

AD-A074 579

NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON

F/G 13/2

NATIONAL DAM SAFETY PROGRAM. WHITE MEADOW LAKE DAM (NJ-00340), --ETC(U)

AUG 79 R J MCDERMOTT, J E GRIBBIN

DACW61-79-C-0011

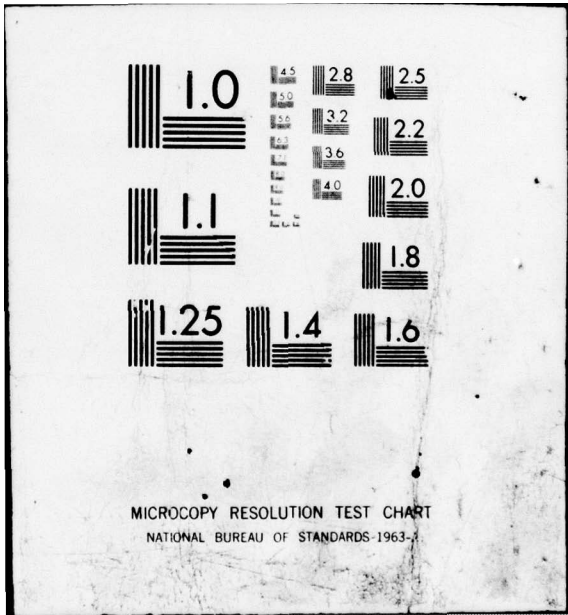
NL

UNCLASSIFIED

1 OF 2

AD
A074 579





Approved for public release;
distribution unlimited

PASSAIC RIVER BASIN
WHITE MEADOW BROOK,
MORRIS COUNTY
NEW JERSEY

LEVEL ^H

WHITE MEADOW LAKE DAM

NJ 00340

**PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**



**DDC
RECEIVED
OCT 3 1979
A**

DDC FILE COPY

DEPARTMENT OF THE ARMY

Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

79 10 02 035

August, 1979

DA 074579

| REPORT DOCUMENTATION PAGE | | READ INSTRUCTIONS BEFORE COMPLETING FORM |
|--|-----------------------|---|
| 1. REPORT NUMBER NI00340 | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle) Phase I Inspection Report National Dam Safety Program White Meadow Lake Dam Morris County, N.J. | | 5. TYPE OF REPORT & PERIOD COVERED 9 FINAL report |
| 7. AUTHOR(s) McDermott, Richard J. / McDermott Gribbin, John E. / Gribbin | | 6. PERFORMING ORG. REPORT NUMBER |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS Storch Engineers 110 Ridgedale Ave. Florham Park, NJ 07932 | | 8. CONTRACT OR GRANT NUMBER(s) 15 DACW61-79-C-0011 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Engineer District, Philadelphia Custom House, 2d & Chestnut Streets Philadelphia, Pennsylvania 19106 | | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 12 129 |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) | | 12. REPORT DATE 1 August 1979 |
| | | 13. NUMBER OF PAGES 75 |
| | | 15. SECURITY CLASS. (of this report) Unclassified |
| | | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE |
| 16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited. | | |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) 6 National Dam Safety Program. White Meadow Lake Dam (NJ-00340), Passaic River Basin, White Meadow Brook, Morris County, New Jersey. Phase I Inspection Report. | | |
| 18. SUPPLEMENTARY NOTES Copies are obtainable from National Technical Information Service, Springfield, Virginia, 22151. | | |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) White Meadow Lake Dam, N.J. Visual inspection Spillways National Dam Inspection Act Report Seepage Structural Analysis | | |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report. | | |

410 891

NOTICE

**THIS DOCUMENT HAS BEEN REPRODUCED
FROM THE BEST COPY FURNISHED US BY
THE SPONSORING AGENCY. ALTHOUGH IT
IS RECOGNIZED THAT CERTAIN PORTIONS
ARE ILLEGIBLE, IT IS BEING RELEASED
IN THE INTEREST OF MAKING AVAILABLE
AS MUCH INFORMATION AS POSSIBLE.**



IN REPLY REFER TO
NAPEN-D

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

| | |
|--------------------|-------------------------------------|
| Accession For | |
| NTIS GRA&I | <input checked="" type="checkbox"/> |
| DDC TAB | <input type="checkbox"/> |
| Unannounced | <input type="checkbox"/> |
| Justification | |
| By _____ | |
| Distribution/ | |
| Availability Codes | |
| Dist. | Avail and/or special |
| A | |

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

25 SEP 1979

Dear Governor Byrne:

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

Based on visual inspection, available records, calculations and past operational performance, White Meadow Lake Dam, a high hazard potential structure, is judged to be in fair overall condition. The spillway is considered seriously inadequate since eleven percent of the Probable Maximum Flood (PMF) would overtop the dam. The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard of loss of life downstream from the dam. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway and to prevent overtopping should be initiated within calendar year 1980. In the interim, a detailed emergency operation plan and warning system, should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

NAPEN-D

Honorable Brendan T. Byrne

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to determine the dam's embankment and foundation condition and structural stability. This should include test borings to determine material properties relative to stability and seepage and installation of piezometers to facilitate seepage studies. Any remedial measures found necessary should be initiated within calendar year 1980.

c. Within six months from the date of approval of this report, the following remedial measures should be undertaken by the owner:

(1) All trees on the embankment should be cut off at ground level.

