 PMF MORGAN POND
INFLOW THRU MORGAN POND RESERVOIR
Max outflow 172 cfs
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
TIME IN HOURS
Sheet P-79


Peak inflow 414 cfs
LEDYARD INFLOW HYDROGRAPH
0.1 PMF
INFLOW VOLUME = 127 A.F.
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
STATION
TIME IN HOURS

Sheet D-81

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

COMBINE HYDROGRAPHS

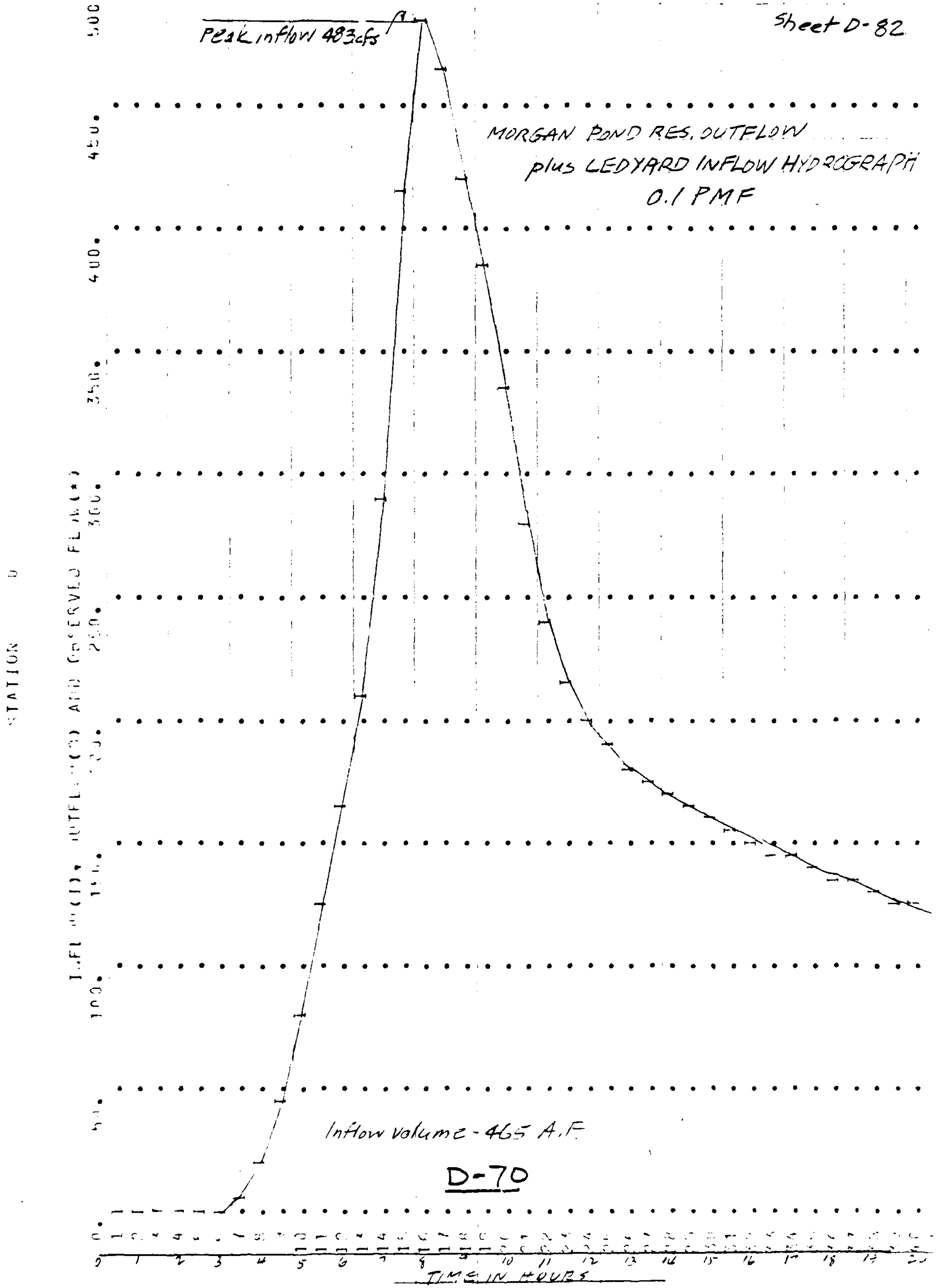
[illegible] HYDROGRAPHS – *MORGAN POND RESERVOIR OUTFLOW plus LEDYARD INFLOW HYDROGRAPH*

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT [illegible]

[illegible]	[illegible]	0.	0.	0.	0.	4.	19.	44.	80.
124.	[illegible]	211.	289.	414.	483.	465.	422.	383.	333.
[illegible]	[illegible]	217.	201.	[illegible]	181.	174.	168.	163.	159.
[illegible]	[illegible]	147.	144.	140.	137.	133.	130.	126.	123.
[illegible]	117.	114.	111.	106.	106.	103.	100.	98.	95.
[illegible]	[illegible]	88.	86.	84.	82.	80.	77.	76.	74.
[illegible]	[illegible]	[illegible]	66.	[illegible]	63.	61.	60.	58.	57.
[illegible]	[illegible]	57.	51.	50.	49.	47.	46.	45.	44.
[illegible]	[illegible]	41.	40.	[illegible]	38.	37.	36.	35.	34.
[illegible]	[illegible]	31.	31.	30.	29.	28.	28.	27.	26.
[illegible]	[illegible]	24.	24.	23.	22.	22.	21.	21.	20.
[illegible]	[illegible]	[illegible]	18.	[illegible]	17.	17.	16.	16.	16.
[illegible]	[illegible]	14.	14.	14.	13.	13.	13.	12.	12.
[illegible]	11.	11.	11.	11.	10.	10.	10.	10.	9.
[illegible]	7.	9.	8.	8.	8.	8.	8.	7.	7.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	483.	328.	175.	78.	11243.
INCHES		[illegible]	1.26	1.66	1.66
AC-FT		163.	348.	465.	465.



Peak inflow 483cfs
MORGAN POND RES. OUTFLOW
plus LEDYARD INFLOW HYDROGRAPH
0.1 PMF
STATION
Inflow volume - 465 A.F.
TIME IN HOURS

Sheet D-83

HYDROGRAPH ROUTING

ROUTING THROUGH LEGYARE RESERVOIR OF 0.1 PMF INFLOW.

