LOWER HUDSON RIVER BASIN

BASIC CREEK DAM

ALBANY COUNTY, NEW YORK
INVENTORY NO. N.Y. 84

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Basic Creek Dam (Inventory Number NY.84),
Lower Hudson River Basin, Albany County,

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED

NEW YORK DISTRICT CORP OF ENGINEERS

10 FEB 1981

10 10 1981
This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and visual inspection of Basic Creek Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property. The discharge capacity of the spillway is inadequate for all storms in excess of 52% of the PMF (Probable Maximum Flow).
Flood. During the 1/2 PMF event the water surface will approximate the top of dam elevation and the outflow will be 6801 cfs. The spillway is, therefore, assessed as "inadequate".
PREFACE

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

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

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

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PHASE 1 INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
BASIC CREEK DAM I.D. NO. NY 84  
LOWER HUDSON RIVER BASIN  
ALBANY COUNTY  

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National Dam Safety Program

Name of Dam: Basic Creek Dam (I.D. No. NY 84)
State Located: New York
County Located: Albany
Stream: Basic Creek (trib. of Catskill Ck & Lower Hudson River)
Date of inspection: October 24, 1980

ASSESSMENT

The examination of documents and visual inspection of Basic Creek Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property. The discharge capacity of the spillway is inadequate for all storms in excess of 52% of the PMF (Probable Maximum Flood). During the 1/2 PMF event the water surface will approximate the top of dam elevation and the outflow will be 6801 cfs. The spillway is, therefore, assessed as "inadequate".

The following problem areas were observed which require remedial action within 1 year of notification to the owner:

1. Repair the areas of deteriorated concrete which are leaking (approx. 50 gpm) between the 24 inch and 48 inch valves within the intake chamber.
2. Repair the deteriorated concrete and control the seepage within the diversion tunnel.
3. Monitor the seepage within the intake chamber, particularly above the 12 inch valve, and repair as required.
4. Repair the voids in the concrete spillway apron. Repair the construction joint material of the spillway and apron. Reinspect at least yearly and recaulk as necessary.
5. Monitor the seepage from the horizontal joints of the spillway. If seepage increases appreciably, investigate and repair.
6. Periodically monitor the concrete deterioration of the dam and appurtenances. Repair as required.
7. Periodically remove the debris in the downstream channel. Also remove the tree and brush growth to provide an unrestricted channel.
8. Remove the trees and brush on the slopes, crest and abutments of the embankments. Provide a program of periodic cutting and mowing of these surfaces.
9. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of all gates and valves. Document this information for future references. Also develop an emergency action plan for notification of downstream residents and the proper governmental authorities.

George Koch
Chief, Dam Safety Section
New York State Department of Environmental Conservation
NY License No. 45937

Approved By:

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

Date:
AUG 5 1981
Photo # 1.
BASIC CREEK DAM OVERVIEW.
SECTION I: PROJECT INFORMATION

1.1 GENERAL

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

b. Purpose of Inspection
Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to human life and property and recommend measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances
Basic Creek Dam consists of a 100 feet long concrete ogee spillway located near the left side of the dam, abutted by 2 homogenous earth embankments (left embankment = 134 feet, right embankment = 630 feet) with the maximum height of the dam above original ground surface being 21 feet. The upstream slopes of the embankment are 1 vertical: 3 horizontal, the downstream slopes are 1: 2.5, and the crest width is 15 feet. A berm was constructed at the toe of the downstream slopes at Elevation 930. The reservoir drain is located within the control building located at the right abutment of the spillway. An intake structure and diversion tunnel located northeast of the dam controls the flow to the Alcove Reservoir approximately 2 miles east of the dam.

b. Location
The dam is located on the Basic Creek, tributary to the Catskill Creek and the Lower Hudson River, within the Town of Westerlo, Albany County, New York.

c. Size
The dam is 21 feet high and impounds approximately 2200 acre-feet at spillway crest elevation. The dam is, therefore, classified as "intermediate" in size (1000 to 50,000 acre-feet).

d. Hazard Classification
The dam is classified as high hazard due to its location above the Village of South Westerlo.
e. Ownership
The dam is owned by the City of Albany, New York. The owner's representative is Mr. David F. Bruno, Commissioner, Department of Water and Water Supply, City of Albany, Quackenbush Square, Albany, NY 12207, telephone (518) 462-8661.

f. Purpose of the Dam
The dam impounds water for supply purposes to the City of Albany, NY.

g. Design and Construction History
The dam was constructed in 1928.

h. Normal Operating Procedures
Water Releases from Basic Creek Reservoir are normally passed over the spillway. When required, additional reservoir releases, through the intake structure and diversion tunnel, are provided to augment the storage capacity of Alcove Reservoir, which is located approximately 2 miles east of the dam.

1.3 PERTINENT DATA

a. Drainage Area (mi. 2) 19.46

b. Elevations (ft. USGS DATUM)
   Top of Dam 947.0
   Spillway Crest 925.0
   Invert Reservoir Drain 908.0

c. Reservoir (Acres; Acre ft.)
   Surface Area @ Top of Dam 320.
   Surface Area @ Spillway Crest 265.
   Storage @ Top of Dam 3922.
   Storage @ Spillway Crest 2199.

d. Dam
   Type: Homogenous earth with concrete core wall
   Length: (ft.): 765.
   Upstream Slope: 3:1
   Downstream Slope: 2.5:1
   Crest Width (ft.): 15.

e. Spillway
   Type: Uncontrolled concrete ogee.
   Weir Length (ft.): 99.
   Capacity @ Top of Dam (cfs.) 6967.

f. Reservoir Drain
   3 1/2 x 5 feet gated sluice way through concrete ogee section.
   Maximum Capacity @ Top of Dam (cfs) 600 cfs.
SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

The Basic Creek Reservoir Dam is located in the glaciated portion of the "Appalachian Uplands" physiographic province of New York State. This province (the Northern extreme of the Appalachina Plateau) was formed by the dissection of the uplifted but flat lying sandstones and shales of the Lower and Middle Devonian Period (395 to 365 million years ago). The plateau surface is represented by flat-topped divides with drainage generally southward. Drainage in the vicinity of the dam is southward toward Catskill Creek.

Glacial cover is generally thin, the deposits of which have resulted from glaciations during the Wisconsin glaciation, approximately 11,000 years ago.

The "Preliminary Brittle Structures Map of New York" developed by Yngvar W. Isachsen and William G. McKendree (dated 1977), indicates the presence of the following Lineon features:

1. A topographic Linear feature observed on one or more of the following: topographic map, Landsat (ERTS), Skylab, or U-2 Photographic product. This feature extends from the south side of the reservoir southward and west of the dam.

2. A tonal linear feature observed on a Landsat on U-2 photographic product. This feature extends northward from the north side of the reservoir.

