QUINNIPIAK RIVER BASIN
WALLINGFORD, CONNECTICUT

SIMPSON POND DAM
CT 00630

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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

FEBRUARY, 1981

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<td>DAMS, INSPECTION, DAM SAFETY, Quinnipiac River Basin Wallingford, Connecticut</td>
<td>Simpson Pond Dam is a stone masonry and earth embankment structure approximately 300 feet long and 22.3 feet high. The dam is judged to be in fair condition with several areas that require attention. The dam is classified as SMALL and has a HIGH hazard potential. The test flood according to these guidelines ranges from ( \frac{1}{2} ) the PMF to the PMF.</td>
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Honorable William A. O’Neill  
Governor of the State of Connecticut  
State Capitol  
Hartford, Connecticut 06115

Dear Governor O’Neill:

Inclosed is a copy of the Simpson Pond Dam (CT-00630) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. The report is based upon a visual inspection, a review of past performance, and a preliminary hydrological analysis. A brief assessment is included at the beginning of the report.

The preliminary hydrologic analysis has indicated that the spillway capacity for the Simpson Pond Dam would likely be exceeded by floods greater than 15 percent of the Probable Maximum Flood (PMF). Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge fifty percent of the PMF, should be adjudged as having a seriously inadequate spillway and the dam assessed as unsafe, non-emergency, until more detailed studies prove otherwise or corrective measures are completed.

The term “unsafe” applied to a dam because of an inadequate spillway does not indicate the same degree of emergency as that term would if applied because of structural deficiency. It does indicate, however, that a severe storm may cause overtopping and possible failure of the dam, with significant damage and potential loss of life downstream.

It is recommended that within twelve months from the date of this report the owner of the dam engage the services of a professional or consulting engineer to determine by more sophisticated methods and procedures the magnitude of the spillway deficiency. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 24 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, round-the-clock surveillance should be provided.
NEDED-E
Honorable William A. O'Neill

I have approved the report and support the findings and recommendations described in Section 7, with qualifications as noted above. I request that you keep me informed of the actions taken to implement these recommendations since this follow-up is an important part of the non-Federal Dam Inspection Program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. This report has also been furnished to the owner of the project, Carabetta Management, Meriden, CT.

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

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

Sincerely,

C.E. EDGAR, III
Colonel, Corps of Engineers
Division Engineer
SIMPSON POND DAM
CT 00630

QUINNIPIAC RIVER BASIN
WALLINGFORD, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification Number: CT 00630
Name: Simpson Pond Dam
Town: Wallingford
County and State: New Haven County, Connecticut
Stream: Wharton Brook
Date of Inspection: October 23, 1980

BRIEF ASSESSMENT

Simpson Pond Dam is a stone masonry and earth embankment structure approximately 300 feet long and 22.3 feet high. The northern third of the downstream face of the dam is stone masonry either vertical or built in steps. The downstream face of the southern two thirds of the dam is earth, with 1:1 slopes and a crest width of approximately 10 feet. The main spillway is located near the northern end of the dam and is 42 feet long. There is also an auxiliary spillway at the northern end of the dam that is 55 feet long and 1 foot higher than the main spillway. There is a service bridge leading to a platform and gate which controls a low-level discharge pipe that passes through the base of the dam. The gate is operable and is used to lower the pond for maintenance purposes. There is an abandoned gate house on the earth embankment crest that was used to operate a power conduit. The power conduit discharges into the downstream channel approximately 300 feet from the dam. Presently, the pond is used for recreational purposes only. The drainage area is 3.1 square miles and the reservoir has 71 acre-feet of storage capacity.

The assessment of the dam is based on a visual inspection and hydraulic/hydrologic computations. The dam is judged to be in FAIR condition with several areas that require attention. These areas include seepage through the dam below and adjacent to the spillway, missing capstones on the spillway
weir, vegetation on the earth embankment and in the downstream channel and severe scouring of the northern downstream channel bank below the auxiliary spillway.

The dam is classified as SMALL and has a HIGH hazard potential in accordance with guidelines established by the Corps of Engineers. The test flood according to these guidelines ranges from 1/2 the Probable Maximum Flood (PMF) to the PMF. The test flood for this dam is 1/2 the PMF and is calculated to be 3,000 cfs. The spillway capacity at the top of the dam is 885 cfs or 30 percent of the test flood outflow. The test flood outflow will overtop the dam by 1.9 feet.