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
22	1	0	0	0	0	1

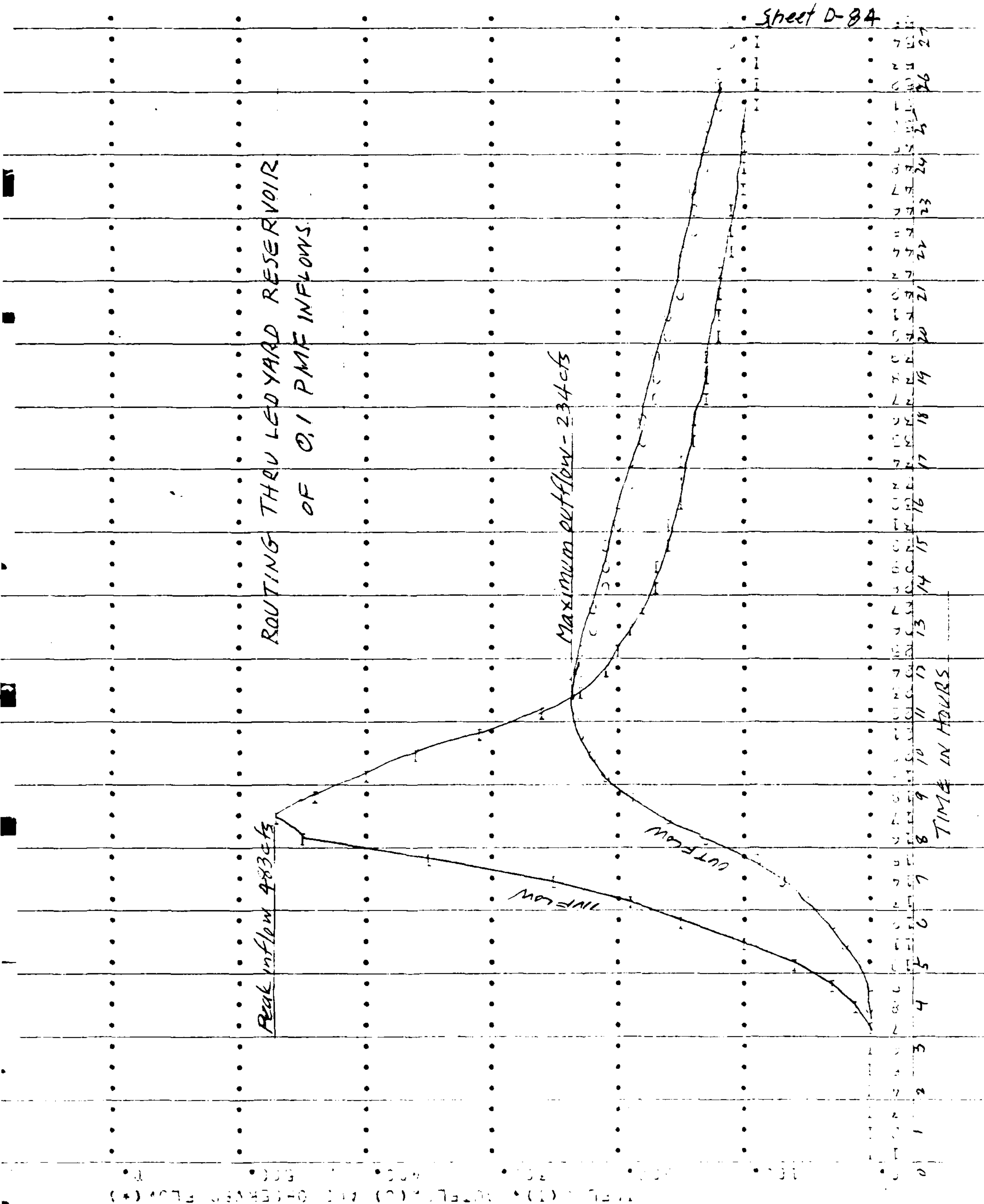
ROUTING DATA

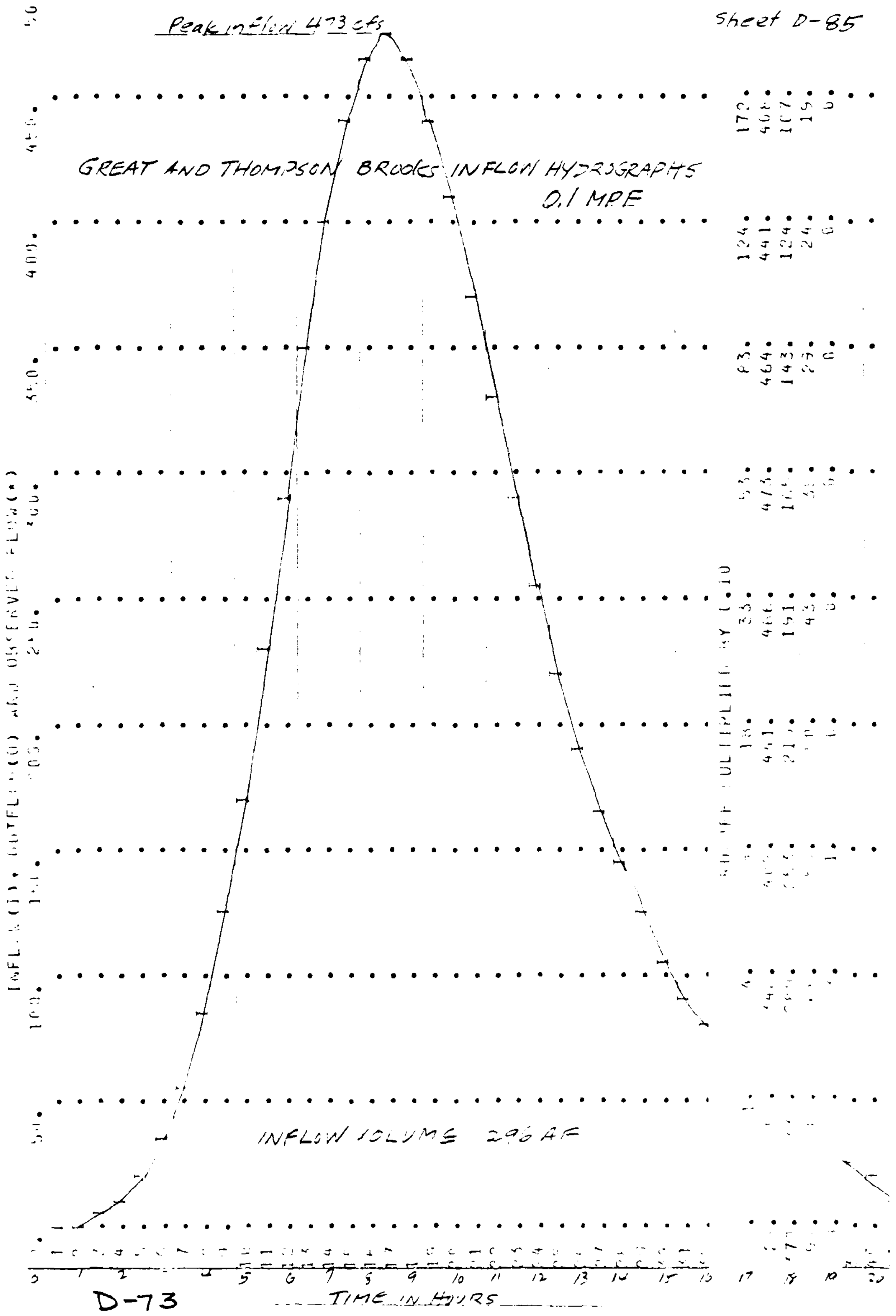
QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	137.	260.	399.	544.	695.	733.	850.	529.	1092.
OUTFLOW=	0.	416.	877.	1714.	2800.	3913.	4270.	5163.	8327.	17492.

TIME	EOP STOR	AVG IN	EOP OUT	27	70.	177.	219.	54	47.	87.	115.
1	0.	0.	0.	28	68.	171.	214.	55	46.	85.	112.
2	0.	0.	0.	29	86.	166.	210.	56	45.	83.	109.
3	0.	0.	0.	30	84.	161.	205.	57	44.	81.	106.
4	0.	0.	0.	31	82.	157.	201.	58	42.	78.	104.
5	0.	0.	0.	32	80.	153.	196.	59	41.	76.	101.
6	0.	0.	0.	33	78.	149.	191.	60	40.	75.	98.
7	0.	2.	0.	34	77.	146.	187.	61	39.	73.	96.
8	1.	11.	1.	35	75.	142.	183.	62	38.	71.	94.
9	2.	31.	4.	36	73.	138.	178.	63	37.	69.	91.
10	4.	62.	10.	37	71.	135.	174.	64	36.	67.	89.
11	8.	102.	19.	38	70.	131.	170.	65	35.	66.	87.
12	13.	145.	31.	39	68.	128.	166.	66	35.	64.	84.
13	19.	189.	46.	40	66.	125.	162.	67	34.	62.	82.
14	27.	250.	66.	41	65.	122.	158.	68	33.	61.	80.
15	38.	332.	93.	42	63.	117.	154.	69	32.	59.	78.
16	52.	441.	127.	43	62.	116.	151.	70	31.	58.	76.
17	66.	474.	161.	44	60.	113.	147.	71	30.	56.	74.
18	77.	443.	188.	45	59.	110.	144.	72	30.	55.	72.
19	85.	403.	206.	46	57.	107.	140.	73	29.	53.	71.
20	91.	351.	223.	47	56.	104.	137.	74	28.	52.	69.
21	95.	307.	231.	48	55.	102.	133.	75	27.	51.	67.
22	96.	261.	234.	49	53.	99.	130.	76	27.	49.	66.
23	95.	230.	233.	50	52.	96.	127.	77	26.	48.	64.
24	93.	207.	231.	51	51.	94.	124.	78	25.	47.	62.
25	88.	193.	228.	52	49.	92.	121.	79	25.	46.	60.
26	[illegible]	193.	223.	53	48.	89.	118.	80	24.	45.	59.


Sheet D-84
ROUTING THRU LEDYARD RESERVOIR
OF 0.1 PMF INFLOWS
Maximum outflow - 234 cfs
Peak inflow 483 cfs
INFLOW
OUTFLOW
TIME IN HOURS


Peak inflow 473 cfs
GREAT AND THOMPSON BROOKS INFLOW HYDROGRAPHS
0.1 MPE
INFLOW VOLUME 296 AF
TIME IN HOURS

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

COMBINE HYDROGRAPHS

LEDYARD RESERVOIR OUTFLOW plus GREAT AND THOMPSON BROOKS INFLOW 0.1 PMF

[illegible] HYDROGRAPHS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

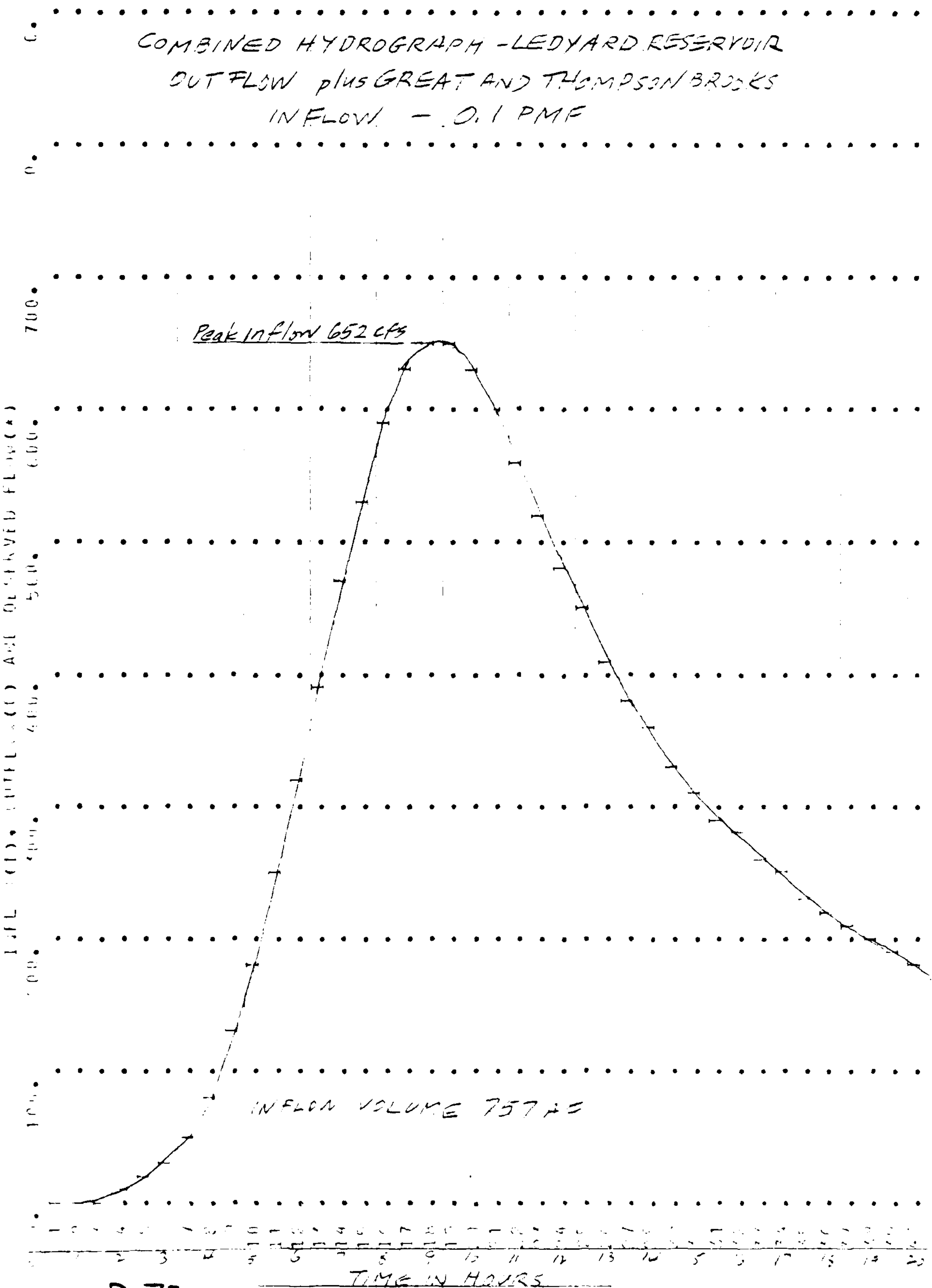
SUM OF 2 HYDROGRAPHS AT [illegible]

