MERRIMACK RIVER BASIN

DERRY, NEW HAMPSHIRE

BIG ISLAND POND DAM

NH 470

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

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

AUGUST 1978

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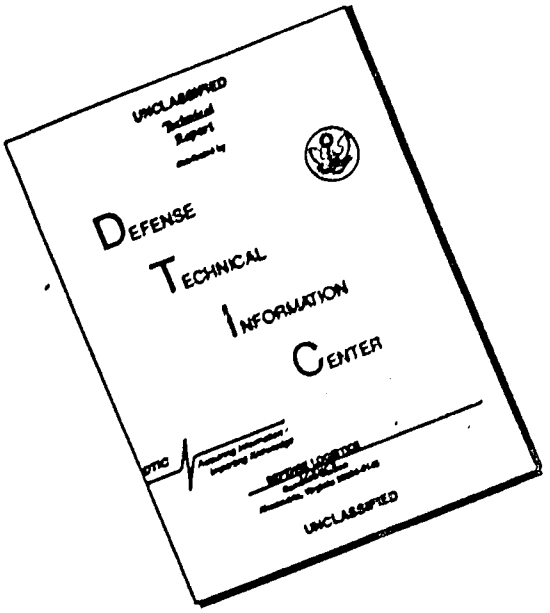

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Merrimack River Basin
Derry, New Hampshire
Spicket River

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

TCe dam is a stone masonry dam with earth abutments. THe dam is 80 ft. long with a maximum height of 10 ft. THe dam has an irregular configuration, having experienced various modifications and repairs. It is considered to be in the significant hazard category. The dam is assessed to be in overall fair condition. The owner should repair the gate and monitor the leaks, making repairs as required.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

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

REPLY TO
ATTENTION OF:

NEDED

JAN 8 1979

Honorable Hugh J. Gallen
Governor of the State of New Hampshire
State House
Concord, New Hampshire 03301

Dear Governor Gallen:

I am forwarding to you a copy of the Big Island Pond 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 Water Resources Board, the cooperating agency for the State of New Hampshire. In addition, a copy of the report has also been furnished the owner, Big Island Pond Corporation, c/o Mr. Warren Krupscewtz, Conley's Cove RFD 1, Westville, New Hampshire 03842.

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 Water Resources Board for your cooperation in carrying out this program.

Sincerely yours,

[illegible]
Colonel, Corps of Engineers
Division Engineer

BIG ISLAND POND DAM

NH 00470

MERRIMACK RIVER BASIN
DERRY, NEW HAMPSHIRE

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

PHASE I REPORT

NATIONAL DAM SAFETY PROGRAM

Name of Dam Big Island Pond Dam

State Located New Hampshire

County Located Rockingham

City or Town Salem

Stream Spicket River

Date of Inspection 6/7/78 and 6/28/78

Brief Assessment

Big Island Pond Dam is a stone masonry and concrete dam with earth abutments, constructed in 1925. The dam is located on the Spicket River watershed on Big Island Pond in the southeast corner in the Town of Derry, New Hampshire. The dam has a maximum height of ten feet and a length of eighty feet, including dual spillways of total length twenty-nine feet. A short four foot diameter discharge conduit is located on the left abutment, controlled manually by a sluice gate with hand crank operator. No plans, specifications, computations or construction records exist of the original project.

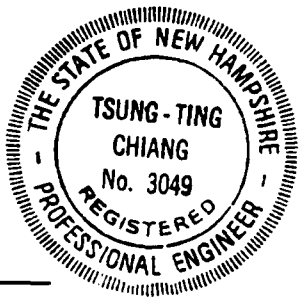
The dam has an irregular configuration, having experienced various modifications and repairs. The dam has been well maintained, although not all maintenance and repairs have been successful. The dam is in a "significant" hazard category, there being a small crossroads community about one mile downstream. However, should failure of the dam occur during a high flood condition, the flood wave generated could destroy Wheeler Dam downstream on the Arlington Mill Reservior, a high hazard dam.

Big Island Pond Dam is assessed to be in overall fair condition. A new gate mechanism is required along with other minor repairs. Several leaks through the dam and abutments must be monitored and/or repaired, and the flashboards must be redesigned to release reliably. Erosion protection to increase the dam's ability to withstand overtopping is needed.

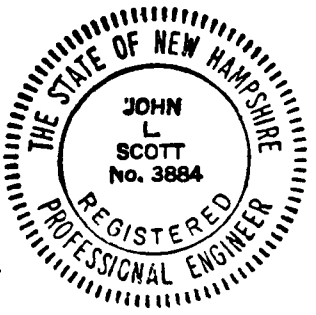
The spillway capacity at maximum pool elevation is about 1,300 c.f.s. The selected test flood (equal to the probable maximum flood) has a peak inflow into the pond of about 18,000 cfs and a peak outflow at the dam of about 10,500 cfs. This peak outflow would overtop the dam by about ten feet. Overtopping of this magnitude would surely wash out the dam, although it appears capable of resisting slight overtopping.

The owner should repair the gate and monitor the leaks, making repairs as required. The owner should retain competent professional advice to redesign the flashboards, design erosion protection, and to establish a warning system in the event of failure. The owner should also begin to keep permanent records of maintenance repairs and observations. These recommendations should be carried out within one to two years.

WHITMAN & HOWARD, INC.



T.T. Chiang, PhD., P.E.



John L. Scot, P.E.

This Phase I Inspection Report on Big Island Pond 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.

Charles G. Tiersch

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

Fred J. Ravens Jr.

FRED J. RAVENS, Jr., Member
Chief, Design Branch
Engineering Division

Saul Cooper

SAUL COOPER, Member
Chief, Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

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 aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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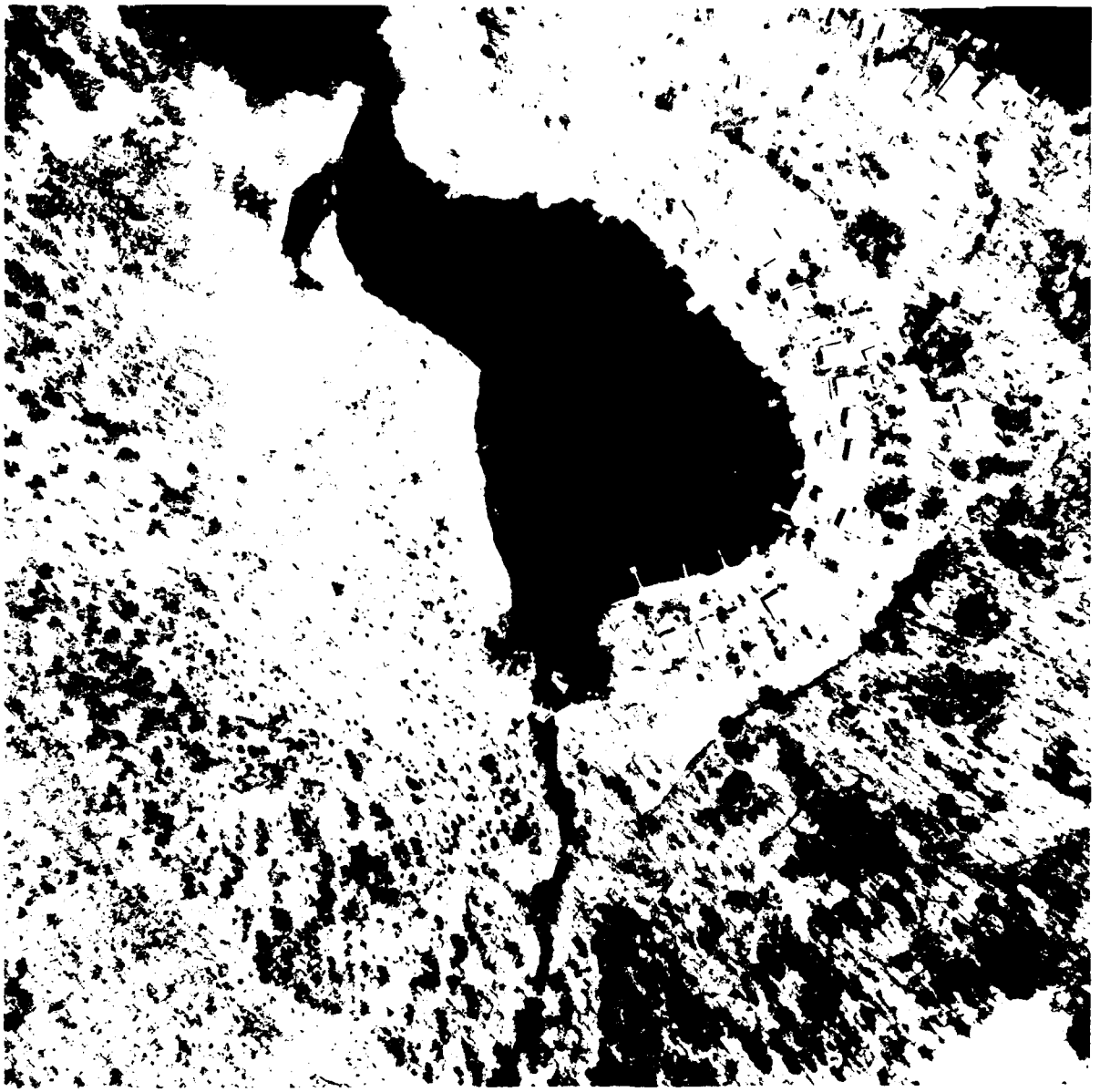
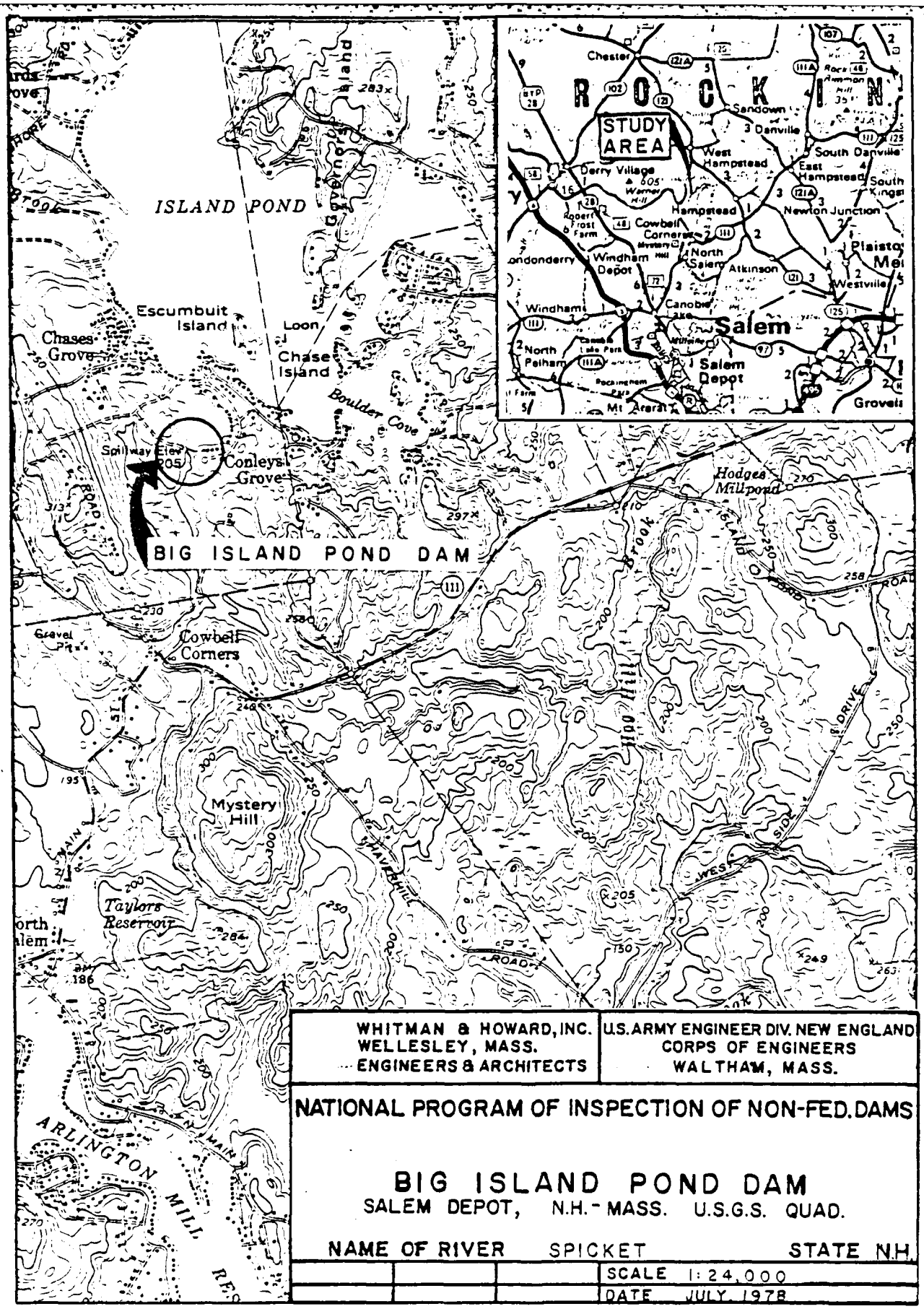