It is recommended that the owner engage the services of a qualified registered engineer experienced in the design of dams to investigate the seepage through the dam, supervise the removal of trees on the earth embankment, prepare a detailed hydraulic/hydrologic study to determine the spillway's adequacy and investigate means to prevent scouring of the downstream channel bank below the auxiliary spillway. It is also recommended that the Owner remove vegetation from the embankment and downstream channel, repair the banks and walls of the downstream channel, replace the capstones on the spillway weir, establish a formal warning system and initiate an annual technical inspection program.

The owner should implement the recommendations and remedial measures described above, and in greater detail in Section 7, within one year after receipt of this Phase I Inspection Report.

Joseph F. Merluzzo  
Connecticut P.E. #7639  
Project Manager

Gary J. Giroux  
Connecticut P.E. #11477  
Project Engineer
This Phase I Inspection Report on Simpson Pond Dam (CT-00630) 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 judgement and practice, and is hereby submitted for approval.

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, CHAIRMAN
Geotechnical Engineering 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 Inspections. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Inspection 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 investigations and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Inspection; 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 variety 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.

The Phase I Inspection does not include an assessment of the need for fences, gates, "no trespassing" signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with Occupational Safety and Health Administration's (OSHA) rules and regulations is also excluded.
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PHASE I INSPECTION REPORT
SIMPSON POND DAM CT 00630

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. Storch Engineers 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 were issued to Storch Engineers under a letter of October 30, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0035 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection -
   (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 prepare the states to quickly initiate 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 - Simpson Pond Dam is located in the Town of Wallingford, New Haven County, Connecticut. The dam and pond are adjacent to the intersection of Constitution Street and Center Street about 1/2 mile east of the center of town.
The coordinates of the dam are approximately 41°-27.05' north latitude and 72°-48.59' west longitude. The dam is located on Wharton Brook in the Quinnipiac River Basin.

b. Description of Dam and Appurtenances - Simpson Pond Dam is a stone masonry and earth embankment dam approximately 300 feet long and 22.3 feet high. About two thirds of the length of the dam is an earth embankment with 1:1 slopes and covered with brush and grass. The remainder of the dam consists of stone masonry. The upstream face was underwater so its slope could not be determined. The top of the dam is approximately 10 feet wide.

The main spillway is located near the northern end of the dam and is 42 feet long. At this location, the entire downstream face of the dam is stepped, stone masonry with a solid stone apron at the base. Adjacent to and north of the main spillway and approximately 1 foot higher is an auxiliary spillway approximately 30 feet long and extending to the end of the dam. The downstream face at this location is vertical stone masonry. Adjacent to the spillway is a service bridge that leads to controls for an operable 27-inch low-level discharge pipe that passes through the base of the dam. An abandoned gate house approximately 100 feet south of the spillway controls a power conduit that discharges into the downstream channel approximately 300 feet from the dam. Its operability is unknown.

c. Size Classification - Simpson Pond Dam has a maximum height of 22.3 feet and a maximum capacity of 71 acre-feet at the top of the dam. In accordance with the Recommended Guidelines for Safety Inspection of Dams established by the Corps of Engineers, the dam is classified as SMALL (height less than 40 feet, storage less than 1,000 acre-feet).

d. Hazard Classification - Simpson Pond Dam is classified as having a HIGH hazard potential. Failure of the dam could result in the loss of more than a few lives and cause significant property damage. Approximately 400 feet downstream,
the flood wave would strike an apartment complex. The first floor sill of the
apartments are approximately 6 feet above the streambed. Estimated flow and water
depth at this location just prior to dam failure is 885 cfs and 5 feet and just
after dam failure is 15,000 cfs and 10 feet. Therefore, the water level would rise
approximately 4.6 feet above the first floor sills.

e. Ownership - Simpson Pond Dam is owned by:

Carabetta Management
P.O. Box 240
Meriden, Connecticut 06450
(203) 237-7400

f. Operator - Operating personnel are under the direction of:

Mr. Elmer B. Howell
Silver Pond Apartments
656 Center Street
Wallingford, Connecticut 06492
(203) 265-5456

g. Purpose of Dam - The dam originally supplied power to the International
Silver Company. Presently, the pond and dam are used for recreational purposes
only.

h. Design and Construction History - Simpson Pond Dam was constructed
around 1880. No information is available on the design or construction of the dam.

i. Normal Operational Procedures - There are no operational procedures for
Simpson Pond Dam, however, the low-level discharge gate is operable and the operator
could lower the pond if necessary.