1.	1.	4.	9.	18.	33.	54.	84.	128.	162.
247.	[illegible]	334.	558.	554.	593.	634.	652.	645.	631.
401.	[illegible]	522.	484.	447.	414.	384.	358.	333.	313.
[illegible]	[illegible]	260.	246.	233.	221.	210.	200.	190.	181.
167.	[illegible]	154.	149.	144.	140.	137.	133.	130.	127.
124.	121.	117.	115.	112.	109.	106.	104.	101.	98.
[illegible]	[illegible]	91.	89.	87.	84.	82.	80.	78.	76.
76.	[illegible]	71.	69.	67.	65.	64.	62.	60.	59.
57.	[illegible]	[illegible]	53.	52.	51.	49.	48.	47.	46.
[illegible]	[illegible]	[illegible]	41.	40.	39.	38.	37.	36.	35.
[illegible]	[illegible]	[illegible]	32.	31.	30.	29.	29.	28.	27.
[illegible]	[illegible]	[illegible]	25.	24.	23.	23.	22.	22.	21.
[illegible]	[illegible]	[illegible]	19.	18.	18.	18.	17.	17.	16.
[illegible]	[illegible]	[illegible]	[illegible]	14.	14.	14.	13.	13.	13.
[illegible]	[illegible]	[illegible]	11.	11.	11.	10.	10.	10.	10.

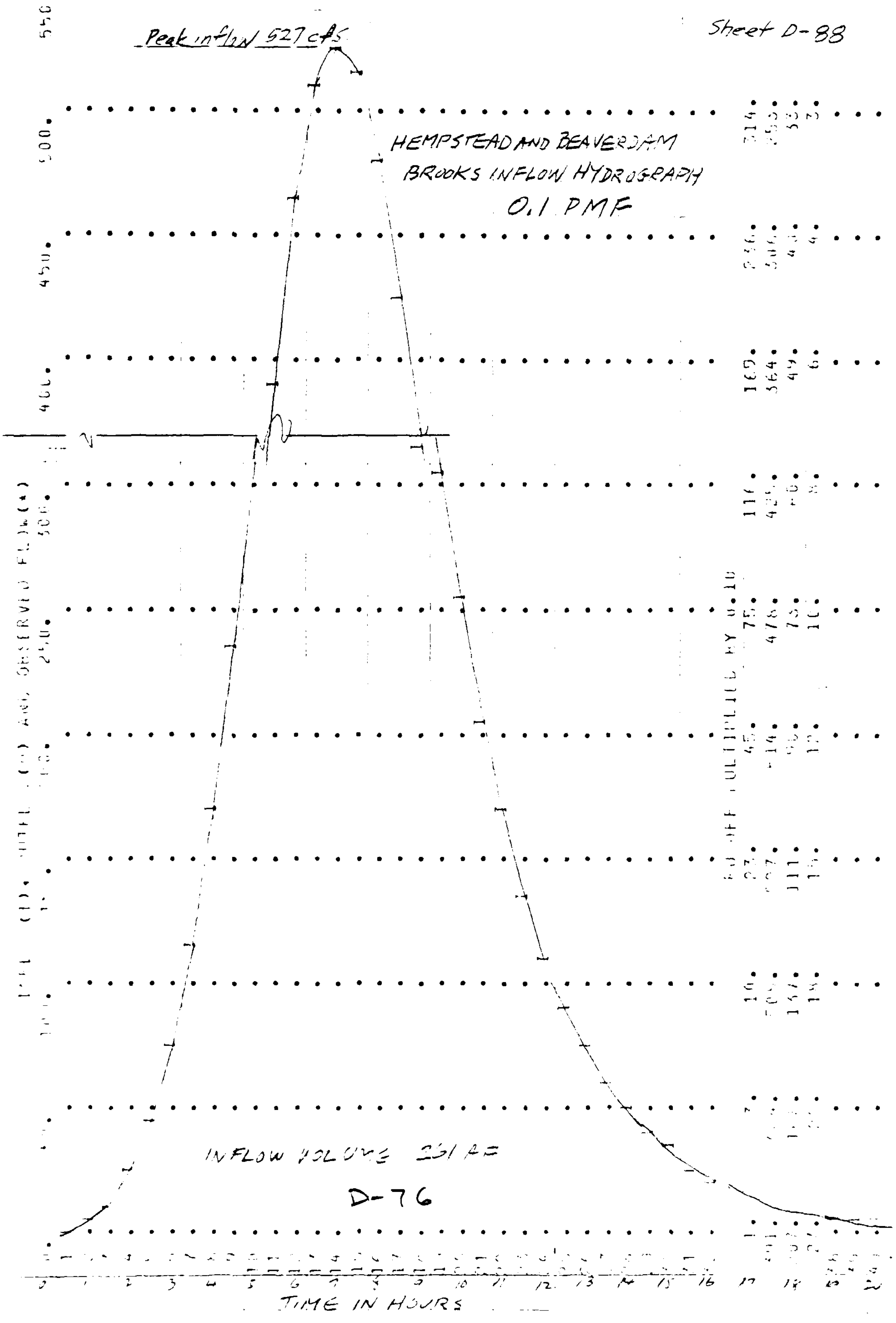
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	652.	[illegible]	296.	[illegible]	18316.
INCHES		[illegible]	1.51	1.67	1.68
AC-FT		[illegible]	591.	[illegible]	757.

Sheet D-86

Sheet D-87



D-75


Peak inflow 527 cfs
HEMPSTEAD AND BEAVERDAM
BROOKS INFLOW HYDROGRAPH
0.1 PMF
INFLOW VOLUME 231 AF
D-76
TIME IN HOURS

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

COMBINE HYDROGRAPHS

GREAT AND THOMPSON BROOKS OUTFLOW plus HEMPSTEAD AND BEAVERDAM BROOKS INFLOW - 0.1 PMF

SUM HYDROGRAPHS

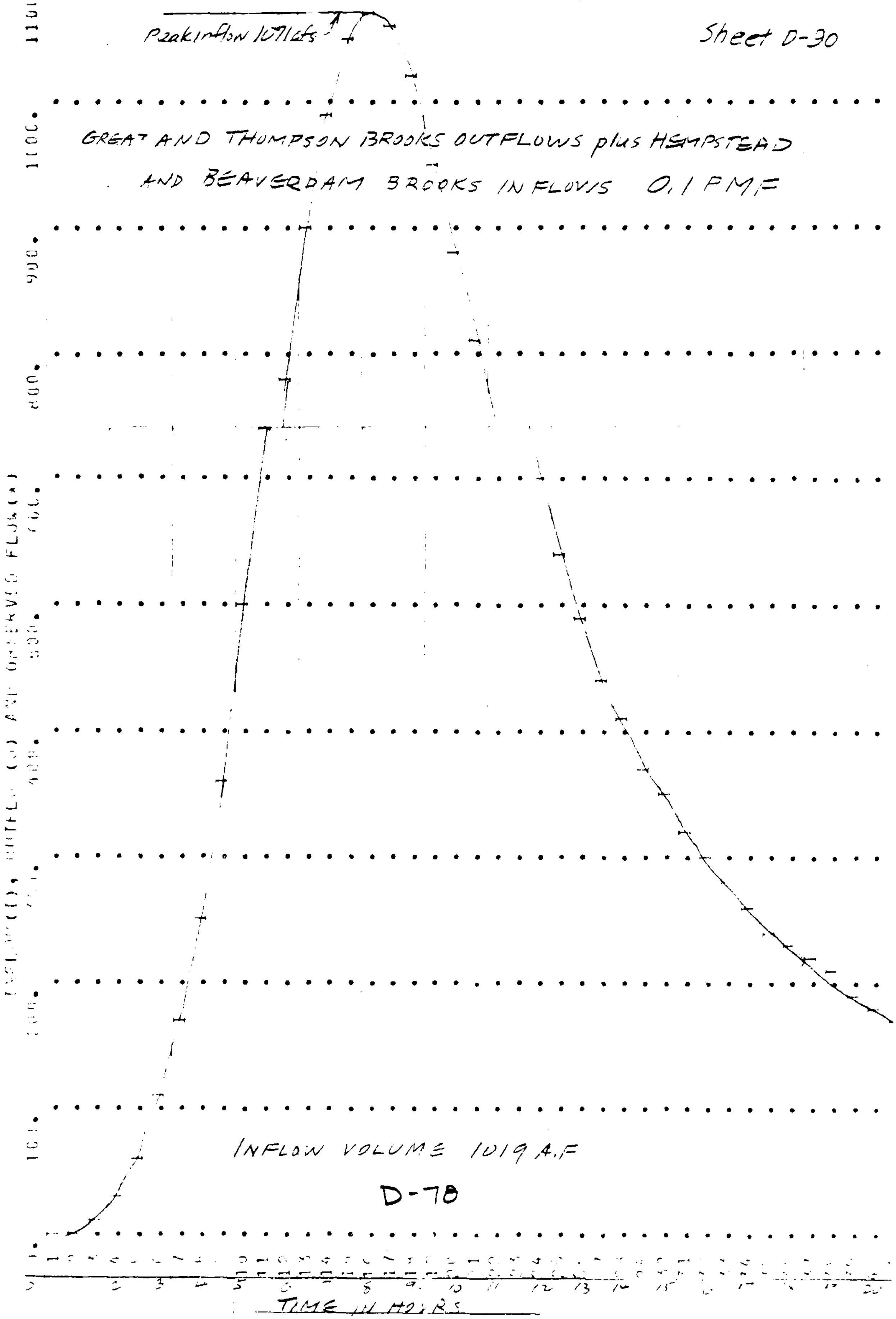
ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

1.	[illegible]	14.	32.	[illegible]	108.	169.	253.	363.	496.
639.	787.	963.	995.	1048.	1071.	1099.	1016.	955.	884.
807.	759.	659.	595.	537.	488.	444.	406.	374.	346.
329.	298.	278.	261.	245.	231.	217.	206.	195.	184.
169.	161.	155.	149.	144.	140.	137.	133.	130.	127.
124.	121.	118.	115.	112.	109.	106.	104.	101.	98.
97.	94.	91.	89.	87.	84.	82.	80.	78.	76.
74.	72.	71.	69.	67.	65.	64.	62.	60.	59.
57.	[illegible]	[illegible]	53.	[illegible]	51.	49.	46.	47.	46.
44.	43.	42.	41.	40.	39.	37.	37.	36.	35.
34.	[illegible]	33.	32.	31.	30.	29.	29.	28.	27.
27.	26.	25.	25.	24.	23.	23.	22.	22.	21.
20.	[illegible]	19.	19.	18.	18.	18.	17.	17.	16.
16.	15.	15.	15.	14.	14.	14.	13.	13.	13.
[illegible]	[illegible]	12.	11.	11.	11.	10.	10.	10.	10.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1071.	509.	424.	171.	24635.
INCHES		[illegible]	1.40	1.69	1.69
AC-FT		451.	842.	1017.	1019.