BIG ISLAND POND DAM

Derry, N.H.

Approx. Scale 1" = 280'



WHITMAN & HOWARD, INC. WELLESLEY, MASS. ENGINEERS & ARCHITECTS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

BIG ISLAND POND DAM

SALEM DEPOT, N.H. - MASS. U.S.G.S. QUAD.

NAME OF RIVER SPICKET STATE N.H.

SCALE 1:24,000

DATE JULY 1978

PHASE I INSPECTION REPORT

BIG ISLAND POND DAM

NH 00470

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. Whitman & Howard, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of New Hampshire. Authorization and notice to proceed was issued to Whitman & Howard, Inc. under a letter of May 1, 1978 from Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW33-78-C-0313 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) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

Town of Derry, N.H. U.S.G.S. Quadrangle "Salem Depot, NH-Mass". See Location Map.

b. Description of Dam and Appurtenances

Big Island Pond Dam consists of two adjacent stone masonry and concrete spillways connected to earth abutments. Dam height is 10 feet. The total spillway length is 29 feet and the total dam length is 80 feet. Flashboards, up to 2 feet high are usually used over the spillway aprons. A four foot diameter steel discharge conduit is situated on the left end of the spillway. The flow is controlled with a manually operated gate.

The dam is approximately 1600 feet south of the former natural outlet of Big Island Pond. Because of the dam, the level of water on the pond has been raised about 8 feet above its natural level. The discharge stream from Big Island Pond Dam flows through the small Taylor Reservoir into the Arlington Mill Reservoir. It is the farthest upstream dam of a series of dams and impoundments on the Spicket River watershed.

c. Size Classification

Although the height and mass of the dam is not great, the fairly large impoundment volume places it in the INTERMEDIATE class.

d. Hazard Classification

Significant (middle of three classes). Population in the immediate downstream area is sparce. The dam is a low structure, not likely to fail except under general flooding conditions. The floodwave produced by a dam failure would be low, though of high volume.

It must be mentioned that should a severe area-wide flood occur, and Big Island Pond Dam held a sufficient time to build an appreciable head differential and then failed, the resulting flood wave might easily destroy Wheeler Dam on Arlington Mill Reservoir, a dam in the high hazard class. Should Big Island Pond Dam fail early in this situation, the flood wave would probably not be strong enough to cause this "domino" effect.

e. Ownership

1977-Present	Big Island Pond Corp., an association of lakeshore property owners.
Mid-1950's -1977	Walter E. Stickney, North Salem, New Hampshire
1925-Mid-1950's	Arlington Mills, Lawrence, Mass. and its successors

f. Operator

Warren Krupscwetz
Conley's Cove RFD #1
Westville, NH 03892
603-893-8088

g. Purpose of Dam

The original purpose was to store and regulate water for Arlington Mills, an industrial complex in Lawrence, Mass. Since the mid-1950's, when the industry sold the dam and water rights, the dam has been operated for recreational purposes.

h. Design and Construction History

Big Island Pond Dam was built in 1925 by Arlington Mills of Lawrence, Massachusetts. Its purpose was to provide a discharge of water throughout the year to avoid dry weather shut-downs. As originally constructed the dam had 15.5 feet of concrete spillway.

In 1941 an additional 15 feet of spillway was constructed. Personnel from Arlington Mills maintained operation of the dam until the mid-1950's. The general practice was to fill the pond in the spring and then release the water downstream in the summer as needed.

The dam was purchased by Walter Stickney in the mid-1950's. In 1959, Mr. Stickney built a cofferdam at the original outlet of Big Island Pond and dredged the area between the cofferdam and the present dam as part of a development project. In 1977 the Big Island Pond Corporation, an association of landowners, purchased the dam.

i. Normal Operating Procedures

The normal yearly operational procedure is to begin drawdown on October 1st. The pond is usually lowered to elevation 200.5. The flashboards are left on year-round. In the spring run-off, the pond is allowed to fill and the gate is adjusted to regulate the flow. The pond is filled to an allowable maximum of 203.5 feet. However, the discharge may be reduced for reasons of downstream safety. After the spring runoff, the summer operation calls for a minimum discharge of 3 million gallons per day. This usually draws the pond down several feet during the summer season (in dry years it is more, in wet years less).

1.3 Pertinent Data:

a. Drainage Area - 16.7 square miles. Flat and rolling land with a few small ponds. No significant dams upstream.

b. Discharge at Damsite

Maximum known flood - Unknown

Discharge conduit capacity

at low pool elevation - 180 cfs
at maximum pool elevation - 200 cfs

Ungated spillway capacity - 1160 cfs

Total capacity - 1360 cfs

c. Elevation (ft. above MSL)

(1) Top Dam - 206.0

(2) Maximum pool - design surcharge -
204.0 (Max. legal)
203.5 (Max. normal)

(3) Full flood control pool - N/A

(4) Recreation pool - between 201 & 203

(5) Spillway crest - 201.6

(6) Upstream portal invert diversion tunnel - 195.5

(7) Streambed at centerline of dam - 195.5

(8) Maximum tailwater - unregulated

d. Reservoir

(1) Length of maximum pool - Est. 10,500 ft.

(2) Length of recreation pool - 10,400 ft.

(3) Length of flood control pool - N/A

e. Storage (acre-feet)

(1) Recreation pool - 2750 acre-ft. @ elev. 201.6

(2) Flood control pool - N/A

(3) Design surcharge - 3650 acre-ft. @ elev. 203.5

(4) Top of dam - 4950 acre-ft.

f. Reservoir Surface (acres)

(1) Top dam - est. 540

(2) Maximum pool - 510

(3) Flood-control pool - N/A

(4) Recreation pool - est. 480 to 500

(5) Spillway crest - est. 490

g. Dam

(1) Type - Concrete and stone masonry gravity dam with earth abutments

(2) Length - 80 ft.

(3) Height - 10 ft.

(4) Top width - varies

(5) Side Slopes - varies

(6) Zoning - Unknown

(7) Impervious core - Unknown

(8) Cutoff - Stone masonry core walls in embankments

(9) Grout curtain - none

h. Spillway

(1) Type - Broad crest, odd shape

(2) Length of weir - Total 28.8 ft.