2.2 SUBSURFACE INVESTIGATION

A subsurface investigation was conducted during the design of the structure which included 8 drillholes and 2 test pits. The locations and soil profiles of these explorations are shown on Drawings Nos. 3 and 4 which are indicated in Appendix F.

In general this investigation indicates that the subsurface soils at the dam are of glacial origin and composed of sand gravel and clay with varying quantities of boulders, over bedrock.

2.3 DAM AND APPURTENANT STRUCTURES

The dam was designed by Whitman, Requardt and Smith and also by Robert E. Horton in 1928. This design consists of a concrete gravity spillway abutted by 2 earth embankments. The configuration of the spillway is ogee, and is founded on bedrock. The left embankment consists of homogenous earth and a concrete cut-off and core wall atop a steel sheet piling cut-off wall. The entire upstream slopes are ripraped.

2.4 CONSTRUCTION RECORDS

There are no construction records or photos available.
2.5 OPERATION RECORDS

The Basic Reservoir is used for storage and diversion to Alcove Reservoir, however, in the recent past, it has been seldom used. Records can be found in the monthly water report to the Water Commissioner.

2.6 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from Mr. David F. Bruno, Commissioner, and Mr. Roger Niles of the Department of Water and Water Supply. Some plans and previous inspection reports were on file at Dam Safety, Department of Environmental Conservation, 50 Wolf Road, Albany.
SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General
Visual Inspection of Basic Creek Dam and the Watershed was conducted on October 24, 1980. The weather was clear and the temperature ranged in the thirties. The reservoir level at the time of the inspection was approximately 4 feet below the spillway crest.

b. Embankment
The earth embankment showed no signs of distress. There was no evidence of sloughing, sliding, depressions, misalignment erosion or seepage. The slopes and crest of the embankments are heavily vegetated. The riprap of the upstream slopes is in good condition.

c. Spillway
The uncontrolled ogee spillway located near the left end of the dam appears to be in good condition for the age of the structure. Slight surface deterioration was observed on the downstream face of the spillway. The maximum depth of this deterioration was 2 inches. Concrete patching was also noted near the center of the downstream face. The construction joint material has deteriorated. Two separate horizontal joints were observed on the downstream face of the spillway. One on the left side about 8 feet above the toe, and the other on the right side about 1.5 feet above the toe. These joints may have resulted from delays during pouring of the concrete. Seepage was observed emanating from the joints at a rate of less than 1 gallon per minute (gpm). The spillway buttress walls are slightly deteriorated. A new concrete buttress cap has been constructed which should slow the rate of this deterioration. Deterioration was also observed in the vicinity of the reservoir drain outlet. No seepage was evident in the reservoir drain system.

d. Downstream Channel
The outflow channel consists of a concrete chute changing to ripraped slopes further downstream. Voids were observed in the apron between the foot bridge and the spillway and the construction joint material was deteriorated. Some debris was also noted in the channel. Additional channel wall weeps should be installed to prevent the buildup of hydrostatic pressures.

e. Intake Structure and Diversion Tunnel
The intake and diversion tunnel is located on the east side of the reservoir approximately 1500 feet north of the dam. While the exterior of the intake system appeared to be in good condition, examination of the interior and the walls of the tunnel revealed the following conditions:
1. Extensive concrete deterioration was observed between the 24 and 48 inch valves. Leakage in excess of 50 gpm was flowing through the concrete. This concrete had a honeycomb appearance.

2. Calcification and seepage was noted on the walls of the diversion tunnel. These problems appeared to be concentrated along the upstream end of the tunnel.

3. Seepage was observed on the extreme right side of the gate chamber approximately 8 feet above the 12 inch valve.

f. Reservoir Drains
The reservoir may be lowered by the 12, 24, or 48 inch gate valves contained within the intake structure on the east side of the reservoir, or by the 42 x 60 inch sluice gate located on the right side of the spillway. All valves and gates were reported to be operational and have been operated within the past year.

g. Reservoir
No sedimentation problems or instability was reported within the reservoir area. Albany County Route #404 bisects the reservoir. This relatively low lying highway has experienced flooding during the high flow conditions. During these periods the owners representatives operate the reservoir drains to reduce the flooding potential.

3.2 EVALUATION OF OBSERVATIONS
The problem areas observed during the inspection and the recommended remedial actions are as follows:

1. The deterioration of the concrete within the intake chamber has created leakage in excess of 50 gpm. This area must be repaired as soon as possible to prevent failure of the valve system.

2. Calcification and seepage within the diversion tunnel was observed near the intake chamber. This area must be investigated and repairs instituted as required to prevent further deterioration of the tunnel.

3. Seepage was noted on the right wall of the intake chamber above the 12 inch valve. This seepage should be monitored and repairs initiated if necessary.

4. Voids were observed in the spillway apron. These areas must be repaired to inhibit undermining of the apron.

5. The deteriorated construction joint material in the spillway and apron must be recaulked.
6. Two horizontal joints were observed in the spillway in which seepage was occurring. These areas must be monitored. If seepage is increasing investigate the condition of the joints and institute repairs.

7. Periodically monitor the concrete deterioration of the dam and appurtenances. Repair as required.

8. Periodically remove the debris within the downstream channel.

9. Remove the trees and brush on the slopes, crest and abutments of the abutments of the embankments. Provide a program of periodic cutting and mowing of these surfaces.

10. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of all gates and valves. Document this information for future reference. Also develop an emergency action plan.
SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the crest of the spillway. Basic Creek Reservoir is storage reservoir whose purpose is to augment the Alcove Reservoir, which is an Albany water supply. Augmentation of the Alcove reservoir can be accomplished by discharges through the 12, 24, or 48 inch gate valves located in the intake structure on the east side of the reservoir.

4.2 MAINTENANCE OF THE DAM

Maintenance of the dam is provided by the owner. This maintenance is not considered satisfactory due to the deterioration and seepage of the concrete of the intake chamber, diversion tunnel, spillway and apron, deterioration of construction joint material, debris in the downstream channel, and vegetation on the slopes of crests of the embankments.

4.3 WARNING SYSTEM

There is no warning system in effect or preparation.

4.4 EVALUATION

The dam and appurtenances have been maintained in unsatisfactory condition as noted in Section 3: Visual Inspection."
SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Basic Creek Reservoir is located on Basic Creek, tributary to Catskill Creek and the Lower Hudson River. The total area of the watershed at the Basic Creek Dam is 19.46 square miles. The terrain is of moderate slope and heavily wooded.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 computer model. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation (PMP) used was 19.5" (24 hrs. 200 sq. miles) from Hydrometeorological Report #33 in accordance with recommended guidelines of the Corps of Engineers. The floods selected for analysis were 20, 40, 50, 60, 80, and 100% of the Probable Maximum Flood (PMF) flows. The PIF inflow 15,362 cfs was routed through the reservoir resulting in an onflow of 15,244 cfs.