Sheet D-30



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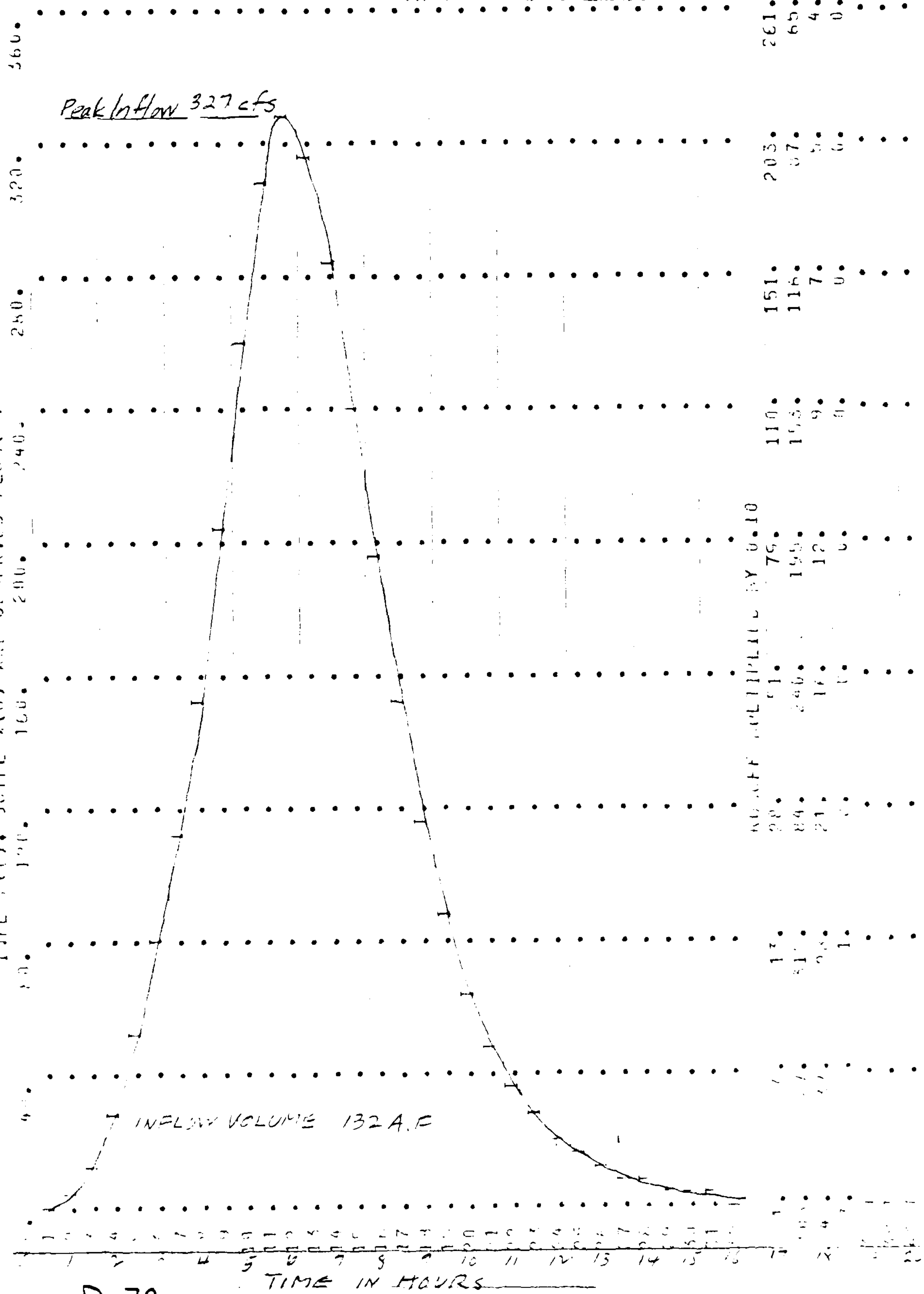
Sheet D-91

HATCHING HOUSE BROOK and POHEGNUT AREA
INFLOW HYDROGRAPH - 0.1 PMF



D-79

HYDROGRAPH ROUTING

ROUTE THROUGH RESERVOIR - POHEGNUT RESERVOIR 0.1 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
55	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	94.	196.	305.	522.	849.	969.	0.	0.	0.
OUTFLOW=	0.	192.	543.	998.	1073.	2390.	5826.	0.	0.	0.

TIME	EOP STOR	AVG IN	EOP OUT								
				27	43.	11.	87.	54	4.	[illegible]	9.
1	0.	1.	0.	28	39.	8.	81.	55	4.	0.	8.
2	0.	5.	0.	29	37.	6.	75.	56	4.	0.	8.
3	0.	9.	1.	30	34.	4.	69.	57	3.	0.	7.
4	1.	21.	3.	31	31.	3.	64.	58	3.	0.	7.
5	3.	40.	6.	32	29.	2.	59.	59	3.	[illegible]	6.
6	5.	65.	10.	33	26.	1.	54.	60	3.	[illegible]	6.
7	8.	95.	17.	34	24.	1.	50.	61	2.	[illegible]	5.
8	13.	131.	26.	35	22.	0.	46.	62	2.	[illegible]	5.
9	19.	177.	39.	36	21.	0.	42.	63	2.	[illegible]	4.
10	27.	232.	54.	37	19.	0.	39.	64	2.	[illegible]	4.
11	36.	285.	73.	38	17.	0.	35.	65	2.	[illegible]	4.
12	45.	317.	93.	39	16.	0.	33.	66	2.	[illegible]	[illegible]
13	54.	321.	111.	40	15.	0.	30.	67	1.	[illegible]	3.
14	62.	300.	126.	41	13.	0.	28.	68	1.	[illegible]	[illegible]
15	67.	262.	137.	42	12.	0.	25.	69	1.	[illegible]	[illegible]
16	70.	213.	144.	43	11.	0.	23.	70	1.	[illegible]	[illegible]
17	72.	174.	146.	44	10.	0.	21.	71	1.	[illegible]	[illegible]
18	71.	134.	145.	45	10.	0.	20.	72	1.	[illegible]	[illegible]
19	69.	101.	142.	46	9.	0.	18.	73	1.	[illegible]	[illegible]
20	67.	76.	136.	47	8.	0.	17.	74	1.	[illegible]	[illegible]
21	64.	57.	130.	48	7.	0.	15.	75	1.	[illegible]	[illegible]
22	60.	43.	123.	49	7.	0.	14.	76	1.	[illegible]	1.
23	57.	32.	116.	50	6.	0.	13.	77	1.	[illegible]	1.
24	53.	24.	108.	51	5.	0.	12.	78	1.	[illegible]	1.
25	49.	18.	101.	52	5.	0.	11.	79	1.	0.	1.
26	46.	14.	94.	53	5.	0.	10.	80	0.	[illegible]	1.