(3) Crest elevation - 201.6 ft. msl

(4) Gates - None

(5) U/S Channel - None as such

(6) D/S Channel - Natural stream bed

(7) General - Spillway in two bays, built at different times.

i. Regulating Outlets - Single pipe at left abutment

(1) Invert - 195.5

(2) Size - 4 ft. diam.

(3) Description - Steel pipe thru dam

(4) Control Mechanism - Shear gate with hand crank operator

(5) Other - Permanent pond level gage (local datum). Gage indicator for gate opening.

SECTION 2 - ENGINEERING DATA

2.1 Design

There is no information on the design of the dam.

2.2 Construction

There is very little information available on the original construction of the dam. The only plan is a sketch. There is information and photographs available of the reconstruction of 1941. However, there is no data available as to the foundation preparation or embankment construction.

2.2 Operation

Records of operation of the dam are available. Water level records were kept by Arlington Mills and by the Island Pond Protective Association. The records are based on local gage elevations (known conversion to msl), and though not continuous, give a reasonable picture of normal conditions.

2.3 Evaluation

a. Availability - Poor. Very little available.

b. Adequacy - Poor. Evaluations must be based almost solely on visual observation.

c. Validity - Poor.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General

The findings of the inspection of the dam are presented on the visual inspection checklist. There are a few minor problems that should be monitored.

b. Dam

Minor seepage is taking place about one foot above the tailwater level at the base of the riprap along the northeast side of the downstream channel. There is a horizontal hole 2 feet long in the fill adjacent to the concrete wingwall at the southeast side of the downstream channel. There is sand and gravel on the downstream slope adjacent to the discharge conduit. Apparently, this material was recently placed on the dam as replacement for eroded material. Minor seepage was found just above the discharge conduit.

c. Appurtenant Structures

Railing slightly wobbly.

d. Reservoir Area

Island and old dam remnants 50' upstream.

c. Downstream Channel

Some overhanging trees.

3.2 Evaluation

The items noted during the inspection indicate potential problems, and should be monitored.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

The operation of the dam is summarized in Section 1.2.f. of this report.

4.2 Maintenance of Dam

The dam has been continuously and conscientiously maintained and patched as required. However, no maintenance records have been kept.

4.3 Maintenance Of Operating Facilities

The gate is in poor condition. The owners have plans to install a new gate in the fall of 1978.

4.4 Warning System

There is no warning system in effect.

4.5 Evaluation

The operating procedures are adequate.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design Data

No design data exists. The hydraulic criteria used by the design engineer are unknown. It is known that the dam increased the natural pond level by about 8 feet and increased the surface area from about 412 acres to about 510 acres.

b. Experience Data

No records have been kept of the dam's performance in flood situations.

c. Visual Observations

The right embankment rises fairly sharply. The left abutment rises more gradually into a dense woods. If the dam were overtopped, it is felt that the area beyond the approximately 80 foot width of the dam would not contribute much flow.

The dam appears capable of withstanding a small degree of overtopping, although a high level of overtopping would probably wash out the embankments, particularly the downstream face of the left embankment which in its present state is devoid of erosion protection.

d. Overtopping Potential

Reference is made to Appendix D for the hydrologic computations performed as a part of this report.

The peak inflow of the Probable Maximum Flood (PMF) is computed to be about 18,000 cfs. The PMF is defined as the largest flood there can reasonably be expected to occur on a given stream at a selected point, or the flood that may be expected from the most

severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

For dams of the size and hazard classification of Big Island Pond Dam, the "test flood" is generally selected between one-half the PMF and the full PMF. The "test flood" is that flood used to evaluate the hydraulic adequacy of a project. Due to the potential for damage to Wheeler Dam downstream, the test flood is chosen as the full PMF.

If Big Island Pond Dam does not fail, the peak outflow during the test flood would be about 10,500 cfs, the reduction from the 18,000 cfs peak inflow being accounted for by the surcharge storage "cushioning" effect of the relatively large impoundment. At the moment of peak outflow, the water surface would be about 10 feet over the top of the dam. At the same time, the tailwater would be about 1 foot below the top of the dam, creating an 11 foot hydraulic head across the crest.

The spillway capacity, including the capacity of discharge conduit, at a pool elevation just equal to the top of the dam, is about 1,300 cfs or 12% of the peak outflow during the test flood. It can therefore be seen that the overtopping potential is high.

If the test flood were chosen as one-half the PMF, the peak inflow would be about 9,000 cfs and the peak outflow would be about 4,300 cfs. Overtopping height would be about 4 feet and the spillway capacity would be 30% of the peak outflow. Overtopping potential would be judged as moderate.

SECTION 6 - STRUCTURAL STABILITY

a. Visual Observations. Two signs of minor instability were noted at the time of the inspection: a minor seepage at the northwest side of the downstream channel, and a horizontal hole was found in the sand-and-gravel fill at the downstream toe of the southeast embankment-section of the dam adjacent to the concrete wingwall at the southeast side of the downstream channel. These conditions should be monitored and remedial measures taken if the conditions change.

b. Design and Construction Data. There is no data available to evaluate the structural stability.

c. Operating Records. The operating records indicate that the dam is stable.

d. Post-construction Changes. Appurtenant items have been added and changed at various times with no formal record kept. The most recent change appears to be a sand-and-gravel fill placed on the downstream slope of the southeast embankment adjacent to the discharge pipe.

e. Seismic Stability. This dam is a Seismic Zone 2 and does not have to be evaluated for seismic stability, according to the COE Recommended Guidelines.

SECTION 7: ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition - There is no evidence which would suggest that Big Island Pond Dam is unstable. The dam is in overall fair condition.

b. Adequacy of Information - The lack of substantive design and construction information means that the evaluation must be based on visual observation and peripheral information.

c. Urgency - The recommendations and remedial measures mentioned below should be carried out within one to two years.

d. Necessity for Additional Investigation - No necessity.

7.2 Recommendations

The owner should:

(1) Repair or replace the gate mechanism as planned.

(2) Retain a competent engineer to design a flashboard pin arrangement which will reliably release before overtopping.

(3) Monitor the small leaks and apparent erosion and repair as necessary.

(4) Seek professional advice on establishing a warning system or plan in case of failure of the dam.

(5) Retain a competent engineer to design erosion protection to increase the dam's ability to withstand overtopping.

7.3 Remedial Measures

a. Alternatives - N/A

b. Operation and Maintenance Procedures

The present O&M procedures are adequate.

It is recommended that the owner adopt a program of regular observation visits by a responsible individual. Visits should be at least weekly and a permanent log kept.

BIG ISLAND POND DAM

APPENDICES

Appendix	Description
A	Visual Inspection Checklist
B	Engineering data with Index
C	Inspection Photographs with Index - 14 photos
D	Hydrologic Computations
E	Information as Contained in the National Inventory of Da

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Big Island Pond Dam DATE June 7, 1978

TIME 1:00 A.M.

WEATHER Sunny

W.S. ELEV. 203.3 U.S. Abt. 197 DN.S.

PARTY: *

1. T.T. Chiang, W & H
2. J. Scott, W & H
3.
4.
5.
6.
7.
8.
9.
10.

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Entire Dam	Chiang & Scott	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

* First visit - see next page for visit.
Check list combines notes of both visits.

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Big Island Pond Dam

DATE June 28, 1978

TIME 1:00 PM start

WEATHER sunny - hot

W.S. ELEV. 203.1 U.S. Abt. 197 DN.S.

PARTY:*

1. J. Scott, Whitman & Howard
2. R. Hirschfeld, Geotechnical Engineers, Inc.
3.
4.
5.
6.
7.
8.
9.
10.

	PROJECT FEATURES	INSPECTED BY	REMARKS
1.	All features	Scott & Hirschfeld	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

*Second visit - see previous page for first visit.

Check List combines notes of both visits.

PERIODIC INSPECTION CHECK LIST

PROJECT Biz Island Pond Dam DATE 6/7/78 and 6/28/78

PROJECT FEATURE Main Structure NAME Entire party

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	
Current Pool Elevation	203.3 on 6/7; 203.1 on 6/28
Maximum Impoundment to Date	Reportedly 204.8
Surface Cracks	None
Pavement Condition	No pavement
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Ok
Horizontal Alignment	Ok
Condition at Abutment and at Concrete Structures	Stone masonry needs repointing
Indication of Movement of Structural Items on Slopes	None
Trespassing on Slopes	Roadways come to dam from both side - bare ground
Sloughing or Erosion of Slopes or Abutments	None, but upstream and downstream slopes of southeast embankment are bare. Two-foot horizontal hole in fill at toe of slope adjacent to wingwall beside discharge pipe.
Rock Slope Protection-Riprap Failures	None
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	Minor seepage at downstream end of masonry wingwall on northwest side.
Piping or Boils	None
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None

PERIODIC INSPECTION CHECK LIST

PROJECT Big Island Pond Dam DATE 6/7/78 and 6/28/78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS-INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Apparently old natural channel of Spicket River - center of channel lines up with discharge pipe. Remnants of old mill dam lie about 50' upstream at island.
Slope Conditions	Ok
Bottom Conditions	Could not inspect. Island just upstream.
Rock Slides or Falls	None.
Log Boom	Bar rack over intake - bent up some, but still serviceable.
Debris	Very little - well maintained.
Condition of Concrete Lining	N/A
Drains or Weep Holes	N/A
b. Intake Structure	
Condition of Concrete	Stone masonry joint leaking from intake side thru pier wall to spillway apron.
Stop Logs and Slots	Existing gate scheduled for replacement in fall of '78.