(2) The submerged portions of the spillway and inaccessible portions of the outlet pipe should be inspected for distress and deterioration with the lake drawn down. Concrete surfaces in the spillway should be sand blasted and coated with an epoxy sealant after all cracks are thoroughly inspected and pressure grouted. The outlet pipe should be renovated if necessary.

(3) A formal program of annual inspection and maintenance for the dam should be initiated. The inspection should be performed by a professional engineer experienced in the design and construction of dams and the observations and measurements should be recorded on standardized check-list forms. Inspection check-lists and complete records of maintenance should be included in a permanent file.

Repairs should be performed as required and the following maintenance should be performed annually: remove trees from the embankment, fill and stabilize eroded area, clear debris from the spillway and the downstream channel. The current practice of periodically lowering the lake for maintenance purposes should be continued and at least once every five years the lake should be completely drained to permit a thorough inspection and repair of the dam appurtenances.

d. Within 12 months from the date of approval of this report, a detailed topographic survey of the dam and area around the dam, based on USGS datum, should be undertaken by a qualified licensed land surveyor or professional engineer. The survey map should become part of the permanent record.

NAPEN-D

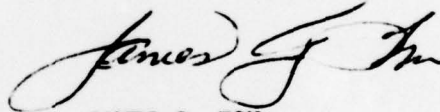
Honorable Brendan T. Byrne

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

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

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

Sincerely,



JAMES G. TON
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

Copies furnished:

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

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

WHITE MEADOW LAKE DAM (NJ00340)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 30 April 1979 by Storch Engineers under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

White Meadow Lake Dam, a high hazard potential structure, is judged to be in fair overall condition. The spillway is considered seriously inadequate since eleven percent of the Probable Maximum Flood (PMF) would overtop the dam. The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE classification applied for a structural deficiency. It does mean, however, that based on an initial screening, and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard of loss of life downstream from the dam. To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures, and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway and to prevent overtopping should be initiated within calendar year 1980. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

b. Within six months from the date of approval of this report, engineering studies and analyses should be performed to determine the dam's embankment and foundation condition and structural stability. This should include test borings to determine material properties relative to stability and seepage and installation of piezometers to facilitate seepage studies. Any remedial measures found necessary should be initiated within calendar year 1980.

c. Within six months from the date of approval of this report, the following remedial measures should be undertaken by the owner:

(1) All trees on the embankment should be cut off at ground level.

(2) The submerged portions of the spillway and inaccessible portions of the outlet pipe should be inspected for distress and deterioration with the lake drawn down. Concrete surfaces in the spillway should be sand blasted and coated with an epoxy sealant after all cracks are thoroughly inspected and pressure grouted. The outlet pipe should be renovated if necessary.

(3) A formal program of annual inspection and maintenance for the dam should be initiated. The inspection should be performed by a professional engineer experienced in the design and construction of dams and the observations and measurements should be recorded on standardized check-list forms. Inspection check-lists and complete records of maintenance should be included in a permanent file.

Repairs should be performed as required and the following maintenance should be performed annually: remove trees from the embankment, fill and stabilize eroded area, clear debris from the spillway and the downstream channel. The current practice of periodically lowering the lake for maintenance purposes should be continued and at least once every five years the lake should be completely drained to permit a thorough inspection and repair of the dam appurtenances.

d. Within 12 months from the date of approval of this report, a detailed topographic survey of the dam and area around the dam, based on USGS datum, should be undertaken by a qualified licensed land surveyor or professional engineer. The survey map should become part of the permanent record.

APPROVED: 

JAMES G. TON

Colonel, Corps of Engineers
District Engineer

DATE: 22 Sep 1979



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

IN REPLY REFER TO
NAPEN-D

13 SEP 1979

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

Dear Governor Byrne:

This is in reference to our ongoing National Program for Inspection of Non-Federal Dams within the State of New Jersey. White Meadow Lake Dam (Federal I.D. No. NJ00340), a high hazard potential structure has recently been inspected. The dam is owned by the White Meadow Lake Property Owner's Association and is located on White Meadow Brook in Rockaway Township.

Using Corps of Engineers' screening criteria, it has been determined that the dam's spillway is seriously inadequate since approximately 11 percent of the Probable Maximum Flood would overtop the dam. The seriously inadequate spillway is assessed as an UNSAFE, non-emergency condition, until more detailed studies prove otherwise, or corrective measures are completed. The classification of UNSAFE applied to a dam because of a seriously inadequate spillway is not meant to indicate the same degree of emergency as would be associated with an UNSAFE unclassification applied for a structural deficiency. It does mean, however, that based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard potential to loss of life downstream from the dam. As a result of this UNSAFE determination, it is recommended that the dam's owner take the following measures within 30 days of the date of this letter:

a. Engage the services of a qualified professional consultant to more accurately determine the spillway adequacy by using more detailed and sophisticated hydrologic and hydraulic analyses, and to recommend any remedial measures required to prevent overtopping of the dam.