1.3 Pertinent Data

a. Drainage Area - The Simpson Pond drainage basin is located in the Town of
Wallingford, Connecticut and is irregular in shape. The area of the drainage basin
is 3.1 square miles (Appendix D - Plate 4). Approximately 5 percent of the drainage
basin is natural storage and about 30 percent is undeveloped. The topography is
rolling with elevations ranging from 350 (NGVD) to 115.0 (NGVD) at the spillway
crest.
b. Discharge at Damsite - There are no records available for discharge at the dam.

(1) Outlet works (conduit) size: 27 inches
   Invert elevation (NGVD): 102.5
   Discharge Capacity at top of dam: 95 cfs
(2) Maximum known flood at damsite: unknown
(3) Ungated spillway capacity at top of dam: 885 cfs
   Elevation (NGVD): 118.0
(4) Ungated spillway capacity at test flood elevation: 3,000 cfs
   Elevation (NGVD): 119.9
(5) Gated spillway capacity at normal pool elevation: N/A
   Elevation (NGVD): N/A
(6) Gated spillway capacity at test flood elevation: N/A
   Elevation (NGVD): N/A
(7) Total Spillway capacity at test flood elevation: 3,000 cfs
   Elevation (NGVD): 119.9
(8) Total project discharge at top of dam: 980 cfs
   Elevation (NGVD): 118.0
(9) Total project discharge at test flood elevation: 3,095 cfs
    Elevation (NGVD): 119.9

c. Elevation (feet above NGVD)

(1) Streambed at toe of dam: 95.7
(2) Bottom of cutoff: unknown
(3) Maximum tailwater: 100.7
(4) Normal pool: 115.0
(5) Full flood control pool: N/A
(6) Spillway crest (ungated): 115.0
(7) Auxiliary spillway crest: 116.0
(8) Design surcharge (original design): unknown
(9) Top of dam: 118.0
(10) Test flood surcharge: 119.9

d. Reservoir (length in feet)
(1) Normal pool: 1,200
(2) Flood control pool: N/A
(3) Spillway crest pool: 1,200
(4) Top of dam: 1,550
(5) Test flood pool: 1,700

e. Storage (acre-feet)
(1) Normal pool: 53
(2) Flood control pool: N/A
(3) Spillway crest pool: 53
(4) Top of dam: 71
(5) Test flood pool: 78

f. Reservoir Surface (acres)
(1) Normal pool: 5
(2) Flood control pool: N/A
(3) Spillway crest: 5
(4) Test flood pool: 7
(5) Top of dam: 7
g. Dam

(1) Type: stone masonry earth embankment
(2) Length: 300 feet
(3) Height: 22.3 feet
(4) Top width: 10 feet
(5) Side slopes: vertical and stepped at downstream masonry portion; 1:1 at downstream earth embankment
(6) Zoning: unknown
(7) Impervious core: unknown
(8) Cutoff: unknown
(9) Grout curtain: unknown
(10) Other: N/A

h. Diversion and Regulating Tunnel: N/A

i. Spillway

Main Aux.

(1) Type: masonry broad Same
crested weir
(2) Length of weir: 42 feet 55 feet
(3) Crest elevation 115.0 116.0
(4) Gates: N/A N/A
(5) U/S channel: none none
(6) D/S channel: stone and concrete apron-channel natural channel
(7) General: N/A N/A
j. Regulating Outlets

(1) Invert elevation (NGVD): 102.5

(2) Size: 27 inches

(3) Description: metal pipe

(4) Control Mechanism: manually operated gate

(5) Other: gate operable
SECTION 2 - ENGINEERING DATA

2.1 Design Data

No design computations or drawings are available for this dam.

2.2 Construction Data

The dam was constructed around 1880. No construction drawings or data are available for this dam.

2.3 Operation Data

The dam at one time supplied industrial power to the International Silver Company. Presently, the dam is used for recreational purposes only. The low level discharge gate is operable. No operating records for this dam have been maintained.