PERIODIC INSPECTION CHECK LIST

PROJECT Big Island Pond Dam DATE 6/7/78 and 6/28/78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS-TRANSITION AND CONDUIT	
General Condition of Concrete	Stone masonry wing walls at pipe outlet. Leak just above top of discharge pipe.
Rust or Staining on Concrete	None.
Spalling	None.
Erosion or Cavitation	None.
Cracking	None.
Alignment of Monoliths	N/A
Alignments of Joints	N/A
Numbering of Monoliths	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Big Island Pond Dam DATE 6/7/78 and 6/28/78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS-OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	No outlet channel as such - natural stream bed.
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain Holes	
Channel	
Loose Rock or Trees Overhanging Channel	Trees overhanging channel downstream of dam, but it is fairly open and wide.
Condition of Discharge Channel	

PERIODIC INSPECTION CHECK LIST

PROJECT Big Island Pond Dam DATE 6/7/78 and 6/28/78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS-SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Concrete apron recently added at right spillway.
General Condition	Good
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Some small shrubs
Floor of Approach Channel	Main channel leads to discharge pipe. Island 50' upstream, with old dam remnants.
b. Weir and Training Walls	
General Condition of Concrete	Fair to good - repoint masonry.
Rust or Staining	None
Spalling	Very little
Any Visible Reinforcing	No
Any Seepage or Efflorescence	Some seepage - would be fixed by repointing masonry.
Drain Holes	None
c. Discharge Channel	
General Condition	Surface of spillway aprons show normal erosion - not bad.
Loose Rock Overhanging Channel	
Trees Overhanging Channel	Some - not bad.
Floor of Channel	Natural stream bed.
Other Obstructions	None

PERIODIC INSPECTION CHECK LIST

PROJECT Big Island Pond Dam DATE 6/7/78 and 6/28/78

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS-SERVICE BRIDGE	
a. Super Structure	Concrete plank with steel angle sides.
Bearings	Direct bearing on piers - small, no fancy structural connections needed
Anchor Bolts	
Bridge Seat	N/A
Longitudinal Memebers	N/A
Under Side of Deck	Ok
Secondary Bracing	N/A
Deck	Concrete surface ok
Drainage System	N/A
Railings	Rusty, a little wobbly.
Expansion Joints	N/A
Paint	Railing and other metal parts could use a coat of paint.
b. Abutment & Piers	
General Condition of Concrete	N/A
Alignment of Abutment	N/A
Approach to Bridge	N/A
Condition of Seat & Backwall	N/A

APPENDIX B

BIG ISLAND POND DAM

INDEX TO ENGINEERING DATA

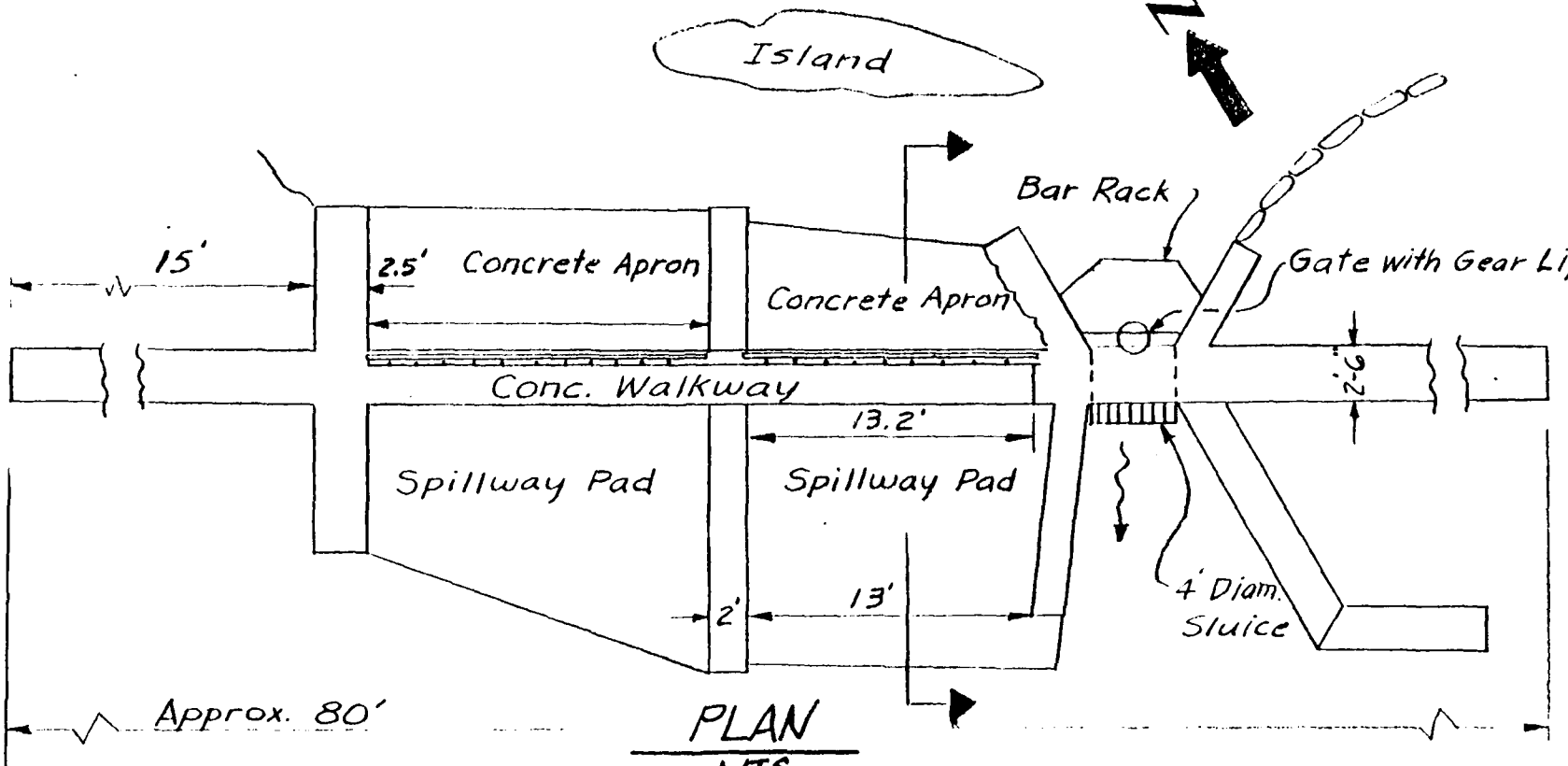
Sketch of Plan and Section

N.H. Water Resources Board memorandum, 10/10/74

N.H. Water Resources Board Dam Safety Inspection Report Form, 2/27/74

Letter indicating correlation between local gate and msl elevations, 9/19/58

Construction photographs of 1941 expansion of spillway



PLAN
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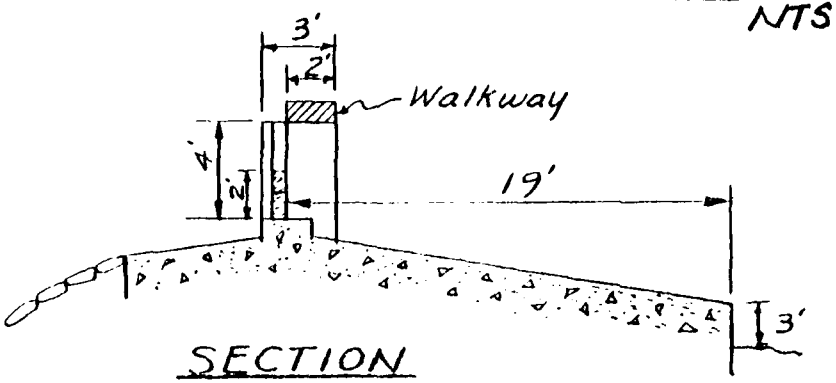


SECTION
NTS

WHITMAN & HOWARD INC. ENGINEERS AND ARCHITECTS WELLESLEY, MASS.	U.S ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

BIG ISLAND POND DAM

SPICKETT RIVER — NEW HAMPSHIRE

SCALE NTS

DATE JULY, 1978

M E M O R A N D U M

DATE: October 10, 1974

FROM: Zoes Dimos, Civil Engineer

SUBJECT: Walter Stickney Dam - Derry - #63.09

TO: Vernon A. Knowlton, Chief Water Resources Engineer

On October 9, 1974, I inspected the dam at the outlet of Big Island Pond. The pond was drawn down to 3.2 feet on the gauge.

The spillway (15' wide) on the right side has one inch diameter solid pins with a pin spacing of 1'7" center to center and three chains bolted to the catwalk. The flashboard in their present state are non-failing-

The left spillway (14' wide) has 1" solid pins spaced at 1'3" center to center with 3 chains bolted to the catwalk. The flashboards on this spillway are also non-failing. The flashboards should be replaced with failing flashboards which fail at an elevation of approximately one foot below the top of the dam.

The abutments are constructed of cut stone and are in rather poor condition. (see photos). I recommend that all the abutments be capped with reinforced concrete.

Due to the water by the gate section, I could not inspect the gate; however, it did seem to be in operable condition. The stone wall on the left side of the gate should be rebuilt, or a concrete wall constructed.

The concrete apron seemed to be in fair condition with signs of erosion at the downstream toe. I recommend that this be repaired, and cutoffs be constructed (if none are present), since the dam seems to be built on a gravel foundation. At the time of inspection, there was ± 3' of tailwater.

The dikes seemed to be in fair condition, with a concrete core wall; however, all trees on the dike should be removed and fill be placed on the dike where erosion is evident.

zd/js

N. H. WATER RESOURCES BOARD
Concord, N. H. 03301

DAM SAFETY INSPECTION REPORT FORM

Town: _____ Dam Number: _____

Inspected by: _____ Date: 2 27 19__

Local name of dam or water body: _____

Owner: _____ Address: _____

Owner was/was not interviewed during inspection.

Drainage Area: _____ sq. mi. Stream: _____

Pond Area: _____ Acre, Storage _____ Ac-Ft. Max. Head _____ Ft.