5.3 SPILLWAY CAPACITY

The spillway is a 99. feet long concrete ogee section approximately 18 feet high with a crest elevation of 940. (USGS). Height of flow to top of dam can be 7 feet before overtopping occurs. The maximum outflow of the spillway is 6967 cfs. The outflow channel is a reinforced concrete chute which takes a bend to the right directing flow into the original streambed. The channel is crossed by a foot bridge for access to the gate house located on the right spillway abutement.

5.4 RESERVOIR CAPACITY

The reservoir capacities at the crest of the spillway and the top of dam are 2199 and 3922 acre feet respectively. Surcharge storage between spillway crest and top of dam is equivalent to 1.66" of runoff from the watershed.

5.5 FLOODS OF RECORD

There are no gaging stations on Basic Creek nor are there any historic events of extreme levels recorded. An adjacent basin was examined, Station Id: 01361570, Tennmile Creek at Oak Hill had 11. years of data. This was used in two flood frequency analysis for comparative purposes. These results are shown in Appendix C. These analysis resulted in the use of a higher basin characteristic coefficient (ct) and infiltration rate (0.2'hr) than normally used for New York State.

5.6 OVERTOPPING POTENTIAL

The maximum capacity of the spillway before overtopping occurs is 6967. c.f.s. which is 52% of the PMF. The dam is overtopped by 1.8 feet during the PMF event.
5.7 **EVALUATION**

The spillway of Basic Creek Reservoir will pass 52% of the PMF. By the Corps of Engineers Screening Criteria, it is considered inadequate.
SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of major distress were observed in connection with the earth embankments or the spillway. There are a number of problem areas, discussed in "Section 3: Visual Inspection," which if left uncorrected have the potential for the development of hazardous conditions.

b. Design and Construction Data

A structural stability analysis was conducted during the design of the dam by the engineers. This analysis is shown on Drawing No. 2 of 6 in Appendix f. The analysis assumes uplift pressures at the heel equal to 33% of the full head, and a horizontal top thrust of 5.9 kips per linear foot. The results of the analysis indicates that the resultant falls within the middle 1/3 of the base. The assumptions used during design are not appropriate by a current design standards. Therefore, the following analysis was conducted based on the Corps of Engineers Criteria.

<table>
<thead>
<tr>
<th>Case</th>
<th>Description of Loading Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal Operating Conditions, reservoir at El. 940 (spillway crest) full uplift, no tailwater.</td>
</tr>
<tr>
<td>2</td>
<td>Normal Operating Conditions with 7.5 k/h.f. ice load at El 938.</td>
</tr>
<tr>
<td>3</td>
<td>Water at 1/2 PMF level (El. 947) uplift as in case 1, weight of water on dam neglected, tailwater = 3.5 feet.</td>
</tr>
<tr>
<td>4</td>
<td>Water at PMF level (El. 949) uplift as in case 3, tailwater = 4.5 feet.</td>
</tr>
<tr>
<td>5</td>
<td>Normal Operating Conditions as in Case 1, with seismic forces of $a = 0.1$.</td>
</tr>
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<table>
<thead>
<tr>
<th>Case</th>
<th>Factor of Safety from toe</th>
<th>Location of Resultant from toe</th>
<th>Factor of Safety Sliding</th>
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<tr>
<td>1</td>
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<td>5</td>
<td>2.13</td>
<td>10.7</td>
<td>4.76</td>
</tr>
</tbody>
</table>

Location of middle 1/3 is 7.3 to 14.7 feet from the toe.

The results indicate that the spillway portion analyzed meets the recommended factors of safety for all loading conditions. Therefore, no further analysis is required at this time. Additional information concerning the structural stability analysis is included in Appendix E.
SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety
The Phase I Inspection of Basic Creek Dam did not reveal conditions which constitute an immediate hazard to human life or property. The embankments and spillway are not considered unstable. The dam, however, has a number of problem areas which require remedial action.

b. Adequacy of Information
The information reviewed is adequate for Phase I Inspection purposes.

c. Need for Additional Investigations
No additional investigations are required at this time.

d. Urgency
The areas requiring remedial action must be initiated within 3 months and completed within 1 year of notification to the owner.

7.2 RECOMMENDATIONS

1. Repair as soon as possible the areas of deteriorated concrete and leaking between the 24 inch and 48 inch valves within the intake chamber. Delay of repairs may result in failure of this area.

2. Repair the deteriorated concrete and control the seepage within the diversion tunnel.

3. Monitor the seepage within the intake chamber, particularly above the 12 inch valve, and repair as required.

4. Repair the voids in the concrete spillway apron to inhibit undermining.

5. Repair the deteriorated construction joint material of the spillway apron. Reinspect at least yearly and recaulk as necessary.

6. Monitor the seepage from the two horizontal joints of the spillway. If seepage increases appreciably, investigate and institute repairs.

7. Periodically monitor the concrete deterioration of the dam and appurtenances. Repair as required.

8. Periodically remove the debris within the downstream channel.

9. Remove the trees and brush on the slopes, crest and abutments of the embankments. Provide a program of periodic cutting and mowing of these surfaces.

10. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of all gates and valves. Document this information for future references. Also develop an emergency action plan for notification of downstream residents.
APPENDIX A

PHOTOGRAPHS
Photo #2
OGEE Section Spillway.
Note: Seepage and patching of concrete.

Photo #3
Downstream side of spillway.
Note: Several holes in floor and seepage.
Photo # 4
Left spillway abutment.

Photo # 5
Large void in channel floor.
Photo #6
Low level outlet through ogee section.
(3.5' x 5')

Photo #7
Spillway channel bending to the right towards original channel.
Photo # 8
Heavy tree and brush growth on downstream side of right embankment.

Photo # 9
Intake of diversion to Alcove reservoir (east side).
Photo # 10
Leakage around lines into diversion intake.
APPENDIX B

VISUAL INSPECTION CHECKLIST
VISUAL INSPECTION CHECKLIST

1) Basic Data
   a. General
      Name of Dam          BASIC CREEK DAM
      Fed. I.D. #          NY 84       DEC Dam No. 181-782
      River Basin         Lower Hudson
      Location: Town       Westerlo       County Albany
      Stream Name          Basic Creek
      Tributary of         Catskill
      Latitude (N)         __________
      Longitude (W)        __________
      Type of Dam          Homogenous earth & concrete cutoff
      Hazard Category      high
      Date(s) of Inspection Oct 29, 1980
      Weather Conditions   clear, so.
      Reservoir Level at Time of Inspection 4' below normal
   b. Inspection Personnel  R. McCarthy, J. Veitch, R. Dunnin, DEC.
                            R. Niles, Dept. of Water and Water Supply
   c. Persons Contacted (Including Address & Phone No.)  DAVO F. Bruno,
                                      Commissioners Dept. of Water and Water Supply, Albany,
                                      NY 12207 (518) 8661.
   d. History:
      Date Constructed     1928.
      Date(s) Reconstructed __________
      Designer             Robert F. Houston, Whitman Ragen & Smith
      Constructed By       __________
      Owner                City of Albany
Embankment

a. Characteristics

(1) Embankment Material

(2) Cutoff Type

(3) Impervious Core

(4) Internal Drainage System

(5) Miscellaneous

b. Crest

(1) Vertical Alignment

(2) Horizontal Alignment

(3) Surface Cracks

(4) Miscellaneous

c. Upstream Slope

(1) Slope (Estimate) (V:H)