2.4 Evaluation of Data

a. Availability - No design, construction or operation data is available for this dam.

b. Adequacy - Since no information is available, a visual inspection and hydraulic/hydrologic computations were used to assess the condition of the facility.

c. Validity - The conclusions and recommendations found in this report are based on a visual inspection and hydraulic/hydrologic computations.
SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General - A visual inspection was conducted on October 23, 1980 by members of the engineering staff of Storch Engineers, D. Baugh and Associates, Inc. and Matthews Associates. A copy of the visual inspection checklist is contained in Appendix A of this report. Selected photos of the dam are contained in Appendix C. In general, the overall condition of the dam and its appurtenant structures is FAIR.

b. Dam - The dam is a stone masonry and earth embankment structure. The downstream face below the spillway is stone masonry built in a stepped fashion as shown in the Overview Photo. The southern two thirds of the dam is an earth embankment with a 1:1 slope and is covered with grass, brush and small trees (Photo 2). The upstream earthen face is primarily below the pond surface. That portion above water is covered with brush and trees (Photo 3).

There are several areas of seepage through and adjacent to the masonry face of the dam (Photos 5 and 7 - See Photo Location Plan Plate 3 for location). On the north side of the spillway, below the auxiliary spillway is a concrete buttress that has seepage beneath it. It is undermined and spalled. The stone masonry face below the south side of the spillway and near the toe has seepage also. The amount of seepage at all locations could not be measured. The seepage was clear and showed no signs of particle movement.

c. Appurtenant Structures - The main spillway is 42 feet long and the auxiliary spillway is 55 feet long (Photo 1). At the base of the main spillway is a solid stone apron. Several capstones are missing from the top of the main spillway and near the south abutment water is flowing under the capstones. The north abutment
is 1 foot above the main spillway. There is a 55-foot auxiliary spillway north of the main spillway, (Photo 1) with a chain link fence along the crest. This fence has debris collecting on the upstream side and does inhibit flow when the auxiliary spillway is in use. The downstream face is mortared stone masonry. There is a large scour hole in the downstream channel bank below the auxiliary spillway caused by water flowing over the auxiliary spillway (Photos 1 and 4).

A service bridge extends about 20 feet from the south abutment to a low level discharge gate (Photo 3). The bridge, consisting of wooden boards on steel beams and columns, is in good condition. The gate is kept locked to inhibit vandalism. The gate is operable and controls a 27-inch metal low-level discharge pipe that passes through the base of the dam (Photo 6).

There is an abandoned brick gate house on the earthen crest approximately 100 feet south of the spillway (Photo 2). The gate controls power conduit that discharges into the downstream channel approximately 300 feet from the dam. The system was apparently used for power supply at one time. The operability is unknown.

d. Reservoir Area - The area immediately adjacent to the pond is gently sloped and in a natural state. The shoreline shows no signs of sloughing or erosion. A rapid rise in the water level of the pond will not endanger life or property.

e. Downstream Channel - The downstream channel is natural with a stone masonry wall and a natural bank containing it (Photo 8). The northern bank near the dam are eroded somewhat and are covered with brush. Portions of the stone wall are out of alignment and in poor condition.

3.2 Evaluation

Overall, the general condition of the dam is FAIR. The visual inspection revealed items that lead to this assessment, such as:

a. Seepage through the dam below and adjacent to the spillway.

b. Missing capstones on the main spillway.
c. Spalled and undermined buttress.
d. Large scour hole in the bank of the downstream channel adjacent to the dam.
e. A fence along the crest of the auxiliary spillway.
f. Vegetation on the earth embankments and downstream channel.
SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures
   a. General - The operation of this facility was strictly for industrial power, but this purpose was abandoned sometime ago. Presently, the pond is used for recreation. The water level is controlled by the low-level discharge facility which is operable.
   b. Description of Any Warning System in Effect - There is no formal warning system in effect for this dam.

4.2 Maintenance Procedures
   a. General - There is no specific maintenance program for this dam.
   b. Operating Facilities - The gate and the discharge pipe are operable.

4.3 Evaluation
   There is no regularly scheduled maintenance program. A systematic and complete maintenance program should be instituted at the dam and a formal warning system should be developed.
SECTION 5 - EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

Simpson Pond Dam is a stone masonry and earth embankment dam approximately 300 feet long and 22.3 feet high. The northern third of the dam is stone masonry and the southern two thirds is an earth embankment. There is a 42-foot long main spillway near the northern end of the dam and adjacent to it and running to the north end of the dam is a 55-foot long auxiliary spillway. There is a service bridge extending about 20 feet from the south abutment that leads to a gate valve. This gate controls an operating low-level discharge pipe that passes through the base of the dam.

The watershed encompasses 3.1 square miles and is approximately 30 percent undeveloped. The topography is rolling with terrain rising 235 feet from the spillway crest.

The pond has a total capacity of approximately 53 acre-feet at the spillway crest and approximately 71 acre-feet when the pond is at the top of the dam.