Foundation: Type EARTH, Seepage present at toe -/Yes/No, _____

Spillway: Type Stone, Freeboard over perm. crest: 4.0,

Width 15' & 14', ~~Flashboard~~ FLASHBOARD height 1.0',

Max. Capacity _____ c.f.s.

Embankment: Type Earth, Cover _____ Width _____,

Upstream slope 3 to 1; Downstream slope 2 to 1

Abutments: Type Stone, Condition: Good, /Fair/ Poor

Gates or Pond Drain: Size _____ Capacity _____ Type _____

Lifting apparatus Gate Stem Operational condition OK

Changes since construction or last inspection: _____

_____

Gate open at time of inspection

Downstream development: _____

This dam /would/ would not be a menace if it failed.

Suggested reinspection date: _____

Remarks: Dam leaks at [illegible]

_____

_____

Spillway 100 yr Flow calculated by USGS using comparable D.A. = 1700 cfs 350 (2-20-75)

September 19, 1958

Mr. Walter E. Stickney

Haverhill Road
North Salem, New Hampshire

Dear Mr. Stickney:

The elevation of the top of masonry east of gate section at Island Pond Dam, Derry, is 206.00', M.S.L. or 10.53' on the gauge. The mud sill ahead of the new fish screen is 0.00' on the gauge.

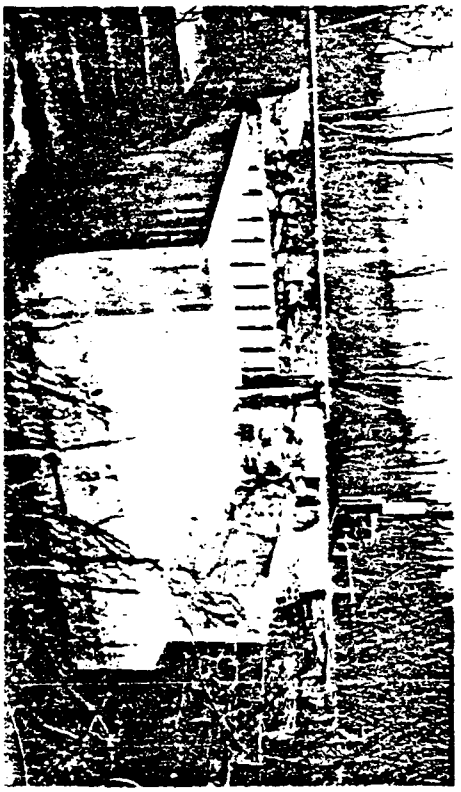
These are the questions unanswered after your recent call at the office.

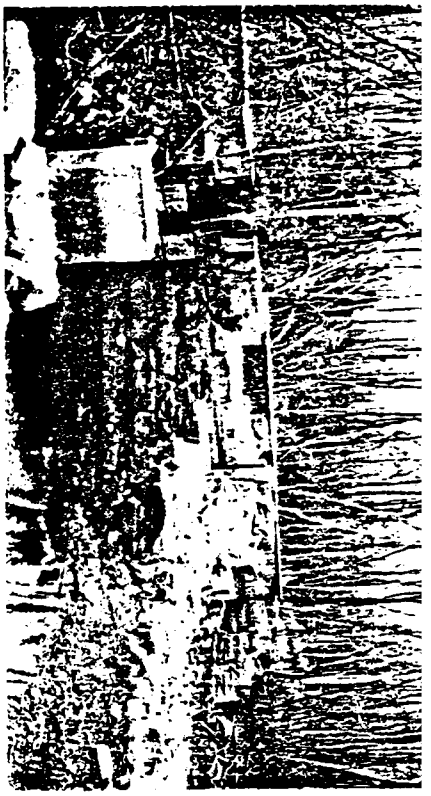
Sincerely,

Francis C. Moore
Civil Engineer

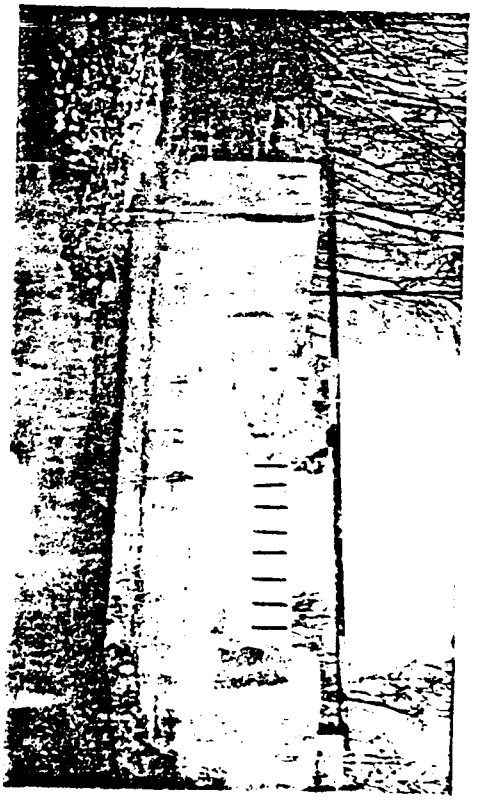
fcm:c

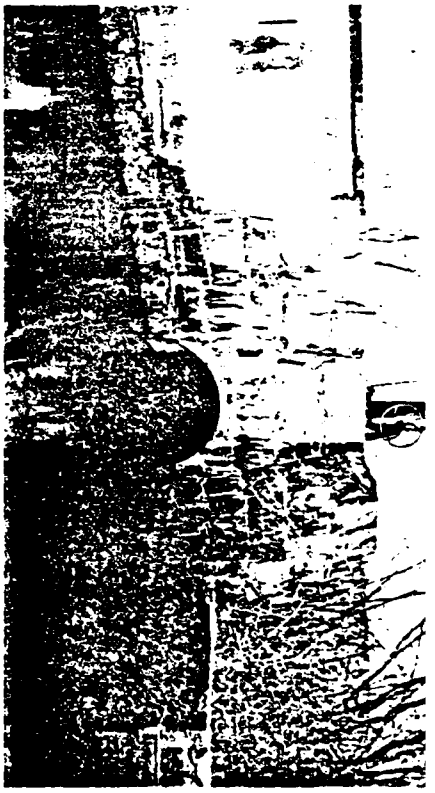
206.00
− 10.53
195.47 gage Datum





Constr. photos during dam expansion in 194





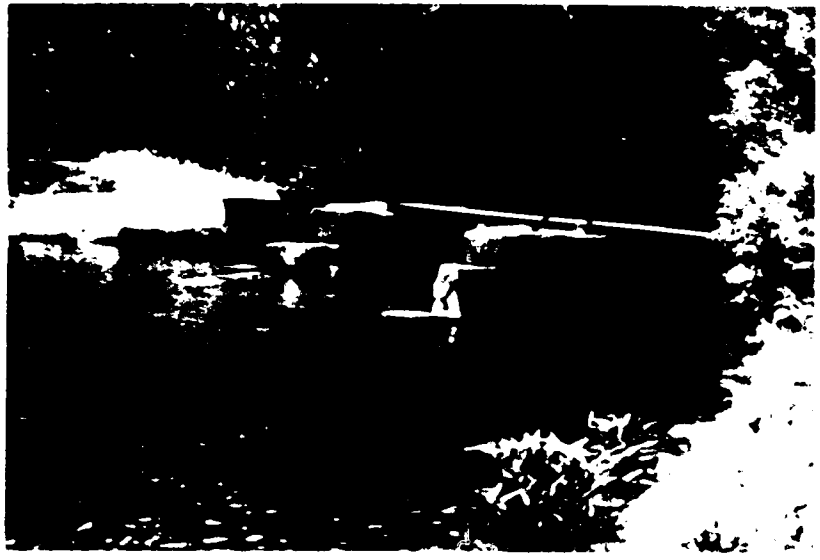
APPENDIX C

BIG ISLAND POND DAM

INDEX TO INSPECTION PHOTOGRAPHS

Photo No.	Description
1	View of dam from northwest side of approach channel showing southeast abutment and embankment section, discharge conduit operating mechanism, approaches to both spillway sections, and foot bridge.
2	View from downstream slope of northwest embankment section showing: downstream aprons of northwest (left) and central (center) overflow spillways, and discharge conduit outlet (behind left-hand tree).
3 - 5	Sequence of 3 photos taken clockwise from northwest edge of downstream channel showing: downstream side of northwest overflow spillway and pond in background (3); downstream side of central overflow spillway with service bridge at top of photo (4) and low-level outlet and southeast embankment section (5).
6	View from top of southeast embankment showing cutoff wall, gate mechanism and footbridge.
7	Shoreline upstream from southeast abutment. Enclosure is for recording equipment (not used).
8	View looking northwest along crest of dam, showing small tree and brush (to left of hand-railing on service bridge) growing at northwest edge of wingwall on the northwest side of the northwest overflow spillway section.

Photo No.	Description
9	Location of hole shown in photo 10. View is looking upstream toward downstream slope of embankment between outlet (to left of photo) and southeast abutment (to right of photo). Metal clipboard is lying in same spot as in 10 and hole is at edge of concrete wingwall.
10	Closeup of small hole extending into sand-and-gravel fill. (See 9 for location.) Hole is below clipboard and to the right. Six-foot rule is inserted straight into hole for 2 feet.
11	Discharge end outlet showing minor leakage from masonry joints (dark area just above water surface below center of photo and dark area at vertical boundary between sunlit and shadowed areas right of center of photo).
12	Island near center of upstream approach channel looking upstream from low-level outlet. Old mill dam is reported to have been located here - since destroyed, except for a few remnants.
13	Discharge apron of central section of overflow spillway showing concrete-and-masonry training wall on northwest side.
14	Minor seepage about one foot above tailwater level at base of riprap along northwest side of downstream channel immediately downstream of northwest overflow spillway. Seepage is below metal clipboard at left-center of photo.