(2) Undesirable Growth or Debris, Animal Burrows

(3) Sloughing, Subsidence or Depressions
(4) Slope Protection  

(5) Surface Cracks or Movement at Toe None

D. Downstream Slope

(1) Slope (Estimate - V:H) 1:2.5

(2) Undesirable Growth or Debris, Animal Burrows heavy brush & tree growth, some burrows.

(3) Sloughing, Subsidence or Depressions None

(4) Surface Cracks or Movement at Toe None

(5) Seepage None

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

(7) Condition Around Outlet Structure Good

(8) Seepage Beyond Toe in Spillway Channel

e. Abutments - Embankment Contact

Good
4. Erosion at Contact

(1) None

(2) Seepage Along Contact

None

3) Drainage System
   a. Description of System

None

b. Condition of System

---

c. Discharge from Drainage System

---

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

---

5) Reservoir
   a. Slopes  - stable
   b. Sedimentation  - normal
   c. Unusual Conditions Which Affect Dam  - none

6) Area Downstream of Dam
   a. Downstream Hazard (No. of Homes, Highways, etc.)  - under county limit, few South Western, water supply
   b. Seepage, Unusual Growth  - heavy growth of trees and brush, no signs of seepage
   c. Evidence of Movement Beyond Toe of Dam  - none
   d. Condition of Downstream Channel  - good, some debris

7) Spillway(s) (Including Discharge Conveyance Channel)
   a. General  - generally good, requires maintenance
      seepage under floor slab

   b. Condition of Service Spillway  - seepage through joint, construction joints, seepage carrying material from under outlet渠道, floor slab large cavities under slab
c. Condition of Auxiliary Spillway  


d. Condition of Discharge Conveyance Channel

Debris, voids under foundation must be repaired.


8) Reservoir Drain/Outlet

<table>
<thead>
<tr>
<th>Type: Pipe ✅</th>
<th>Conduit</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material: Concrete</td>
<td>Stone</td>
<td>Metal</td>
</tr>
<tr>
<td>Size: 42&quot; x 60&quot;</td>
<td>Length: 14 feet</td>
<td></td>
</tr>
</tbody>
</table>

Invert Elevations: Entrance 923.0 Exit 922.5

Physical Condition (Describe): Unobservable

| Material: good |
| Joints: good |
| Structural Integrity: good |
| Hydraulic Capability: 600 cfs |

Means of Control: Gate ✅ | Valve | Uncontrolled |

Operation: Operable ✅ | Inoperable | Other |

Present Condition (Describe): good.
9) Structural
   a. Concrete Surfaces  
      
      minor pitting
   
   b. Structural Cracking  
      
      seeping through horizontal construction joints
   
   c. Movement - Horizontal & Vertical Alignment (Settlement)  
      
      none
   
   d. Junctions with Abutments or Embankments  
      
      good
   
   e. Drains - Foundation, Joint, Face  
      
      good
   
   f. Water Passages, Conduits, Sluices  
      
      good shape
   
   g. Seepage or Leakage  
      
      through horizontal construction joints under floor slab
h. Joints - Construction, etc.

i. Foundation
   Good, need maintenance further investigation
   under spillway floor slab

j. Abutments
   Appear good - reopening of joints said

k. Control Gates
   None

l. Approach & Outlet Channels
   Outlet channel in need of
   maintenance: debris, voids, joints

m. Energy Dissipators (Plunge Pool, etc.)
   Mat rock & end of
   outlet channel

n. Intake Structures
   Poor shape, leaking badly around
   (east side of ris) all intakes

o. Stability
   Good

p. Miscellaneous
10) **Appurtenant Structures (Power House, Lock, Gatehouse, Other)**

a. **Description and Condition**

- Gate house and surrounding: 
  - Good, badly eroded under spillway slab, seepage through horizontal construction joints.
  - Intake on east side of Reservoir badly in need of maintenance, leaking around all intakes.

11) **Operation Procedures (Lake Level Regulation):**

- Not normally used or needed. Only regulation normally needed is low level outlet through spillway to lower reservoir level thereby reducing flooding to the low lying roadway across the reservoir.
APPENDIX C

HYDROLOGIC/HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS
### AREA-CAPACITY DATA:

<table>
<thead>
<tr>
<th></th>
<th>Elevation (ft.)</th>
<th>Surface Area (acres)</th>
<th>Storage Capacity (acre-ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Top of Dam</td>
<td>947</td>
<td>320</td>
</tr>
<tr>
<td>2</td>
<td>Design High Water (Max. Design Pool)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Auxiliary Spillway Crest</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Pool Level with Flashboards</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Service Spillway Crest</td>
<td>940</td>
<td>265</td>
</tr>
</tbody>
</table>

### DISCHARGES

<table>
<thead>
<tr>
<th></th>
<th>Volume (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Average Daily</td>
</tr>
<tr>
<td>2</td>
<td>Spillway @ Maximum High Water</td>
</tr>
<tr>
<td>3</td>
<td>Spillway @ Design High Water</td>
</tr>
<tr>
<td>4</td>
<td>Spillway @ Auxiliary Spillway Crest Elevation</td>
</tr>
<tr>
<td>5</td>
<td>Low Level Outlet</td>
</tr>
<tr>
<td>6</td>
<td>Total (of all facilities) @ Maximum High Water</td>
</tr>
<tr>
<td>7</td>
<td>Maximum Known Flood</td>
</tr>
<tr>
<td>8</td>
<td>At Time of Inspection</td>
</tr>
</tbody>
</table>

93-15-4(9/80)
<table>
<thead>
<tr>
<th>CREST:</th>
<th>ELEVATION: 947.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Homogeneous earth w/ concrete core wall</td>
</tr>
<tr>
<td>Width:</td>
<td>15</td>
</tr>
<tr>
<td>Length:</td>
<td>70.5</td>
</tr>
<tr>
<td>Spillover Location:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPILLWAY:</th>
<th>SERVICE</th>
<th>AUXILIARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation</td>
<td>940.</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Uncontrolled</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>99.</td>
<td></td>
</tr>
<tr>
<td>Type of Control</td>
<td>Uncontrolled</td>
<td></td>
</tr>
<tr>
<td>Controlled:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>(Flashboards; gate)</td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size/Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invert Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated Length of operating service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150' curve to right</td>
<td>Chute Length</td>
<td></td>
</tr>
<tr>
<td>2:1 slope</td>
<td>Height Between Spillway Crest &amp; Approach Channel Invert (Weir Flow)</td>
<td></td>
</tr>
</tbody>
</table>

93-15-4(9/80)
HYDROMETEOROLOGICAL GAGES:
Type: None on Basac Creek; lot Teulu8 Co. station in vicinity
Location: 
Records:
  Date - 69-78 annual peaks (Tenmile Creek)
  Max. Reading - 5400 cfs.