D-80

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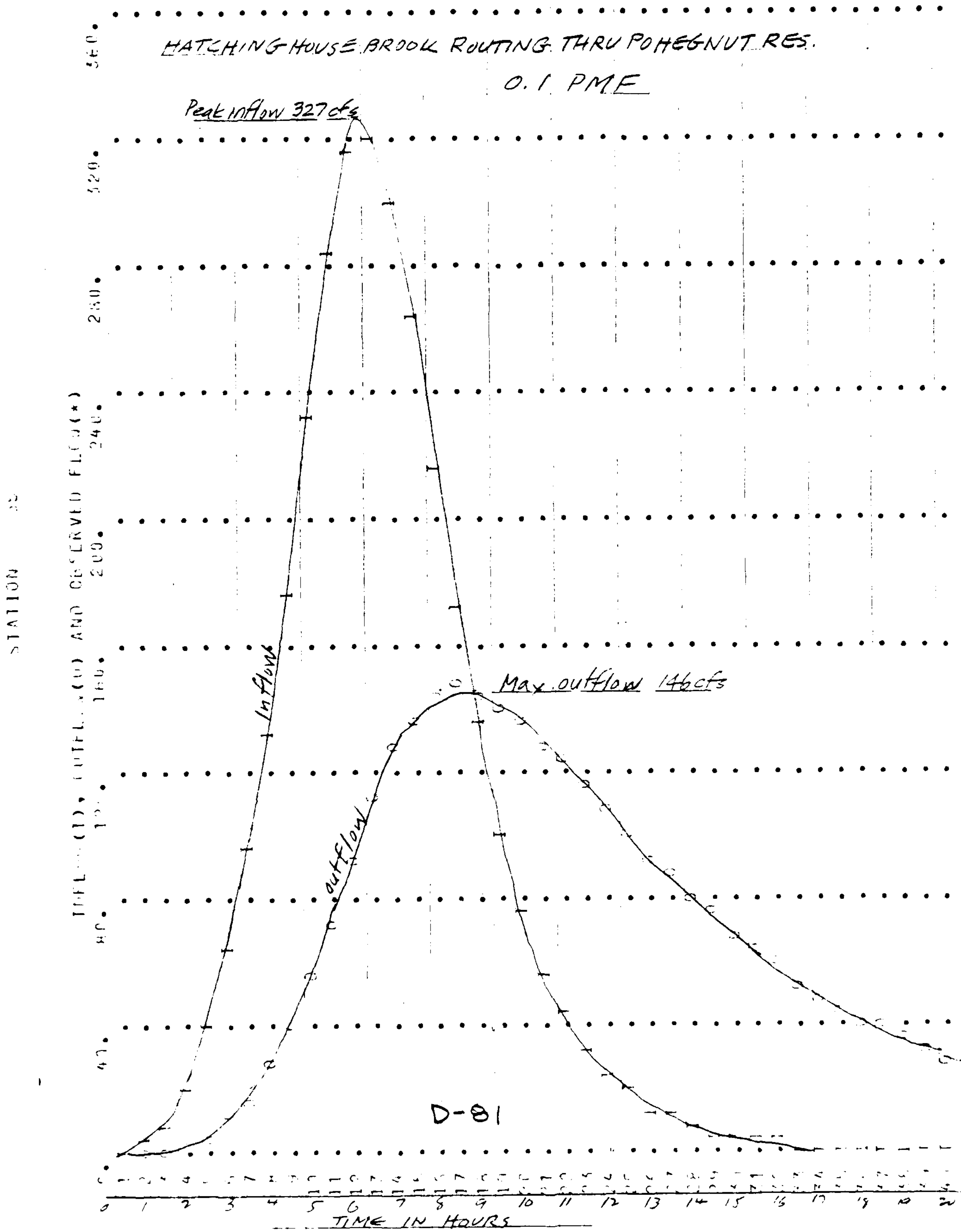

HATCHING HOUSE BROOK ROUTING THRU POHEGNUT RES.
0.1 PME
Peak inflow 327cfs
Max outflow 146cfs
Inflow
outflow
TIME IN HOURS
STATION
INFLOW (I), OUTFLOW (O) AND OBSERVED FLOW (*)

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

COMBINE HYDROGRAPHS

[illegible] HYDROGRAPHS - POHEGNUT ROUTING OUTFLOW plus GREAT BROOK INFLOW - 0.1 PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

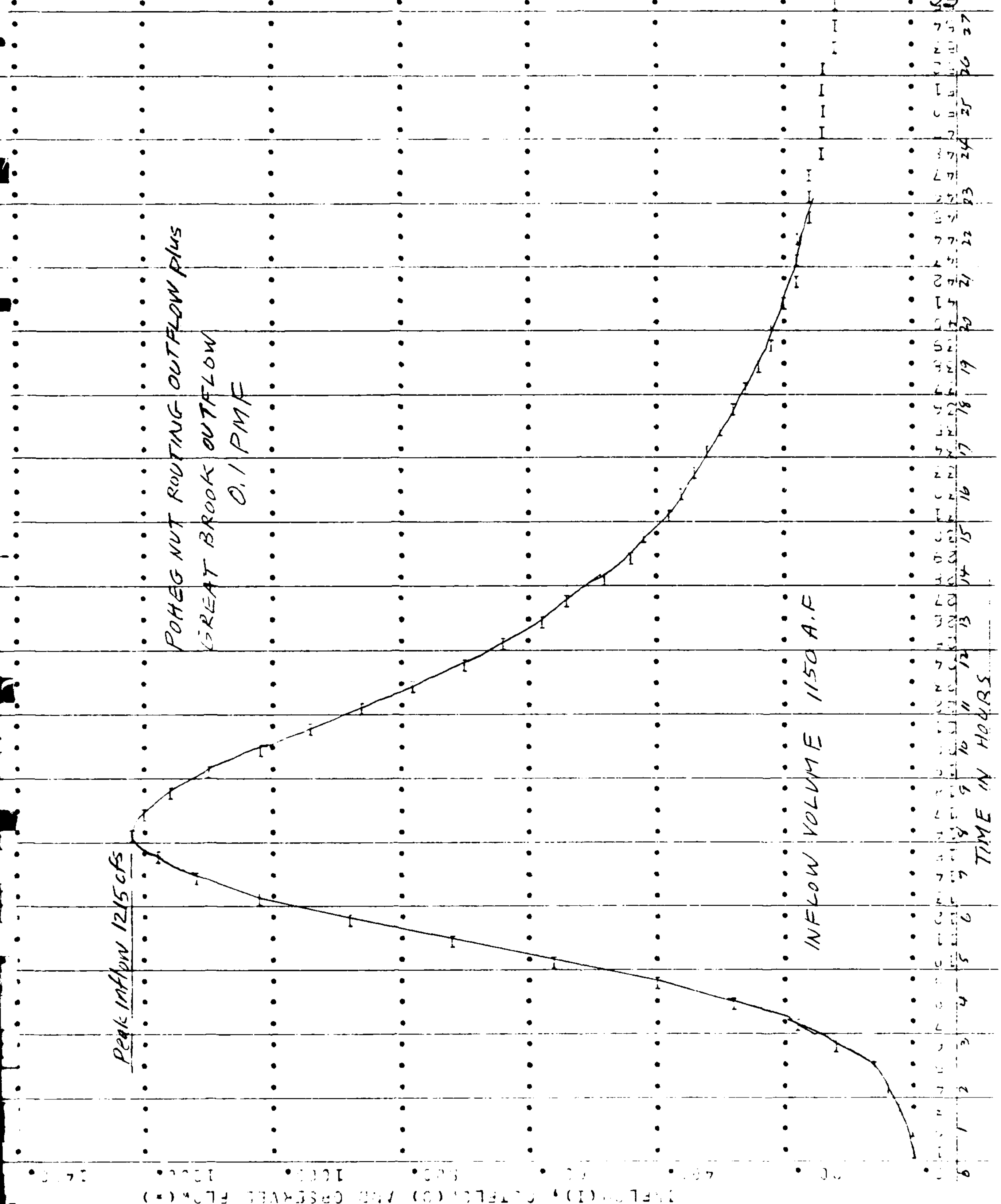
SUM OF 2 HYDROGRAPHS AT [illegible]

[illegible]	[illegible]	15.	35.	69.	118.	186.	279.	402.	550.
711.	876.	1014.	1121.	1185.	1215.	1206.	1161.	1096.	1021.
[illegible]	[illegible]	77[illegible].	703.	638.	581.	531.	487.	448.	415.
[illegible]	[illegible]	332.	310.	290.	273.	256.	241.	227.	214.
[illegible]	167.	17[illegible].	170.	163.	158.	153.	148.	144.	140.
[illegible]	131.	128.	124.	120.	117.	113.	110.	107.	104.
101.	[illegible]	95.	93.	90.	88.	85.	83.	81.	79.
[illegible]	74.	72.	70.	69.	67.	65.	63.	62.	60.
[illegible]	57.	55.	54.	53.	51.	50.	49.	47.	46.
[illegible]	44.	43.	41.	40.	39.	38.	37.	36.	35.
[illegible]	34.	33.	32.	31.	30.	30.	29.	28.	27.
27.	[illegible]	[illegible]	25.	24.	23.	23.	22.	22.	21.
21.	[illegible]	[illegible]	19.	19.	18.	18.	17.	17.	16.
[illegible]	[illegible]	15.	15.	14.	14.	14.	13.	13.	13.
[illegible]	12.	12.	11.	11.	11.	10.	10.	10.	10.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1215.	1059.	488.	193.	27818.
INCHES		0.74	1.43	1.69	1.69
AC-FT		519.	969.	1148.	1150.

Sheet D-94

Sheet D-95



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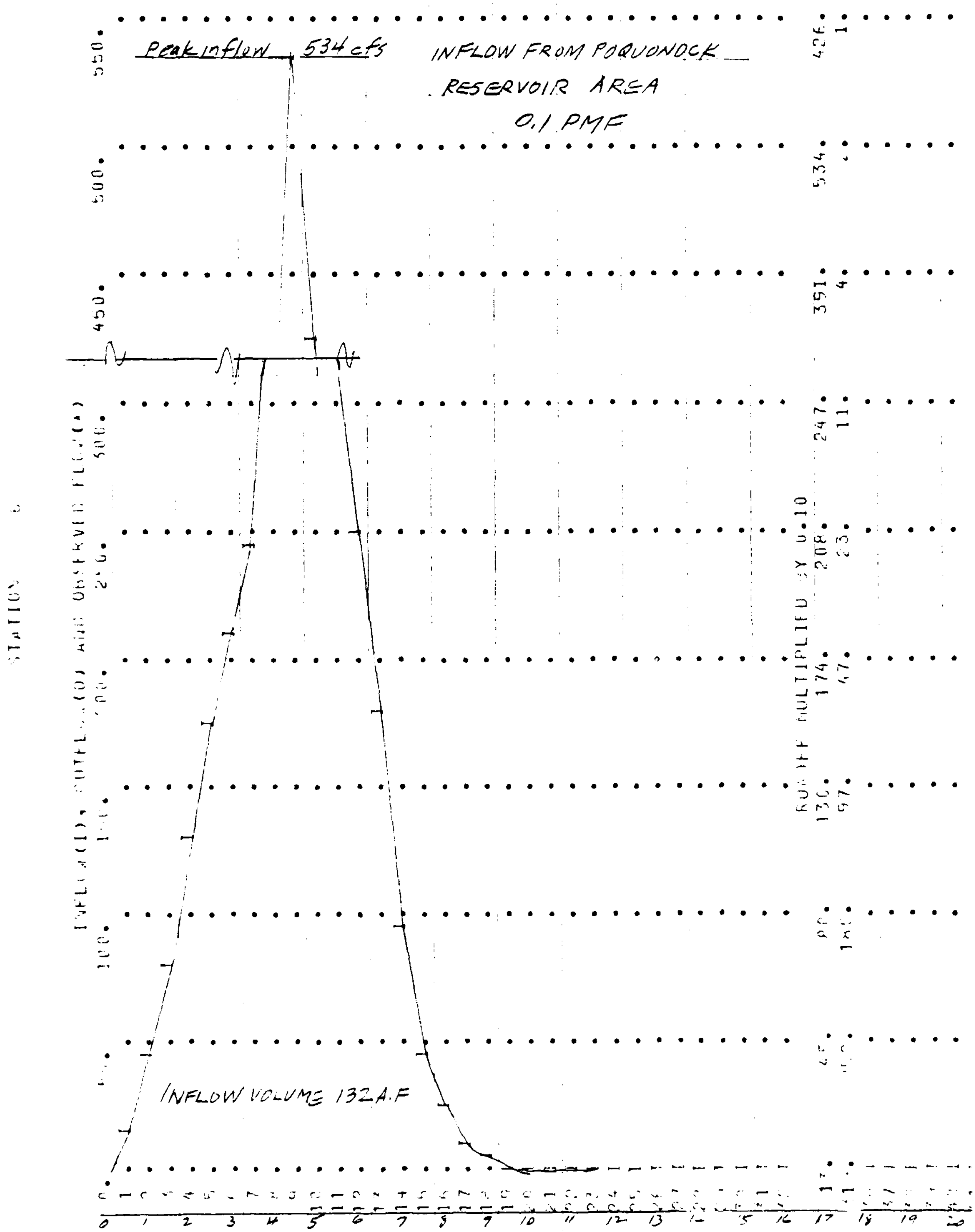