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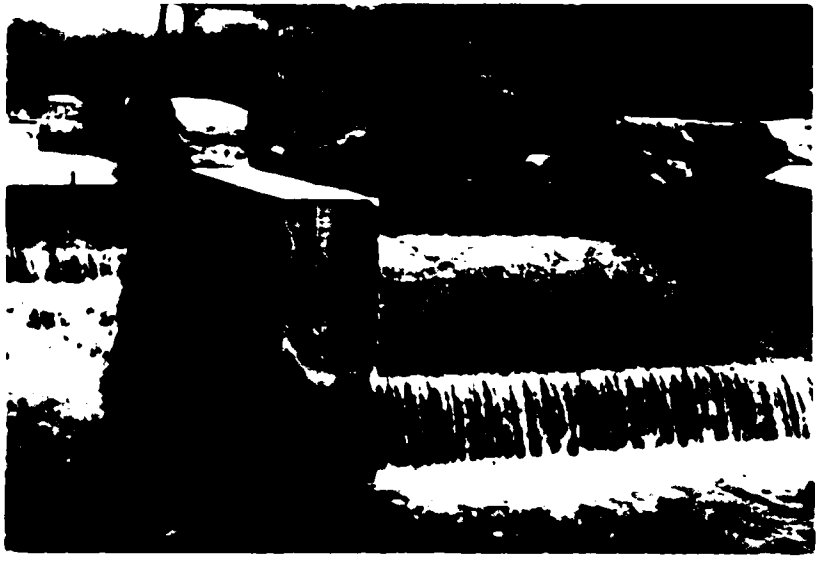

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APPENDIX D

BIG ISLAND POND DAM

HYDROLOGIC COMPUTATIONS

Big Island Pond

I. Hydrology & Hydraulic Data

a) Drainage Area : At dam site is 16.7 sq. miles including Ballard Pond and Wash Pond

b) Basin Slope : Main stream slope = $\frac{460-205}{5.5\times5280} = 0.0088$

Side Drainage Area Slope = $\frac{360-205}{2\times5280} = 0.0147$
(West)(Wash Pond side)

Side Drainage Area Slope = $\frac{570-205}{17920} = 0.0204$
(Ballard Pond side)

Conclusion: It should be classified as flat-rolling land type of drainage basin due to the presence of some small wet-land and ponds in the basin.

c) Water Surface Area: (neglecting Ballard Pond & Wash Pond water surface area) The water surface area for Big Island Pond is 510 acres at Elev. 203.47 and 412 acres at El. 195.47

d) Storage Capacity: Because Big Island Pond is a natural pond its total storage is unknown but from its gaging height (0' to 8', el. 195.47 to el. 203.47) its capacity as follows.

Elev.	Gage height (ft)	Volume (A-F)
195.47	0	0
197.47	2	900
199.47	4	1850
201.47	6	2750
203.47	8	3500

Therefore, the size of Big Island Pond is classified as Intermediate

Tailwater elevation is about 196 ±
Spillway El. 201.6, Top of Dam 206.0

BY T.T.C DATE 2 Aug 78 PROJECT Army Corps Engrs SHEET NO. 2 OF 10

CHKD. BY DATE Dam Inspection JOB NO. 8-084

e) Probable Max. Flood Flow

PMF : 650 cfs/sq. mile For flat area
: 1495 cfs/sq. mile For rolling land
Average = 1073 cfs/sq. mile

PMF for Big Island Pond = 1073 x 16.7 = 17,919 cfs
Say 18,000

f) Estimating Effect of Surcharge Storage on PMF, Using Spillway only.

The present spillway is 29' in length with estimate coeff. of 3.2. There is a 4' diameter steel pipe with gate.

With an average head of 8' the capacity of the pipe would be about

$$Q_p = \sqrt{\frac{8}{2.5}} \times 8.03 \times 4 \times 3.14 = 1.79 \times 100.8$$

$= 180.5$ cfs say max. at 200 cfs during peak flood flow.

Therefore, QP1 is reduced to 17,720 cfs

$$Q = CH^{3/2}L = 3.2\,H^{3/2} \times 29$$

$$H = \left(\frac{17720}{3.2 \times 29}\right)^{0.667} = 33.17 \text{ Ft} \qquad \text{overtopping at } 5.4'$$

$$STOR1 = 33.17 \times 510 \times 12 / 10691 = 18.99 \text{ inch.}$$

$$QP2 = QP1 \times \left(1 - \frac{18.99}{19}\right) = 17720(1 - 0.999) = 17.7 \text{ cfs}$$

$$STOR2 = \left(\frac{17.7}{3.2 \times 29}\right)^{0.667} \times 12 \times 510 / 10691 \quad \left(= 16.7 \times 10^3 / 1.5^2\right)$$

$= 0.19$ inch

$$\frac{STOR1 + STOR2}{2} = \frac{18.99 + 0.19}{2} = 9.59 \text{ inch}$$

$$QP3 = 17720\left(1 - \frac{9.59}{19}\right) = 17720 \times .495 = 8776 \text{ cfs}$$

$$H = \left(\frac{8776}{3.2 \times 29}\right)^{0.667} = 20.76 \text{ Ft} \qquad \text{Overtopping}$$

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g) Improvement.

Convert the whole length of dam into an overflow type dam.

Total length = 80' with C = 3.6 average.

then for QP1 surcharge height

$= \left(\frac{17720}{3.6 \times 80}\right)^{0.667} = 15.59$ Ft

$STOR1 = \frac{15.59 \times 1510 \times 12}{10691} = 8.92$ "

$QP2 = QP1\left(1 - \frac{8.92}{19}\right) = 17720 \times 0.531 = 9409$ cfs

Surcharge Height $= \left(\frac{9409}{3.6 \times 80}\right)^{0.6667} = 10.22$ Ft

$STOR2 = \frac{10.22 \times 12 \times 510}{10691} = 5.85$ inch

$\frac{STOR1 + STOR2}{2} = 7.39$ inch

$QP3 = QP1\left(1 - \frac{7.39}{19}\right) = 17720 \times 0.611 = 10827$ cfs

Surcharge Height $= \left(\frac{10827}{3.6 \times 80}\right)^{0.667} = 11.2$ Ft

h) Conclusion:

i) The possible collapse section is about 80 ft in length. If it were constructed as an overflow dam, then even with the peak flow, the dam will not collapse and the storage capacity will still be available, therefore, the damage will be limited to upstream flooding and downstream flooding due to the peak discharge of 10827 cfs. there will be no dam-break flood wave problem

ii) Based on Spicket River flood report, the river itself do not have the capacity to carry this type of flood therefore flooding problem will exist.

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iii) The Big Island Pond Dam is a low dam, but due to its large water surface area, the volume stored at the top 4 ft. is large, preventing the failure of the dam is important.

II. Supplemental Computation for rating curves:

a): Assume dam does not fail; but overtopping occurs:

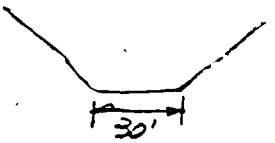
Estimated downstream channel capacity by assuming hydraulic gradient line parallel to channel slope = 0.013. Use Manning n of 0.05, the control section of the stream is about 1300 ft upstream from Cowbell Corner.

For Depth = 8 ft Top Width of Channel = 100'
Depth = 18 ft Top Width of Channel = 370'
Assume 30 ft bottom width

$D=8'$ $V = \frac{1.49}{0.05}(0.013)^{1/2}\left[\left(\frac{100+30}{2}\times 8\right)/(72+30)\right]^{2/3}$

$= 29.8 \times 0.114 \times 2.96 = 10.06$ ft/sec.

$Q = AV = 10.06 \times 520 = 5233$ cfs



$D=10'$ $V = 3.397 \times \left[\left(\frac{100+30+2\times 27}{2}\times 10\right)/(62.3+30+62.8)\right]^{2/3}$

$= 3.397 \times 3.27 = 11.11$ ft/sec

$Q = 11.11 \times 920 = 10,219$ cfs.

$D=12'$ $V = 3.397 \times \left[(720 \times \frac{12}{10} + 27\times 12)/210\right]^{2/3}$

$= 3.397 \times 3.589 = 12.2$ cfs

$Q = 12.2 \times 1428 = 17,412$ cfs

Crest elevation is only about 7' ft from bottom of channel. Top of dam is only about 12 ft from bottom of channel therefore spillway will be submerged, but dam can be assumed unsubmerged. Use El. 195 as bottom of downstream channel

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Spillway Max. Capacity $= 3.2 H^{3/2} \times 29$ $H = 206 - 201.6 = 5.4'$

$= 1,164$ cfs

Estimated Sluice gate outlet pipe capacity $= 180$ cfs

Total $1,344$ cfs

Neglecting submerged effect, we consider spillway has capacity of 1,300 cfs. Use $C = 3.0$ for overtopping condition:

Water Surface 2' above top of Dam (at El. 206)

$Q = 3.0 \times 51 \times 2^{3/2} + 3.2 \times 7.4^{3/2} \times 29 + 180$

$= 432 + 1868 + 180 = 2480$ cfs

Water Surface 4' above top of Dam (At El 210)

$Q = 432 \left(\frac{4}{2}\right)^{3/2} + 1868 \left(\frac{9.4}{7.4}\right)^{3/2} + 180$

$= 1222 + 2674 + 180 = 4076$ cfs

Water Surface 8' above top of Dam (at El. 214) *

$Q = 1222 (2)^{1.5} + 1868 \left(\frac{13.4}{7.4}\right)^{1.5} + 180$

$= 3456 + 4552 + 180 = 8188$ cfs

Water Surface 12' above top of Dam (At El 218)

$Q = 3456 \left(\frac{12}{8}\right)^{1.5} + 1868 \left(\frac{17.4}{7.4}\right)^{1.5} + 180$

$= 6349 + 6735 + 180 = 13,264$ cfs

Water Surface 14' above top of Dam (At El. 218

$Q = 3456 \left(\frac{14}{8}\right)^{1.5} + 1868 \left(\frac{19.4}{7.4}\right)^{1.5} + 180$

$= 8000 + 7929 + 180 = 16,109$ cfs

Water Surface 16' above $Q = 8000 \left(\frac{16}{8}\right)^{1.5} + 7929 \left(\frac{21.4}{19.4}\right)^{1.5} + 180$

$= 9774 + 9186 + 180 = 19,140$ cfs

* Water at that level, the actual width of water surface will be much more than 80 ft, but most additional flow will be overland flow, through trees, we neglect its quantity.