FLOOD WATER CONTROL SYSTEM:
Warning System: None

Method of Controlled Releases (mechanisms):
  Low level outlet through spillway
  24" line to Avenue Reservoir
DRAINAGE AREA: 19.96 mi²

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Rural - wooded and farmland

Terrain - Relief: Light to moderate

Surface - Soil: Loam sands gravel - glacial origin

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

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

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

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

Location:

Elevation:

Reservoir:

Length @ Maximum Pool 1.10 (Miles)

Length of Shoreline (@ Spillway Crest) 3.5 (Miles)
**Base Reservoir.**

Spillway L. 940.

L = 99 ft.

R = 7 ft.

Reservoir split by low embankment - due to large capacity, low embankment el. neglected.

**Dam Length @ 947.0 = 750 ft.**

### Spillway Capacity

<table>
<thead>
<tr>
<th>Cc.</th>
<th>C (ft)</th>
<th>A</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>940</td>
<td>2.4</td>
<td>2</td>
<td>952</td>
</tr>
<tr>
<td>924</td>
<td>3.6</td>
<td>4</td>
<td>2851</td>
</tr>
<tr>
<td>940</td>
<td>6</td>
<td>55 29</td>
<td></td>
</tr>
<tr>
<td>957</td>
<td>8.2</td>
<td>7</td>
<td>6967</td>
</tr>
<tr>
<td>948</td>
<td>8.3</td>
<td>8</td>
<td>5512</td>
</tr>
<tr>
<td>150</td>
<td>5.3</td>
<td>10</td>
<td>11,396</td>
</tr>
</tbody>
</table>

### Reservoir Capacity

<table>
<thead>
<tr>
<th>Cc.</th>
<th>Chart gals. x 10^6</th>
<th>Chart Max F.</th>
<th>Cc.</th>
<th>Capacity gals. x 10^6</th>
<th>Chart Max F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>922</td>
<td>194</td>
<td>194</td>
<td>52</td>
<td>188.2</td>
<td>577.6</td>
</tr>
<tr>
<td>844</td>
<td>21</td>
<td>5.4</td>
<td>52</td>
<td>235.7</td>
<td>577.6</td>
</tr>
<tr>
<td>825</td>
<td>9.5</td>
<td>31</td>
<td>52</td>
<td>289.2</td>
<td>577.6</td>
</tr>
<tr>
<td>6</td>
<td>19.4</td>
<td>59.5</td>
<td>35</td>
<td>343.7</td>
<td>687.5</td>
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<tr>
<td>926</td>
<td>35.1</td>
<td>55</td>
<td>35</td>
<td>413.4</td>
<td>1268.7</td>
</tr>
<tr>
<td>281</td>
<td>55.6</td>
<td>170.6</td>
<td>37</td>
<td>498.5</td>
<td>1268.7</td>
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<tr>
<td>31</td>
<td>50.3</td>
<td>55</td>
<td>53</td>
<td>560</td>
<td>1706.3</td>
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<tr>
<td>35</td>
<td>111.1</td>
<td>341.0</td>
<td>39</td>
<td>694.0</td>
<td>2198.6</td>
</tr>
<tr>
<td>40</td>
<td>146.7</td>
<td>40</td>
<td>40</td>
<td>716.4</td>
<td>2198.6</td>
</tr>
</tbody>
</table>
BASIC RESERVOIR

New channel: \( 20 \times \frac{5}{4000} = 0.05\ \text{mi} \)

\( s = \frac{1200 - 540}{70,000} = 0.015 \)

Old channel: \( S = \frac{20 - 10}{4000} = 0.018 \)

\( L_a = 115\ (21000 \times \frac{153}{2}) = 4.3\ \text{mi} \)

\( t_p = 4(L \times L_a)^{0.3} = 5.69\ \text{hrs}\), assuming \( C_t = 2.0 \)

\( t_r = \frac{t_p}{2.5} = 1.035\ \text{hrs} \)

\( T = t_p - 2.5t_r = 6.2\ \text{hrs} \)

\( C_p = 0.65 \)

DRAWN AREA: 19.46\ mi²

\( L_{FLP} = 19.5\ ” \)

<table>
<thead>
<tr>
<th>9</th>
<th>12</th>
<th>24</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>115</td>
<td>120</td>
<td>134</td>
</tr>
</tbody>
</table>

\( T = \frac{20 - 10}{4000\ \text{mi}} (x) (\frac{12,100}{12}) \)
**LOG-Pearson Type III Frequency Curves**

**Application**: Can calculate expected discharge at nominal pH of 6.62200. Corresponding mean on Weibull curve is 1.28E+05.

Below is a table showing the exceedance probability, systematic error, mean, expected value, and 95% confidence limit for 95% confidence interval:

<table>
<thead>
<tr>
<th>Exceedance (P)</th>
<th>Systematic Error (S)</th>
<th>Mean (M)</th>
<th>Expected Value (E)</th>
<th>95% Confidence Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.7749</td>
<td>253.4</td>
<td>551.0</td>
<td>551.0</td>
<td>243.6</td>
</tr>
<tr>
<td>0.9948</td>
<td>323.4</td>
<td>551.0</td>
<td>551.0</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.9900</td>
<td>359.8</td>
<td>551.0</td>
<td>551.0</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.9000</td>
<td>774.7</td>
<td>551.0</td>
<td>551.0</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.8000</td>
<td>1042.0</td>
<td>1044.0</td>
<td>1044.0</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.6000</td>
<td>1435.1</td>
<td>1664.1</td>
<td>1664.1</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.4000</td>
<td>2144.8</td>
<td>2144.8</td>
<td>2144.8</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.2000</td>
<td>2878.7</td>
<td>2878.7</td>
<td>2878.7</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.1000</td>
<td>3579.1</td>
<td>3579.1</td>
<td>3579.1</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.0500</td>
<td>3645.4</td>
<td>3645.4</td>
<td>3645.4</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.0250</td>
<td>3083.4</td>
<td>3083.4</td>
<td>3083.4</td>
<td>243.6, 700.3</td>
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<td>0.0050</td>
<td>1390.1</td>
<td>1390.1</td>
<td>1390.1</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.0000</td>
<td>8980.9</td>
<td>8980.9</td>
<td>8980.9</td>
<td>243.6, 700.3</td>
</tr>
<tr>
<td>0.0020</td>
<td>3645.4</td>
<td>3645.4</td>
<td>3645.4</td>
<td>243.6, 700.3</td>
</tr>
</tbody>
</table>