TIME IN HOURS

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

COMBINE HYDROGRAPHS

SUM HYDROGRAPHS COMBINATION OF ALL INFLOWS INTO POQUONOCK RESERVOIR - 0.1 PMF

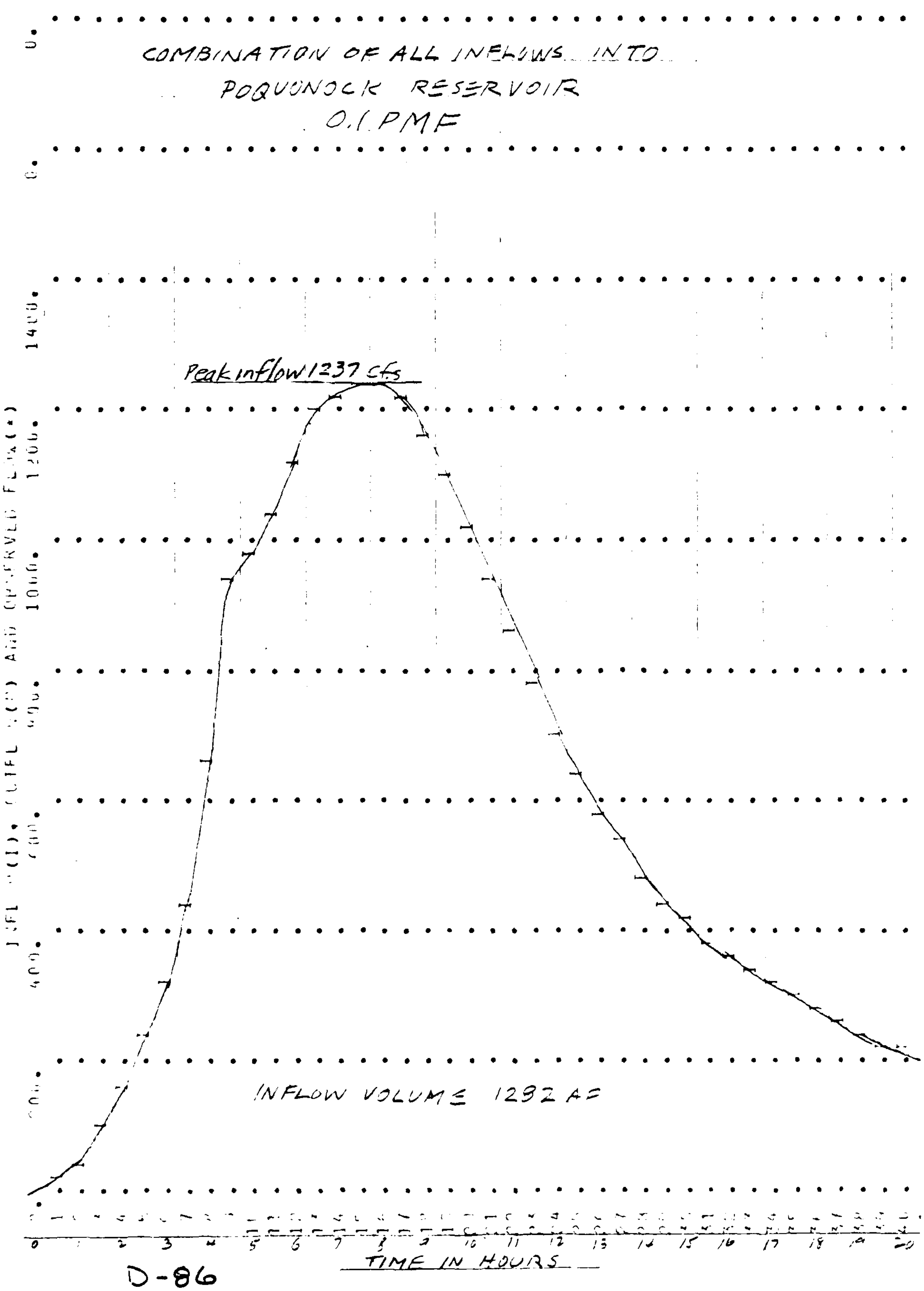
ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 0

14.	4[illegible].	[illegible].	105.	242.	326.	43[illegible].	670.	936.	576.
1[illegible]31.	11[illegible]7.	119[illegible].	1[illegible]15.	1232.	1237.	1216.	1166.	1098.	1022.
[illegible].	[illegible].	77[illegible].	7[illegible]5.	658.	561.	5[illegible]1.	487.	448.	415.
387.	[illegible].	332.	31[illegible].	2[illegible]0.	273.	256.	241.	227.	214.
19[illegible].	1[illegible]7.	178.	17[illegible].	1[illegible]3.	158.	153.	148.	144.	140.
13[illegible].	1[illegible]1.	128.	124.	120.	117.	113.	110.	107.	104.
101.	[illegible].	[illegible].	93.	[illegible]0.	88.	85.	85.	81.	79.
7[illegible].	74.	72.	70.	69.	67.	65.	63.	62.	60.
5[illegible].	57.	5[illegible].	54.	53.	51.	50.	49.	47.	46.
4[illegible].	44.	43.	41.	40.	39.	38.	37.	36.	35.
3[illegible].	[illegible]4.	33.	32.	31.	30.	30.	29.	28.	27.
27.	2[illegible].	25.	25.	[illegible]4.	23.	23.	22.	22.	21.
21.	2[illegible].	19.	19.	19.	18.	18.	17.	17.	16.
1[illegible].	15.	15.	15.	14.	14.	14.	13.	13.	13.
1[illegible].	1[illegible].	12.	11.	11.	11.	10.	10.	10.	10.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1257.	1121.	548.	21[illegible].	31602.
INCHES		0.74	1.44	1.69	1.70
AC-FT		556.	1088.	1279.	1282.

Sheet D-97


COMBINATION OF ALL INFLOWS INTO
POQUONOCK RESERVOIR
0.1 PMF
Peak inflow 1237 cfs
INFLOW VOLUME 1292 AF
STATION
1400.
1200.
1000.
400.
TIME IN HOURS
0
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
20

HYDROGRAPH ROUTING

ROUTING THROUGH POQUONOCK RESERVOIR C.I PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
9F	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
1.0	0.0	0.0	1	0

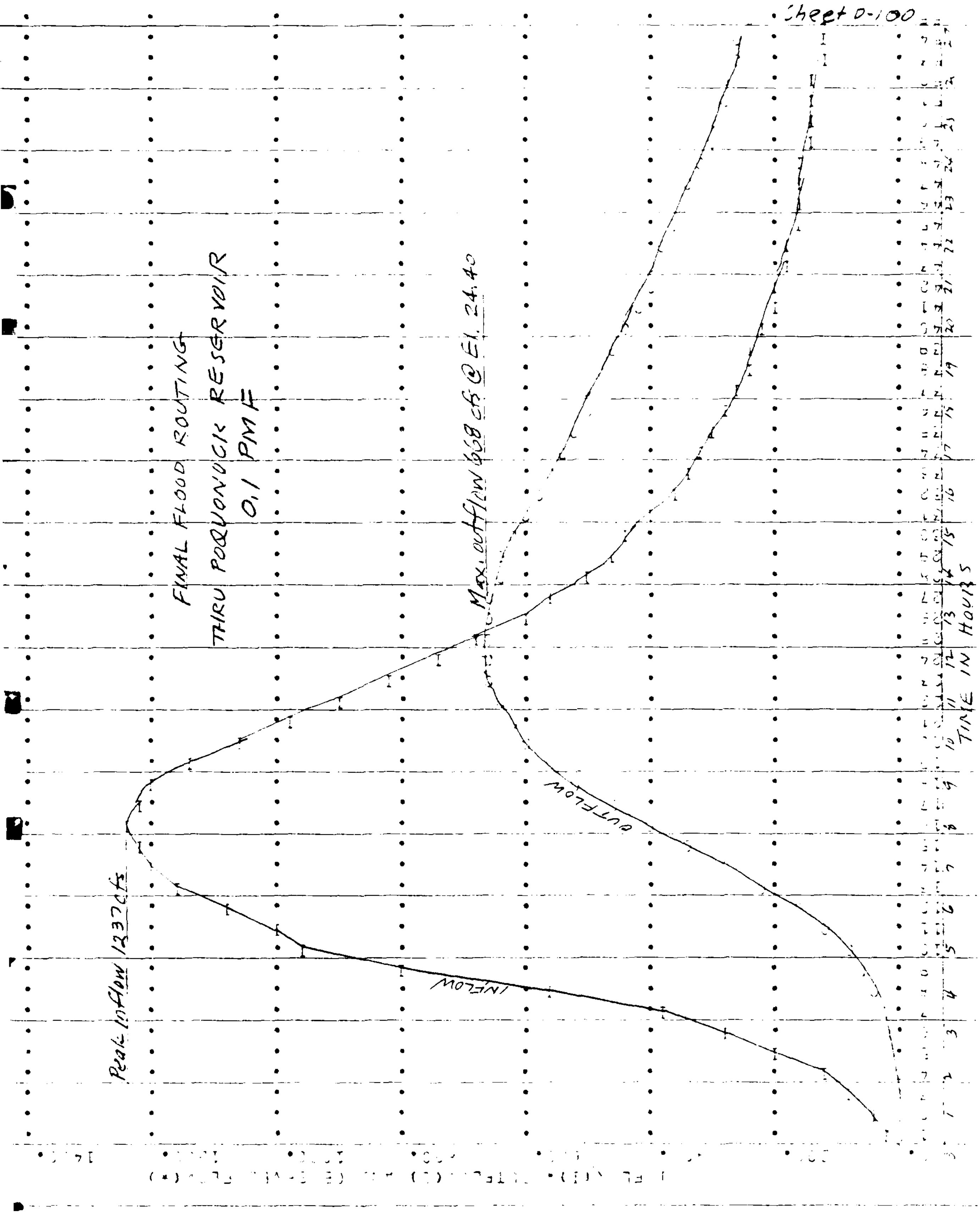
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	0.