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b) Assume dam overtopping and failure. Neglect dynamic wave action;

If the dam fails when overtopping 4 ft, then flow through the channel is about 40 ft wide and 14 ft deep with velocity at least 20 ft/sec*, it will discharge a flow of

$$Q = 20 \times 40 \times 14 = 11200 \text{ cfs}$$

Also, the spillway would discharge another

$$Q = 3.2 \times 39 \times (9.4)^{3/2} = 2674 \text{ cfs}$$

The flood flow would be 14,000 cfs which is higher than the dam overtopping but not failure.

* The velocity is estimated; due to the Big Island Pond Dam is small - low dam, there probably only 4 - 6 feet hydraulic head difference, to dissipate this 4-6 ft of head in short distance, it would generate a velocity over 20 ft per sec.

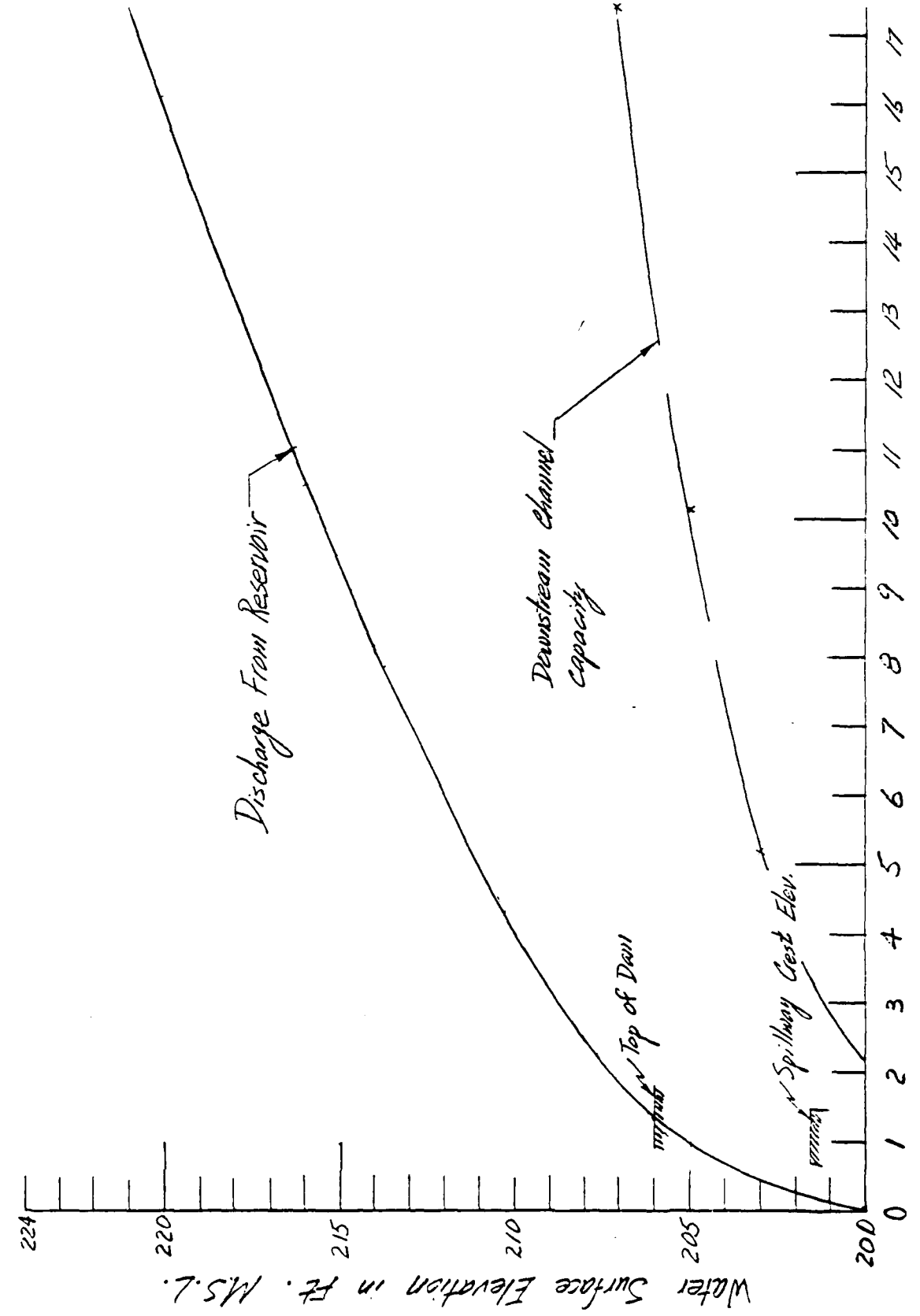
c) Rating Curve: The plotted rating curve can by no means provide a design curve for future use. This is a estimated curve for rough routing. It can be used for estimating purpose only.

d) Conclusions:
No earth fill dam shall be designed with overtopping, even with concrete core wall, since the core wall does not provide strength of the dam but serves as seepage loss control. Therefore, converting the dam into a gravity overflow type of dam is recommended, but due to its downstream channel capacity, the failure of dam may not create a high hazard, if the flood wave will not.

If dam failure is due to overtopping when water surface elevation in reservoir is higher than the estimated 4 ft. the flood flow would be much higher, it may even creat a flood flow higher than PMF peak flow 18,200 cfs.

BY T.T.C. DATE Aug 78 PROJECT Army Corps Engrs SHEET NO. 7

CHKD. BY ____ DATE ____ Dam Inspection Big Island Pond JOB NO. 2-0



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III Flood Routing - Rough routing with assumption that dam will not fail; then, it can be classified as significant hazard.

$QP1 = \frac{1}{2}\ PMF = 9000$ cfs

From rating curve, surcharge to elev. 214.6

$STOR1 = (214.6 - 201.6) \times 510 \times 12 / 10691 = 7.44$ inch

$QP2 = QP1\left(1 - \frac{7.44}{9.5}\right) = 1950$ cfs

$STOR2 = (207.2 - 201.6) \times 510 \times 12 / 10691 = 3.21$ inch

$STOR_{Ave} = \frac{3.21 + 7.44}{2} = 5.33$ inch

$QP3 = 9000\left(1 - \frac{5.33}{9.5}\right) = 3955$ cfs

On rating curve $H = 210 - 201.6 = 8.4$ ft

$STOR4 = 8.4 \times 510 \times 12 / 10691 = 4.81$ inch < 5.33

$QP4 = 9000\left(1 - \frac{4.81}{9.5}\right) = 4443$

$STOR5 = (210.5 - 201.6)\ 510 \times 12 / 10691 = 5.09$ inch

$STOR_{Ave} = \frac{5.09 + 4.81}{2} = 4.95$ inch

$QP5 = 9000\left(1 - \frac{4.95}{9.5}\right) = 4308$ cfs

From Rating Curve $H = 210.2 - 201.6 = 8.6$ ft which very close to 8.4 ft surcharge on QP3.

IV Surcharge Capacity Curve

Due to lack of survey data and storage capacity data, the curve computed here is only based on the known water surface area and U.S.G.S. map estimates. Therefore, it should be only considered as a rough estimate.