**NOTE**: Preliminary computations, use representative values for assessment, and interpolation.
STATION IUI: 61361570
NAME: TREMBLE CREEK AT OAK HILL NY

K & C LOG-PEARSON TYPE III CURVE FITTING

**** WARNING - SYS REC PERIOD OF HIGHEST SYSES FALLS BELOW NHY SPEC ****

HIGH OUTLIERS AND HISTORIC PEAKS TO BE TREATED AFTER TREATING LOW OUTLIERS.
1 LOW OUTLIERS BELOW NHY CRITERION OF 551.01 CFS. HAVE BEEN DROPPED.
HIGH OUTLIERS AND HISTORIC PEAKS ALRE HATEU.

ANNUAL FLOOD STATISTICS

<table>
<thead>
<tr>
<th></th>
<th>SYSTHMATIC</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>3.1352</td>
<td></td>
</tr>
<tr>
<td>STANDARD DEVIATION</td>
<td>0.2133</td>
<td></td>
</tr>
<tr>
<td>SKEW COEFFICIENTS STATION</td>
<td>-1.012</td>
<td></td>
</tr>
<tr>
<td>GENERALIZED NHY WEIGHTED</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>FLOOD BASE (CFS)</td>
<td>0.0</td>
<td>551.0</td>
</tr>
<tr>
<td>PREDICTED (BASE)</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>NUMBER OF PLANS</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>PERIOD (YEARS)</td>
<td>--</td>
<td>10</td>
</tr>
</tbody>
</table>

S = SYNTHETIC
* ADAPTED FOR FINAL COMPUTATIONS
<table>
<thead>
<tr>
<th>WATER YEAR</th>
<th>ANNUAL PEAK DISCH., CFS</th>
<th>DATE</th>
<th>CODES HIGHEST GAGE HEIGHT OF CODE ANNUAL MAX GAGE HT., FT</th>
<th>DATE</th>
<th>CODE</th>
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<tbody>
<tr>
<td>1960</td>
<td>2000</td>
<td>09-12-60</td>
<td>HP</td>
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<td></td>
</tr>
<tr>
<td>1969</td>
<td>1120</td>
<td>04-23-69</td>
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<tr>
<td>1970</td>
<td>1420</td>
<td>04-02-70</td>
<td>5.55</td>
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<tr>
<td>1971</td>
<td>520</td>
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<td>4.42</td>
<td></td>
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<tr>
<td>1972</td>
<td>1560</td>
<td>06-22-72</td>
<td>5.91</td>
<td></td>
<td></td>
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<tr>
<td>1973</td>
<td>2640</td>
<td>06-30-73</td>
<td>6.43</td>
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<tr>
<td>1974</td>
<td>2620</td>
<td>07-03-74</td>
<td>6.44</td>
<td></td>
<td></td>
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<tr>
<td>1975</td>
<td>1540</td>
<td>04-03-75</td>
<td>5.69</td>
<td></td>
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<tr>
<td>1976</td>
<td>1280</td>
<td>05-16-75</td>
<td>5.53</td>
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<tr>
<td>1977</td>
<td>2170</td>
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<td></td>
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<td>1978</td>
<td>51400</td>
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<td>7.98</td>
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**JAN SPECIFICATION**

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>IPT</th>
<th>IPT</th>
<th>Duration</th>
</tr>
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<tbody>
<tr>
<td>A1</td>
<td>N.Y.</td>
<td>C</td>
<td>C</td>
<td>0</td>
</tr>
<tr>
<td>A2</td>
<td>N.Y.</td>
<td>C</td>
<td>C</td>
<td>0</td>
</tr>
<tr>
<td>A3</td>
<td>N.Y.</td>
<td>C</td>
<td>C</td>
<td>0</td>
</tr>
</tbody>
</table>

**UTI=TAPE ANALYSES TO BE PERFORMED**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Lat:</th>
<th>Lon:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/75</td>
<td>12:00</td>
<td>40°00'</td>
<td>74°00'</td>
</tr>
</tbody>
</table>

**DATA COMPUTATION**

**JANPow**

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<thead>
<tr>
<th>Name</th>
<th>JANpow</th>
<th>JANpow</th>
<th>JANpow</th>
<th>JANpow</th>
<th>JANpow</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>152</td>
<td>78.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A2</td>
<td>78.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

**PDBF DATA**

<table>
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<tr>
<th>Name</th>
<th>PDBF</th>
<th>PDBF</th>
<th>PDBF</th>
<th>PDBF</th>
<th>PDBF</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>123</td>
<td>65</td>
<td>123</td>
<td>65</td>
<td>123</td>
</tr>
<tr>
<td>A2</td>
<td>65</td>
<td>123</td>
<td>65</td>
<td>123</td>
<td>65</td>
</tr>
<tr>
<td>A3</td>
<td>123</td>
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**UT AND JASON DATA**

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**REDUCTION DATA**

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<td>20</td>
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</tr>
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</table>

**Storage**

| Model | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|-------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|       |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Stage**

<p>| Model | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
|-------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|       |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |</p>
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<tr>
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<th>STATION</th>
<th>RATIO 1</th>
<th>RATIO 2</th>
<th>RATIO 3</th>
<th>RATIO 4</th>
<th>RATIO 5</th>
<th>RATIO 6</th>
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<tbody>
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<td>1</td>
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<td>Date</td>
<td>Time of Day</td>
<td>Duration</td>
<td>Flood Stage</td>
<td>Peak Flood</td>
<td>Time of Failure</td>
<td>Failure</td>
<td>Flood Stage</td>
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<td>------</td>
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<td>----------</td>
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<td>54°F</td>
</tr>
<tr>
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<td>01/02</td>
<td>06:00:00</td>
<td>12:00</td>
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<td>2,540</td>
<td>48.75</td>
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<td>54°F</td>
</tr>
<tr>
<td>3</td>
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<td>12:00:00</td>
<td>12:00</td>
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<td>2,540</td>
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<td>54°F</td>
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<td>24:00:00</td>
<td>12:00</td>
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<td>2,540</td>
<td>47.25</td>
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<td>54°F</td>
</tr>
<tr>
<td>6</td>
<td>01/06</td>
<td>00:00:00</td>
<td>12:00</td>
<td>54°F</td>
<td>2,540</td>
<td>47.25</td>
<td>C</td>
<td>54°F</td>
</tr>
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</table>
APPENDIX D

REFERENCES


2) U.S. Department of Commerce, Hydrometeorological Report No. 33, Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours; April 1956.