5.2 Design Data

No design data is available.

5.3 Experience Data

No historical data for recorded discharges or water surface elevation is available for this dam, however, the dam has withstood past major floods such as; March 1936, September 1938 and August 1955 as well as January and February 1978 and January 1979. The flood of record in the Wallingford area resulted from the storm of September, 1938.

5.4 Test Flood Analysis

Based on the Recommended Guidelines for Safety Inspection of Dams, the dam is classified as a SMALL structure with a HIGH hazard potential. The test flood for
these conditions ranges from 1/2 the probable maximum flood (PMF) to the PMF. One half of the PMF was used for this dam because of the dam's small size.

Using guide curves established by the Corps of Engineers (rolling terrain), the test flood inflow is 3,050 cfs. The routing procedure established by the Corps' guidelines gives an approximate outflow of 3,000 cfs. The spillway capacity of the dam is approximately 885 cfs or 30 percent of the routed test flood outflow. The test flood will overtop the dam by 1.9 feet.

The water in the pond is basically uncontrolled and therefore the storage behind the dam was assumed to begin at the elevation of the spillway crest. Storage was determined by an average area depth analysis. Capacity curves for the spillway assumed a broad crested weir.

5.5 Dam Failure Analysis

A dam failure analysis was performed using the Rule of Thumb method in accordance with guidelines established by the Corps of Engineers. Failure was assumed to occur when the water level in the pond was at the top of the dam.

The spillway discharge just prior to dam failure is 885 cfs and the calculated dam failure discharge is 19,830 cfs.

Failure of Simpson Pond Dam could result in the loss of more than a few lives. Approximately 400 feet downstream of the dam is an apartment complex with first floor sill approximately 6 feet above the streambed. Estimated flow and water depths at this location just prior to dam failure is 885 cfs and 5 feet and just after dam failure is 1,500 cfs and 10.6 feet. Therefore, the water level would rise approximately 4.6 feet above the first floor sill of the apartments. Also, approximately 800 feet downstream are several homes with their first floor sills ranging from 4 to 6 feet above the streambed. Estimated flow and water depth at this location just after dam failure is approximately 10,000 cfs and 8 feet.
SECTION 6 - EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

The general structural stability of the dam is good as evidenced by the vertical, horizontal and lateral alignment. The stone masonry shows no movement although several capstones need to be replaced. The earth embankment portions of the dam also show no evidence of instability. The concrete buttress, below the auxiliary spillway is spalled and being undermined. The structural stability of the dam, however, can be affected by the items noted in Section 3.2.

6.2 Design and Construction Data

The dam was constructed around 1880. No plans or construction information are available for this dam.

6.3 Post-Construction Changes

The only post-construction change was the abandonment of the power supply gate house and conduit.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with Recommended Phase 1 Guidelines does not warrant a seismic analysis.
SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment
   
a. Condition - After consideration of the available information, the results of the inspection, contact with the owner and hydraulic/hydrologic computations, the general condition of the Simpson Pond Dam is FAIR.

   b. Adequacy of Information - The information available is such that the assessment of the safety of the dam was based on the visual inspection results and computations developed for this report.

   c. Urgency - It is considered that the recommendations and remedial measures suggested below should be implemented within one year after receipt of this Phase I Inspection Report.

7.2 Recommendations
   
The following recommendations should be carried out under the direction of a qualified registered engineer.

   a. Seepage through the dam and the spillway training walls should be investigated further to determine its origin and monitored to determine any changes.

   b. Trees, including stumps and root systems, should be removed from the crest and embankment slopes and backfilled with proper material.

   c. Investigate a means to prevent scouring of the downstream channel bank below the auxiliary spillway and the undermining of the buttress.

   d. Prepare a detailed hydraulic/hydrologic investigation to assess further the potential of overtopping the dam and the need for and the means to increase the project discharge capacity. Also, during this investigation, the engineer should determine the effect of the fence along the auxiliary spillway crest on its capacity.
7.3 Remedial Measures

a. Operation and Maintenance Procedures -

(1) Remove all brush from the earth embankment, within 20 feet of the toe of the dam and from the downstream channel.

(2) Repair and replace capstones on the main spillway weir.

(3) Repair stone walls and eroded banks of downstream channel.

(4) Institute a program of annual technical inspection by a qualified Engineer.

(5) Develop plans for around-the-clock surveillance for periods of unusually heavy rains and institute a formal downstream warning system for use in the event of an emergency.