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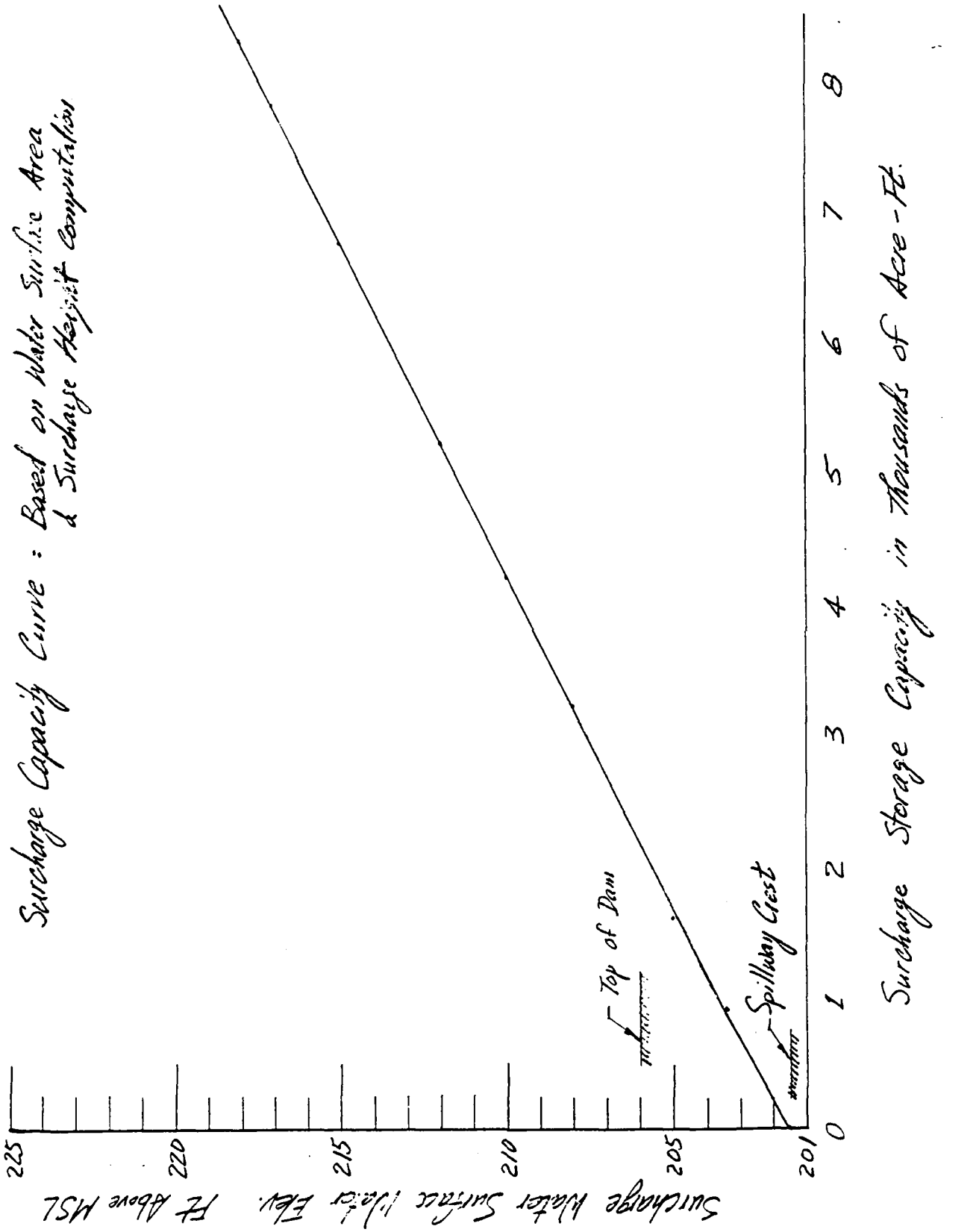
CHKD. BY ____ DATE ____ Dam Inspection - Big Island Pond JOB NO. 8-084



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I Surcharge Effect On PMF = Assume Dam Not Failure

$QP1 = 18{,}000$, from Rating Curve $H_1 = 221.5 - 201.6 = 19.9$ ft

$STOR1 = 19.9 \times 510 \times 12 / 10691 = 11.39$ inch

$QP2 = 18{,}000 \left(1 - \frac{11.39}{19}\right) = 7208$ cfs.

$H_2 = 213.1 - 201.6 = 11.5$ ft

$STOR2 = 11.5 \times 510 \times 12 / 10691 = 6.58$ inch

$STOR_{Ave} = \frac{6.58 + 11.39}{2} = 8.99$ inch

$QP3 = 18000 \left(1 - \frac{8.99}{19}\right) = 9486$ cfs

$H_3 = 215.1 - 201.6 = 13.5$ ft

$STOR_3 = 13.5 \times 510 \times 12 / 10691 = 7.73$ inch

$QP4 = 18000 \left(1 - \frac{7.73}{19}\right) = 10{,}678$ cfs

$H_4 = 216 - 201.6 = 14.4$ ft

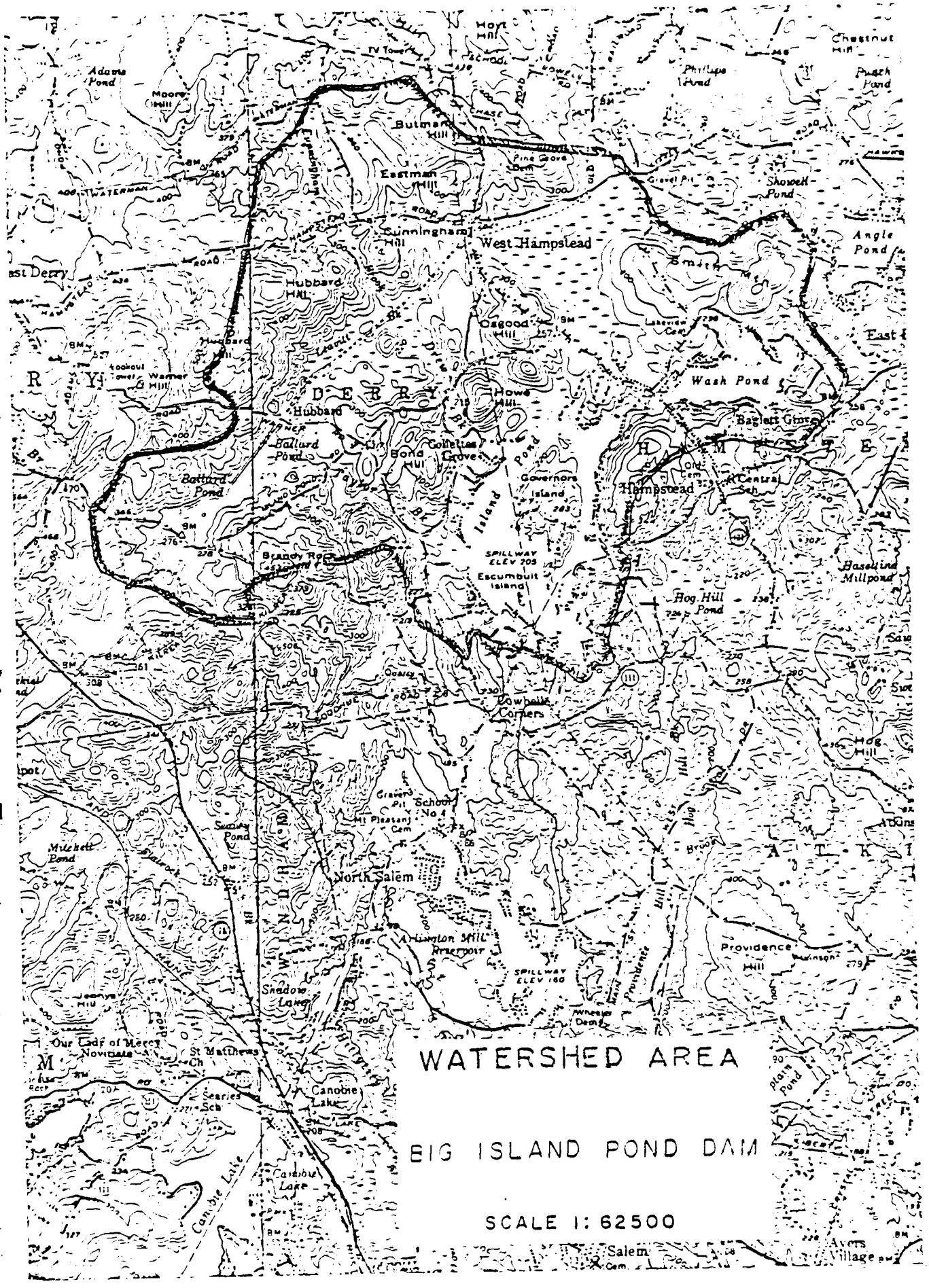
$STOR5 = 14.4 \times 510 \times 12 / 10691 = 8.24$ inch

$STOR_{Ave} = \frac{8.24 + 7.73}{2} = 7.99$ inch

$QP5 = 18000 \left(1 - \frac{7.99}{19}\right) = 10434$ cfs

Say 10500 cfs — Peak outflow Rate, if dam does not fail under about 14 ft of water above its spillway crest.

WHITMAN & HOWARD, INC.
45 WILLIAM STREET, WELLESLEY, MASS.
Engineers and Architects


WATERSHED AREA
BIG ISLAND POND DAM
SCALE 1: 62500
Hoyt Hill
Chestnut Hill
Adams Pond
Moore Hill
Phillips Pond
Peach Pond
Butman Hill
Eastman Hill
Pine Grove Cem
Gravel Pit
Showell Pond
Cunningham Hill
West Hampstead
Angle Pond
East Derry
Hubbard Hill
Osgood Hill
Lakeview Cem
Wash Pond
Warner Hill
Howe Hill
Baglett Grove
Ballard Pond
Bond Hill
Colletias Grove
Island Pond
Governors Island
Hampstead
Central Sch
Brandy Rock
SPILLWAY ELEV 703
Escumbuit Island
Haselind Millpond
Hog Hill Pond
Cowbells Corners
Hog Hill
Graves Pit
School No 4
Pleasant Cem
Sunday Pond
Mitchell Pond
North Salem
Arlington Mill Reservoir
Providence Hill
SPILLWAY ELEV 160
Wheeler Dam
Shadow Lake
Our Lady of Mercy Novitiate
St Matthews Ch
Searles Sch
Canobie Lake
Salem
Cem
Avers Village
Plains Pond

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
NH	470	NED	NH	015	02				BIG ISLAND POND DAM	4251.4	7112.8	15	AUG	78

POPULAR NAME	NAME OF IMPOUNDMENT
	BIG ISLAND POND

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	04	SPICKET RIVER	NORTH SALEM	1	400

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT.)	DIST	DAM	FED R	PRV/FED	SCS A	VER/DATE
CTRAPG	1925	SR	10	8	3650	2750	NED	N	N	N	N	04AUG78

REMARKS

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.)
1	80	C	29	720	450											

OWNER	ENGINEERING BY	CONSTRUCTION BY
BIG ISLAND POND CORP		

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NH WATER RES BD	NH WATER RES BD	NH WATER RES BD	NH WATER RES BD

INSPECTION BY	INSPECTION DATE DAY	MO	YR	AUTHORITY FOR INSPECTION
WHITMAN & HOWARD, INC	07	JUN	78	PL 92-367

REMARKS