APPENDIX E

STABILITY ANALYSIS
**STABILITY ANALYSIS PROGRAM - WORK SHEET**

<table>
<thead>
<tr>
<th>INPUT ENTRY</th>
<th>ANALYSIS CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Weight of Dam (K/ft³)</td>
<td>0</td>
</tr>
<tr>
<td>Area of Segment No. 1 (ft²)</td>
<td>1 157.5</td>
</tr>
<tr>
<td>Distance from Center of Gravity of Segment No. 1 to Downstream Toe (ft)</td>
<td>2 183.3</td>
</tr>
<tr>
<td>Area of Segment No. 2 (ft²)</td>
<td>3 180</td>
</tr>
<tr>
<td>Distance from Center of Gravity of Segment No. 2 to Downstream Toe (ft)</td>
<td>4 18</td>
</tr>
<tr>
<td>Area of Segment No. 3 (ft²)</td>
<td>5 30</td>
</tr>
<tr>
<td>Distance from Center of Gravity of Segment No. 3 to Downstream Toe (ft)</td>
<td>6 18</td>
</tr>
<tr>
<td>Base Width of Dam (Total) (ft)</td>
<td>7 22</td>
</tr>
<tr>
<td>Height of Dam (ft)</td>
<td>8 22</td>
</tr>
<tr>
<td>Ice Loading (K/L ft.)</td>
<td>9 7.5</td>
</tr>
<tr>
<td>Coefficient of Sliding</td>
<td>10 0.7</td>
</tr>
<tr>
<td>Unit Weight of Soil (K/ft³) (deduct 18)</td>
<td>11 0.145</td>
</tr>
<tr>
<td>Active Soil Coefficient - Ka</td>
<td>12 0</td>
</tr>
<tr>
<td>Passive Soil Coefficient - Kp</td>
<td>13 3.0</td>
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<tr>
<td>Height of Water over Top of Dam or Spillway (ft)</td>
<td>14 0 7 9</td>
</tr>
<tr>
<td>Height of Soil for Active Pressure (ft)</td>
<td>15 0</td>
</tr>
<tr>
<td>Height of Soil for Passive Pressure (ft)</td>
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<td>Height of Water in Tailrace Channel (ft)</td>
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<tr>
<td>Weight of Water (K/ft³)</td>
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<tr>
<td>Area of Segment No. 4 (ft²)</td>
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<tr>
<td>Distance from Center of Gravity of Segment No. 4 to Downstream Toe (ft)</td>
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</tr>
<tr>
<td>Height of Ice Load or Active Water (ft) (does not include 14)</td>
<td>46 22.5 20 22.5 22.5 22.5</td>
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<tr>
<td>Seismic Coefficient (g)</td>
<td>50 0.0 0.0 0.0 0.0 0.1</td>
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<tr>
<td>RESULTS OF ANALYSIS</td>
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<tr>
<td>Factor of Safety vs. Overturning</td>
<td>2.23 1.77 1.62 1.51 2.13</td>
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<tr>
<td>Distance From Toe to Resultant</td>
<td>11.2 8.4 8.3 7.5 10.7</td>
</tr>
<tr>
<td>Factor of Safety vs. Sliding</td>
<td>6.89 5.51 4.20 3.78 4.76</td>
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</table>
### BASIC CREEK DAM

#### STABILITY ANALYSIS

#### SPILLWAY SECTION

<table>
<thead>
<tr>
<th>Case I Normal Loading</th>
<th>Case IV PMF</th>
<th>Case V Seismic Loading</th>
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<tbody>
<tr>
<td>(a) 2.225835492</td>
<td>(a) 1.50810784</td>
<td>(a) 2.12542104</td>
</tr>
<tr>
<td>(b) 11.17449641</td>
<td>(b) 7.452907129</td>
<td>(b) 10.74384121</td>
</tr>
<tr>
<td>(c) 6.394259159</td>
<td>(c) 3.776464725</td>
<td>(c) 4.76035147</td>
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<table>
<thead>
<tr>
<th>Case II Ice Loading</th>
<th>Case III 1/2 PMF</th>
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</thead>
<tbody>
<tr>
<td>(a) 1.767039825</td>
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</tr>
<tr>
<td>(b) 8.425600601</td>
<td>(b) 8.327707921</td>
</tr>
<tr>
<td>(c) 5.510323682</td>
<td>(c) 4.199170472</td>
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</table>

**NOTE:**
- (a) is the factor of safety for overturning;
- (b) is the location of the resultant from the toe;
- (c) is the factor of safety for sliding.
OF ALBANY, NEW YORK
OF WATER SUPPLY
SECTION NO. 1  
CONTRACT NO. 1

BASIC CREEK DAM

February 25, 1928

<table>
<thead>
<tr>
<th>CONTRACT DRAWINGS IN THIS SET:</th>
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<tbody>
<tr>
<td>NAME</td>
</tr>
<tr>
<td>Landfill plans</td>
</tr>
<tr>
<td>Repairs to existing work</td>
</tr>
<tr>
<td>Detailed plans</td>
</tr>
<tr>
<td>Water main plans</td>
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<tr>
<td>Outside view plans</td>
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<tr>
<td>Intake plans</td>
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</table>
# C CREEK DAM

**SECTION NO.:**

**CONTRACT NO.:**

- **FLYWEIGHTS**

---

**FACT DRAWINGS IN THIS SET:**

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<tr>
<td>2</td>
<td>6 7 8 9 10</td>
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<tr>
<td>3</td>
<td>11 12 13 14</td>
</tr>
<tr>
<td>4</td>
<td>15 16 17 18</td>
</tr>
<tr>
<td>5</td>
<td>19 20 21 22</td>
</tr>
<tr>
<td>6</td>
<td>23 24 25 26</td>
</tr>
</tbody>
</table>

**TOTAL:** 26
DRAINAGE AREA - 18.37 SQ.

Reservoir Flow Line - Elev.
Top of Embankment - Elev.

Reservoir Area at Flow Line = 7
At face between Tunnel Ivect - Elev. 9500 ft. Flow Line 5

Overall Length of Dam 9 ft.
Length of Embankment 30 ft.
Maximum Height above Ground 9 ft.
Length of Spillway = 100 ft.
Maximum Height above Natural Rock = 34 ft.