7.4 Alternatives

There are no practical alternatives to the above recommendations.
APPENDIX A

INSPECTION CHECK LIST
# Inspection Check List

## Party Organization

**Project:** Simpson Pond Dam  
**Date:** 10/23/80  
**Time:** 10:30 a.m.  
**Weather:** Sunny, 40's  
**W.S. Elev.**  
**U.S.**  
**D.N.S.**

### Party:

2. Hermann Hani, SE, Technician  
3. Ben Cohen, SE, Civil  
4. Floyd Austin, DBA, Civil  
5. Peter Austin, DBA, Civil  
7.  
8.  
9.  
10.  

### Project Feature

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<th>Inspected By</th>
<th>Remarks</th>
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<td>Fair</td>
</tr>
<tr>
<td>2. Mechanical</td>
<td>M. Pozzato</td>
<td>Good</td>
</tr>
<tr>
<td>3. Spillway</td>
<td>G. Giroux</td>
<td>Fair</td>
</tr>
<tr>
<td>4. Discharge Channel</td>
<td>G. Giroux</td>
<td>Fair</td>
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<td>5.</td>
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A-1
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<td>DAM EMBANKMENT</td>
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<td>Crest Elevation</td>
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<td>Current Pool Elevation</td>
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## Inspection Check List

**Project:** Simpson Pond Dam  
**Date:** 10/23/80

### Area Evaluated

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<th>Outlet Works - Intake Channel and Intake Structure</th>
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<tr>
<td>Slope Conditions</td>
</tr>
<tr>
<td>Bottom Conditions</td>
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<tr>
<td>Rock Slides or Falls</td>
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<td>Log Boom</td>
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<td>Debris</td>
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<td>Drains or Weep Holes</td>
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<tr>
<td>Condition of Concrete</td>
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<td>Stop Logs and Slots</td>
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### Condition

- Underwater
- Underwater
### INSPECTION CHECK LIST

**PROJECT** Simpson Pond Dam  
**DATE** 10/23/80

**PROJECT FEATURE**

**DISCIPLINE**

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<td>Condition of Joints</td>
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<td>Rusting or Staining of Concrete</td>
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<tr>
<td>Any Seepage or Efflorescence</td>
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<td>Joint Alignment</td>
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<td>Emergency Gates</td>
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<td>Emergency Power System</td>
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<td>Wiring and Lighting System in Gate Chamber</td>
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**INSPECTION CHECK LIST**

**PROJECT**  Simpson Pond Dam  
**DATE**  10/23/80

**AREA EVALUATED**

<table>
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<th>OUTLET WORKS - TRANSITION AND CONDUIT</th>
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<td>Alignment of Joints</td>
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<tr>
<td>Numbering of Monoliths</td>
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A-5
## Inspection Check List

**Project:** Simpson Pond Dam  
**Date:** 10/23/80

### Area Evaluated

<table>
<thead>
<tr>
<th>Outlet Works - Spillway, Approach and Discharge Channels</th>
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<tbody>
<tr>
<td><strong>a. Approach Channel</strong></td>
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<tr>
<td>General Condition</td>
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<tr>
<td>Loose Rock Overhanging Channel</td>
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<tr>
<td>Trees Overhanging Channel</td>
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<tr>
<td>Floor of Approach Channel</td>
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<tr>
<td><strong>b. Weir and Training Walls</strong></td>
</tr>
<tr>
<td>General Condition of Concrete</td>
</tr>
<tr>
<td>Rust or Staining</td>
</tr>
<tr>
<td>Spalling</td>
</tr>
<tr>
<td>Any Visible Reinforcing</td>
</tr>
<tr>
<td>Any Seepage or Efflorescence</td>
</tr>
<tr>
<td>Drain Holes</td>
</tr>
<tr>
<td><strong>c. Discharge Channel</strong></td>
</tr>
<tr>
<td>General Condition</td>
</tr>
<tr>
<td>Loose Rock Overhanging Channel</td>
</tr>
<tr>
<td>Trees Overhanging Channel</td>
</tr>
<tr>
<td>Floor of Channel</td>
</tr>
<tr>
<td>Other Obstructions</td>
</tr>
</tbody>
</table>

### Condition

- Unknown - underwater
- None
- Underwater
- Fair - some capstones and mortar missing
- N/A
- Some through spillway
- None observed
- Fair
- None
- Some
- Fair contains rocks, bush, debris
- Downstream bridges
## Inspection Check List