STORAGE=	0.	94.	192.	257.	402.	682.	808.	985.	1321.	1675.
OUTFLOW=	0.	62.	146.	224.	476.	1005.	1289.	2046.	3962.	6405.

TIME	EOP STOR	AVG IN	EOP OUT
1	1.	14.	0.
2	2.	32.	1.
3	5.	72.	3.
4	10.	130.	6.
5	18.	204.	10.
6	29.	284.	16.
7	44.	380.	24.
8	66.	552.	36.
9	97.	807.	55.
10	143.	954.	90.
11	170.	1005.	125.
12	[illegible]	1077.	166.
13	[illegible]	1161.	213.
14	[illegible]	1207.	277.
15	327.	1225.	343.
16	[illegible]	1235.	406.
17	[illegible]	1227.	464.
18	434.	1191.	515.
19	448.	1156.	564.
20	[illegible]	1053.	601.
21	[illegible]	936.	629.
22	454.	830.	650.
23	[illegible]	815.	662.
24	[illegible]	739.	668.
25	[illegible]	671.	669.
26	[illegible]	611.	664.

27	497.	556.	656.	54	277.	126.	255.
28	491.	503.	645.	55	271.	122.	246.
29	484.	468.	631.	56	266.	118.	237.
30	476.	431.	616.	57	261.	115.	228.
31	468.	393.	600.	58	257.	112.	221.
32	458.	370.	583.	59	252.	109.	216.
33	449.	344.	565.	60	248.	105.	211.
34	439.	321.	546.	61	243.	102.	206.
35	429.	300.	526.	62	239.	100.	201.
36	420.	282.	509.	63	235.	97.	196.
37	410.	264.	491.	64	231.	94.	191.
38	400.	243.	473.	65	227.	92.	186.
39	391.	234.	456.	66	223.	89.	182.
40	381.	221.	440.	67	219.	87.	177.
41	372.	205.	423.	68	215.	84.	173.
42	363.	191.	407.	69	211.	82.	169.
43	354.	182.	391.	70	208.	80.	164.
44	345.	174.	376.	71	204.	78.	160.
45	337.	167.	361.	72	201.	75.	156.
46	329.	161.	347.	73	198.	73.	153.
47	321.	156.	334.	74	194.	71.	149.
48	314.	151.	321.	75	191.	70.	145.
49	307.	146.	308.	76	188.	68.	142.
50	300.	142.	297.	77	185.	66.	139.
51	294.	137.	286.	78	182.	64.	136.
52	288.	133.	275.	79	179.	62.	133.
53	283.	129.	265.	80	176.	61.	131.

Sheet D-99


Sheet D-100
FINAL FLOOD ROUTING
THRU POQUONOCK RESERVOIR
0.1 PMF
Max. outflow 658 cfs @ El. 24.40
Peak inflow 1237 cfs
INFLOW
OUTFLOW
TIME IN HOURS

SUMMARY FOR 0.1 PMF

[illegible]Y, AVERAGE FL[illegible]

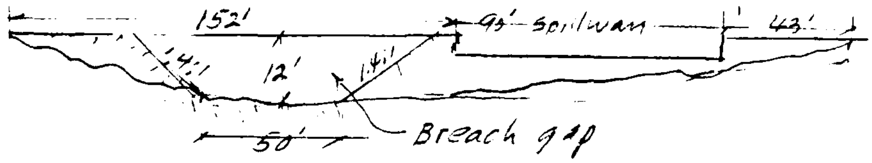
		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
[illegible] AT	1	[illegible]	[illegible]	[illegible]	59.	3.80
[illegible] T[illegible]	11	[illegible]	164.	11[illegible]	[illegible]	3.80
[illegible] AT	[illegible]	41[illegible]	[illegible]	[illegible]	21.	1.3[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	17[illegible]	78.	5.18
[illegible] TO	[illegible]	[illegible]	[illegible]	[illegible]	77.	5.1[illegible]
[illegible] AT	[illegible]	47[illegible]	[illegible]	14[illegible]	[illegible]	3.29
[illegible]	0	[illegible]	[illegible]	29[illegible]	127.	8.47
[illegible] AT	4	[illegible]	[illegible]	13[illegible]	44.	2.8[illegible]
[illegible]	[illegible]	1[illegible]71.	[illegible]	424.	171.	11.56
[illegible] AT	[illegible]	327.	[illegible]	[illegible]	22.	1.43
[illegible] T[illegible]	[illegible]	14[illegible]	[illegible]	64.	22.	1.43
[illegible]	0	121[illegible]	[illegible]	4[illegible]	193.	12.73
[illegible] APH AT	6	[illegible]	[illegible]	[illegible]	22.	1.43
[illegible]	0	1[illegible]47.	1121.	54[illegible]	215.	14.15
[illegible] TO	[illegible]	[illegible]	[illegible]41.	43[illegible]	30[illegible]	14.16

BY CDK DATE 3-1-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-102 OF

CHKD. BY ______ DATE ______ INSPECTION OF DAMS - CONN. & R.I. PROJECT ______

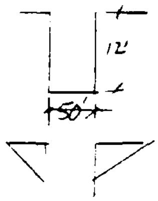
SUBJECT POQUONOCK RESERVOIR DAM - FAILURE ANALYSIS

BREACH FAILURE OF DAM



Breach failure per NEA "Rule of Thumb"

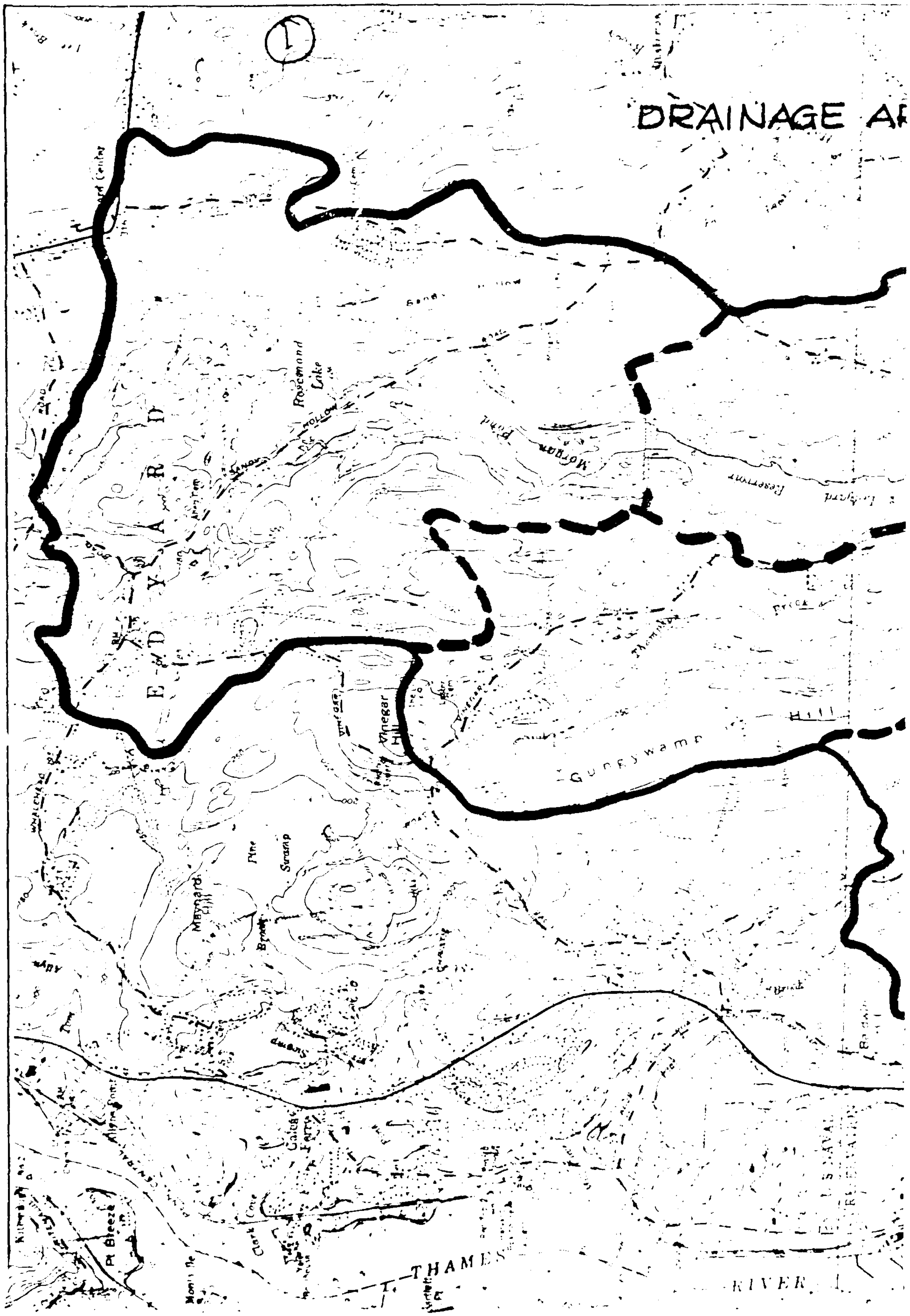
$$Q_P = \frac{8}{27} W_b \sqrt{g}\, y_0^{3/2} = 1.68\, W y_0^{3/2}$$