Spillway Capacity/Water Surface at Elev. 445.5 Ft. Depth = 414.6

CAPACITY OF SPILLWAY WASTE CHAMBERS
At 2 Ft. Depth = Approx. 26
4 Ft. Depth = 87
6 Ft. Depth = 182
8 Ft. Depth = 377

DESIGN OF SPILLWAY SECTORS
Masonry = 145 #/Cu. Ft.
Uplift = 33% of Full Head at Decreasing Uniformly to Zero

Reservoir designed as a detention reservoir for ice pressure, but spillway section will use 5000 ft. Lin. Ft. and keep resultant within limits within specified.
Sq. Mks.
942.00
948.50

A = 265 Acres
A = 314,160 - 672,000,000 GALLONS

200 Ft.
W = 762 Ft.
11 Surface = 81 Ft.
100 Ft.
15 Surface = 17.50 Ft.

1.44 C.F.S. = 253 C.F.S. per Sq. Mks.

CHANNEL (N = 0.025)

260 C.F.S.

870 "
1810 "
3770 "

SECTION

11 Ft.

D at Heel
Zero at Toe

DIR only with no allowance
will withstand top thrust
within middle 3rd.
RESEVOIR DESIGNED AS A DETENTION RESERVOIR ON
THE 100-YEAR PROCEDURE, BUT SPILLWAY SECTION WILL
BE DESIGNED TO KEEP RESEVOIR WITHIN
THE WATER EQUILIBRIUM.

DESIGN DATA
BASIC CREEK DAM AND RESEVOIR
SECTION 0

AT HEEL

300 AT TOE

OR ONLY WITH NO ALLOWANCE

TO STAND TOP THRUST

IN MIDDLE 3RD.
CITY OF ALBANY, NEW BOARD OF WATER S
SECTION NO. 1
CONTRACT NO. 1
BASIC CREEK DAM
TOPOGRAPHY OF RES.
AND DESIGN D2

MAP OF RESERVOIR AREA
CITY OF ALBANY, NEW YORK
BOARD OF WATER SUPPLY.

SECTION NO. 1
CONTRACT NO. 1

BASIC CREEK DAM.

TOPOGRAPHY OF RESERVOIR
AND DESIGN DATA.
CITY OF ALBANY, NEW \nBOARD OF WATER SU \nSECTION NO. 1 \nCONTRACT NO. 1 \nBASIC CREEK DA \nLOCATION PLAN AND ELE
City of Albany, New York.

Tand of Water Supply.

Section No. 1

Contract No. 1

Basic Creek Dam

Foundation Plan and Elevation

Prepared By Smith

Drafted By

February 7, 1928.
Top of Cornwall and Crest of Embankment, Elev. 946.50

no lateral construction joints in Cornwall to be staggered.

of horizontal joint to be 60 ft.

-profile

Scales: 1

Flow Line, Elev. 930.0

Slope Paving to be grouted.

Approximate Ext. Rock Line. Finished Grade.

Elev. 930.0

Elev. 330.0

Existing Ground Line.
Cut-off trench leaves rock, the "1/2" to be reinforced on each face for 8 ft., with 3" x 4" G. both ways.

The elevations of bottom of spillway, bottom of spillway and corewall cut-offs, bottom of abutments, and top of corewall cut-off are on the material encountered and are to be determined as the work progresses.

**Note:**
Corewall to be reinforced with 3/4" rods, 12" C. bollwys; vertical rods to extend 3'0" into cut-off wall.
Consolidated Embankment

Batten 1/4 in to 1 ft
Typical horizontal or vertical construction joint.

Note:
Top of Embankment and Downstream Face to be covered with Top Soil and sown with Grass Seed.

Section at Station 5+20
For Typical Section of Abutment Walls, see Section E-E, Sheet No. 5
Concrete in Abutment Walls-Item 14.
Note:
Corewall to be reinforced with 3/4" rods, 12" bothways; vertical rods to extend 3'0" into cut-off wall.

Section at Station 5+00

Section at Station 8+60

Typical Sections of Earth Dam
Scale: 1" = 1 ft.

City of Albany, New York
Board of Water Supply

Section No. 1
Contract No. 1

Basic Creek Dam
Earth Dam and Abutment

Whitman, Requardt and Smith
Engineers

Scale as shown

Sheet No. 4
Note:
Top of Embankment and Downstream Face to be covered with Top Soil and sow with Grass Seed.

Section at Station 5+20

Section at Station 8+60

TYPICAL SECTIONS OF EARTH DAM
Scale: 1 in. = 1 ft.

OF ALBANY, NEW YORK
END OF WATER SUPPLY

SECTION NO. 1
CONTRACT NO. 1

BASIC CREEK DAM

DAM AND ABUTMENT DETAILS

E. J. Bartlett & Smith

Robert F. Norton
Consulting Engineer
February 1959
Plan of Gate Chamber and Sluiceway

Scale: ½ in. = 1 Ft.

West Abutment Wall

Concrete Walk

Concrete Balcany

Detail showing method of bending or wall reinforcement into Abutment Walls

Gate House

Concrete Walk - 4 4'

Top of Earth Dam - 4 E elevation - 546.50
GATE CHAMBER AND SLUICEWAY
SECTION A-A
Scale: 1" = 1 ft.

Typical Section
Scale: 1" = 1 ft.
Gate Chamber
Section B-B
Scale: 1 in. = 1 ft.

6" Circular Bronze Mounted Sluice Gate, with Flanged End bolted to 12" length of 6" Flanged C.I. Pipe
PLAN OF GATE CHAMBER AND SLUICEWAY
Scale: 1 in = 1 Ft.
Gate Chamber and Sluiceway
Section A-A
Scale: 1 in. = 1 ft.

Spillway
Item 14
Elev. 340.0

Trash Rack composed of 2 x 1/2 bars at top and bottom and 1 square bars spaced 6" and 16" C. Bars to be welded at points of contact. Rack to be galvanized.

Elev. 323.0
Elev. 323.0

Side Elevation of Gate Chamber
Section D-D
Scale: 1/2 in. = 1 ft.
ALBANY, NEW YORK WATER SUPPLY

SECTION NO. 1

CONTRACT NO. 1

CREEK DAM AND GATE CHAMBER DETAILS

SMITH

February 25, 1925.

Sheet No. 5.
Foot Bridge

as detailed below
LONGITUDINAL SECTION OF FOOT BRIDGE
Scale ¼"=1'-0"

SECTION A
Scale: ¼"=1'-0"

PLAN OF APPROACH TO FOOT BRIDGE
Scale: ¼"=1'-0"

Top of Dam-Elev 946.50
Slope of Embankment
Tread 20°
Riser 8°

Earth Embankment

Elev 946.50
Plan of Approach to Foot Bridge
Scale 1/2"=1'-0"

Typical Section of Flagstone Steps
Scale: 1/2"=1'-0"

Elevation of Flagstone Steps
Scale: 1/2"=1'-0"

CITY OF ALBANY, NEW YORK
BOARD OF WATER SUPPLY

SECTION NO 1
CONTRACT NO 1

BASIC CREEK DAM:
GATE HOUSE AND FOOT BRIDGE
DETAILS

WHITFORD, MEADOWS, AND SMITH
ENGINEERS

C. C. COHEN, P.E.

February 1921