**Project:** Simpson Pond Dam  
**Date:** 10/23/80

### Area Evaluated

<table>
<thead>
<tr>
<th>Outlet Works - Outlet Structure and Outlet Channel</th>
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<tr>
<td>Erosion or Cavitation</td>
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<tr>
<td>Visible Reinforcing</td>
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<td>Any Seepage or Efflorescence</td>
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<tr>
<td>Condition at Joints</td>
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<tr>
<td>Drain holes</td>
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<tr>
<td><strong>Channel</strong></td>
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<tr>
<td>Loose Rock or Trees Overhanging Channel</td>
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<tr>
<td>Condition of Discharge Channel</td>
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<tr>
<td>Outlet pipe discharges into spillway channel</td>
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**INSPECTION CHECK LIST**

**PROJECT** Simpson Pond Dam  
**DATE** 10/23/80

**PROJECT FEATURE**  
**NAME**

**DISCIPLINE**  
**NAME**

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<th>AREA EVALUATED</th>
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<td>Bearings</td>
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<td>Anchor Bolts</td>
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<td>Secondary Bracing</td>
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<td>b. Abutment &amp; Piers</td>
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<td>Alignment of Abutment</td>
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<td>Approach to Bridge</td>
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<td>Condition of Seat &amp; Backwall</td>
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A-8
APPENDIX B

ENGINEERING DATA
Any information pertaining to the history, maintenance and past inspection reports are located at:

State of Connecticut
Department of Environmental Protection
Water Resources Unit
State Office Building
Hartford, Connecticut 06115
APPENDIX C

PHOTOGRAPHS
PHOTO 1
TOP OF DAM - SPILLWAY - NORTH ABUTMENT

PHOTO 2
DOWNSTREAM FACE LOOKING NORTH

C-1
PHOTO 3
SPILLWAY - SOUTH ABUTMENT - CONTROL GATE

PHOTO 4
SPILLWAY - NORTH ABUTMENT

C-2
PHOTO 5
SEEPAGE - EROSION - DOWNSTREAM FACE

PHOTO 6
LOW LEVEL DISCHARGE Outlet
PHOTO 7
SEEPAGE - DOWNSTREAM FACE - LOW LEVEL DISCHARGE OUTLET

PHOTO 8
DOWNSTREAM CHANNEL
APPENDIX D

HYDRAULIC AND HYDROLOGIC COMPUTATIONS
Estimating the effect of surcharge storage on the Maximum Test Flood

1. \[ Q_{p1} = 3050 \text{ cfs} \]
2a. \[ H_1 = 4.9 \text{ ft} \]
   b. \[ \text{STOR}_1 = 164" \]
3c. \[ Q_{p2} = Q_{p1} (1 - \text{STOR}_1 / 9.5) = 3000 \text{ cfs} \]
3a. \[ H_2 = 4.9 \text{ ft} \]
   b. \[ \text{STOR}_2 = 164" \]
   c. \[ \text{STOR}_A = 164" \]
   d. \[ Q_{PA} = 3050 (1 + \text{STOR}_A / 9.5) = 3000 \text{ cfs} \]
   e. \[ H_A = 4.9 \text{ ft} \]
   f. \[ \text{STOR}_A = 164" \]

Test Flood = 3000 cfs

Capacity of the spillway when the pond elevation is at the top of the dam

\[ Q = 885 \text{ cfs} \text{ or } 30 \% \text{ of the Test Flood} \]
<table>
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<th>Elev</th>
<th>C</th>
<th>L</th>
<th>H</th>
<th>Q</th>
<th>C*</th>
<th>L</th>
<th>H</th>
<th>Q</th>
<th>C*</th>
<th>L</th>
<th>H</th>
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* due to fence, reduce to 2.0

**Stage Discharge**

**Top of Dam**

**Top of Aux Spillway**

Discharge (000 cu ft)
**Name of Dam:** Simpson Pond Dam

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<thead>
<tr>
<th>ELEV</th>
<th>DEPTH</th>
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<th>AVG. AREA</th>
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<td>10</td>
<td>10.5</td>
<td>12.7</td>
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**Diagram:**
- Test Flood El. 119.4
- Top of Dam El. 118
- Spillway El. 115

**Storage (Acre-Feet):**

```
90  100  110  120  130  140  150  160  170  180  190  200
```

**Date:**
- Calculated by: 12/3/80
- Checked by: 12/9/80
"Rule of Thumb" Guidance for Estimating Downstream Failure Hydrographs