$Q = 1.68 \times 50 \times 12^{3/2} =$ 3492 cfs

$Q = 1.68 \times \frac{17}{2} \times 2 \times 12^{3/2} =$ 1187 cfs

4679 Say 5000 cfs


DRAINAGE A
L E D Y A R D
Rosemond Lake
Morgan Pond
Reservoir
Vinegar Hill
Gungywamp
Pine Swamp
Maynard Hill
THAMES
RIVER
Pt Breeze

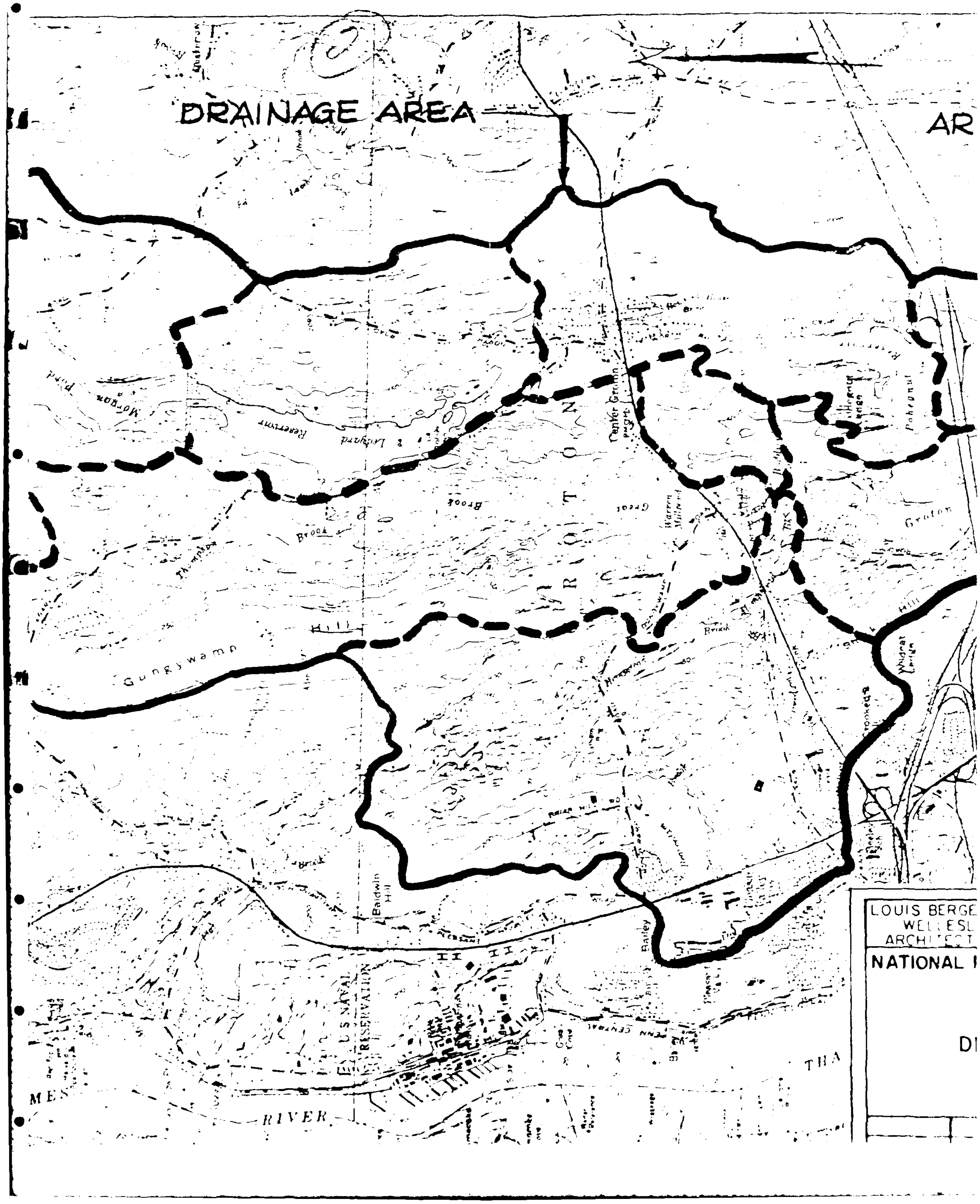
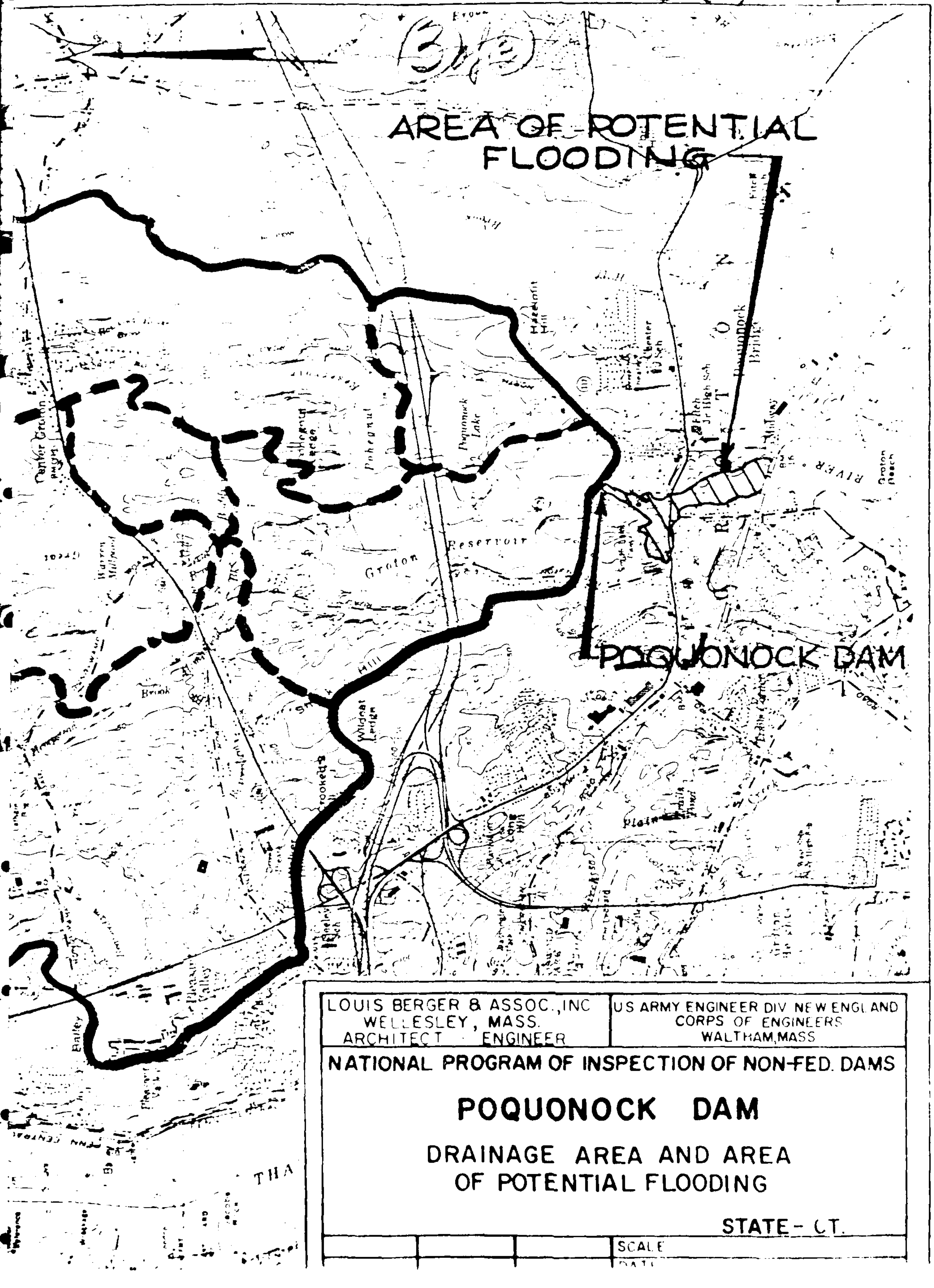

DRAINAGE AREA
AR
Morgan Pond
Reservoir
Center Groton
Warren Millpond
Brook
Groton
Thompson Brook
Hill
Gungywamp
Poheganut
Baldwin Hill
Bailey
U S NAVAL RESERVATION
MES
RIVER
THA
LOUIS BERGE
WELLESL
ARCHITECT
NATIONAL
DI

FIG. 5, D-11



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT ENGINEER	US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

POQUONOCK DAM

DRAINAGE AREA AND AREA OF POTENTIAL FLOODING

STATE - CT.

SCALE

DATE

APPENDIX E

INFORMATION AS CONTAINED IN THE
NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	DIVISION	STATE	COUNTY	CONGR DIST	STATE	COUNTY	CONGR DIST	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY MO YR
CT	231	NED	CT	011	02				POQUONOCK RESERVOIR DAM	4121.0	7202.0	16MAR79

POPULAR NAME	NAME OF IMPOUNDMENT
	POQUONOCK RESERVOIR

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	07	GREAT BROOK	GROTON	1	5000

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
GHREPG	1901	S	12	12	1660	900	NED	N	N	N	N	16MAR79

REMARKS
1#-FORMERLY GROTON RESERVOIR

D/S HAS	SPILLWAY CREST LENGTH	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
2	285	U	41	1160	3293											

OWNER	ENGINEERING BY	CONSTRUCTION BY
CITY OF GROTON	DAHOLL AND CRANDALL	

REGULATORY AGENCY DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE DAY MO YR	AUTHORITY FOR INSPECTION
LOUIS BERGER + ASSOCIATES, INC.	13NOV78	PL92-367

REMARKS

END

FILMED

8-84

DTIC