NAME OF DAM

Section I at Dam

1. \[ S = \frac{71.2}{27} \text{ Acft} \]
2. \[ Q_{p1} = \frac{8/27 \cdot W}{\sqrt{g}} \cdot \frac{y^{3/2}}{1} = 8/27 \cdot 1.2 \cdot \sqrt{22.3} \cdot (22.3)^{15} = 19,830 \]
3. See Sections

Section II at

4a. \[ H_2 = \frac{11.4'}{2} \quad A_2 = 2,000 \quad L_2 = 410 \quad V_2 = 18.8 \quad \text{Acft} \]
   b. \[ Q_{p2} = Q_{p1} \cdot (1 - V_2/S) = 14,587 \quad \text{cfs} \]
   c. \[ H_2 = \frac{10.4'}{2} \quad A_2 = 1,630 \]
     \[ A_A = 1,815 \]
     \[ V_2 = 17.1 \quad \text{Acft} \]
     \[ Q_{p2} = 19,830 \cdot (1 - \frac{17.1}{11.2}) = 15,072 \]
     \[ H = 10.6' \]

Section III at

4a. \[ H_3 = \frac{9.6'}{2} \quad A_3 = \frac{(4.10+1.8)}{2} = 2,960 \quad L_3 = 290 \quad V_3 = 19.7 \quad \text{Acft} \]
   b. \[ Q_{p3} = Q_{p2} \cdot (1 - V_3/S) = 9,587 \quad \text{cfs} \]
   c. \[ H_3 = \frac{8.4'}{2} \quad A_3 = \frac{(3.80+1.2)}{2} = 2,450 \]
     \[ A_A = 2,710 \]
     \[ V_3 = 18.9 \quad \text{Acft} \]
     \[ Q_{p3} = 15,072 \cdot (1 - \frac{18.9}{11.2}) = 10,046 \]
     \[ H = 8.5' \]

Section IV at

4a. \[ H_4 = \frac{8.5}{2} \quad A_4 = 3,180 \quad L_4 = 290 \quad V_4 = 21.2 \quad \text{Acft} \]
   b. \[ Q_{p4} = Q_{p3} \cdot (1 - V_4/S) = 4,155 \quad \text{cfs} \]
   c. \[ H_4 = 6.2 \quad A_4 = 1,610 \]
     \[ A_A = 2,395 \]
     \[ V_4 = 15.9 \quad \text{Acft} \]
     \[ Q_{p4} = 10,046 \cdot (1 - \frac{15.9}{3.1}) = 5,621 \]
     \[ H = 6.9' \]

* Areas are averaged with preceding section.

D-4
Section V at

4a. \( H_5 = 6.9' \)
\[ A_5 = 1,610 \quad L_5 = 240 \quad V_5 = 8.9 \text{ Acft} \]

b. \( Q_{P5} = Q_{P4} (1-V_5/S) = 3.144 \text{ cfs} \)

c. \( H_5 = 5.6' \)
\[ A_5 = 1,780 \quad \frac{A_A}{A} = 1.445 \quad V_5 = 8.0 \text{ Acft} \]
\[ Q_{P5} = 5.621 (1 - 8.0/20.2) = 3.395 \]

Section VI at

4a. \( H_6 = \) 
\[ A_6 = \quad L_6 = \quad V_6 = \text{ Acft} \]

b. \( Q_{P6} = Q_{P5} (1-V_6/S) = \) 
\[ \text{ cfs} \]

c. \( H_6 = \) 
\[ A_6 = \quad \frac{A_A}{A} = \quad V_6 = \text{ Acft} \]

Section VII at

4a. \( H_7 = \) 
\[ A_7 = \quad L_7 = \quad V_7 = \text{ Acft} \]

b. \( Q_{P7} = Q_{P6} (1-V_7/S) = \) 
\[ \text{ cfs} \]

c. \( H_7 = \) 
\[ A_7 = \quad \frac{A_A}{A} = \quad V_7 = \text{ Acft} \]
\[ Q_{P7} = \]
$e = 2.2\%$

$n = 0.075$

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<th>R</th>
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<th>$S^2$</th>
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![Graph showing area (ft²) vs. flow (cfs) and D-6 flow characteristics](image)
APPENDIX E

INFORMATION AS CONTAINED IN
THE NATIONAL INVENTORY OF DAMS
NOT AVAILABLE AT THIS TIME