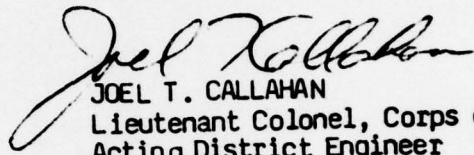
NAPEN-D

Honorable Brendan T. Byrne

b. In the interim, a detailed emergency operation plan and downstream warning system should be developed. Also, round-the-clock surveillance should be provided during periods of unusually heavy precipitation.

A final report on this Phase I Inspection will be forwarded to you within two months.

Sincerely,



Handwritten signature of Joel T. Callahan in cursive script.

JOEL T. CALLAHAN
Lieutenant Colonel, Corps of Engineers
Acting District Engineer

Copies Furnished:

Dirk C. Hofman, Actg. Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

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

UNSAFE DAM
NATIONAL PROGRAM OF INSPECTION OF DAMS

a. NAME: White Meadow Lake Dam b. ID NO.: NJ00340 c. LOCATION State: New Jersey County: Morris
d. HEIGHT: 15 feet. e. MAXIMUM IMPOUNDMENT CAPACITY: 417 ac ft.
River or Stream: White Meadow Brook.
Nearest D/S City or Town: Middletown.

f. TYPE: Earthfill. g. OWNER: White Meadow Lake Property Owners Association.

h. DATE GOVERNOR NOTIFIED OF UNSAFE CONDITIONS: 13 Sep 79. i. CONDITION OF DAM RESULTING IN UNSAFE ASSESSMENT Preliminary report calculations indicate 11% of PMF would overtop the dam.

l. URGENCY CATEGORY: UNSAFE, Non-Emergency.

m. EMERGENCY ACTIONS TAKEN: Gov. notified of this condition by District Engineer's letter of 13 Sep 79.

h. REMEDIAL ACTIONS TAKEN: N.J.D.E.P. will notify dam's owner upon receipt of our letter.

o. REMARKS: Final report, to be issued within six weeks, will have WHITE cover.

j. DESCRIPTION OF DANGER INVOLVED: Overtopping and failure of the dam would significantly increase hazard potential to loss of life and property downstream of dam.

k. RECOMMENDATIONS GIVEN TO GOVERNOR: Within 30 days of date of District Engineer letter the owner do the following:
a. Engage the services of a qualified professional consultant to more accurately determine the spillway adequacy by using more detailed and sophisticated hydrologic and hydraulic analyses, and to recommend any remedial measures required to prevent overtopping of the dam.

b. In the interim, a detailed emergency operation plan and downstream warning system should be developed. Also, around-the-clock surveillance should be provided during periods of unusually heavy precipitation.

W. H. Zink
W. H. ZINK, Coordinator
Dam Inspection Program
U.S.A.E.D., Philadelphia

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: White Meadow Lake Dam, NJ00340
State Located: New Jersey
County Located: Morris
Drainage Basin: Passaic River
Stream: White Meadow Brook
Date of Inspection: April 30, 1979

Assessment of General Condition of Dam

Based on visual inspection, past operational performance and Phase I engineering analyses, White Meadow Lake Dam is assessed as being in fair overall condition.

Hydraulic and hydrologic analyses indicate that the spillway is seriously inadequate. The discharge capacity of the spillway is not sufficient to pass the designated spillway design flood (SDF) without an overtopping of the dam, and dam failure would significantly increase the hazard downstream over that which would exist without dam failure. (The SDF for White Meadow Lake Dam is equal to one-half the probable maximum flood.) The spillway can pass approximately 10 percent of the probable maximum flood, or 20 percent of the SDF. Therefore, the owner should engage a professional engineer experienced in the design and construction of dams soon to perform accurate hydraulic and hydrologic analyses relating to spillway capacity. Based on the findings of the analyses, remedial measures should be undertaken to prevent overtopping of the dam resulting from a storm equivalent to the SDF. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

In addition, a professional engineer experienced in the design and construction of dams should be engaged soon to investigate the structural stability of the dam. The investigation should include all measures necessary, such as: dye testing, borings and corings, to assess the structural stability of the dam.

It is further recommended that the following remedial measures be undertaken by the owner in the near future.

- 1) All trees on the embankment should be cut off at ground level.
- 2) The submerged portions of the spillway and inaccessible portions of the outlet pipe should be inspected for distress and deterioration with the lake drawn down. Concrete surfaces in the spillway should be sand blasted and coated with an epoxy sealant after all cracks are thoroughly inspected and pressure grouted. The outlet pipe should be renovated if necessary.

The owner of the dam should initiate, in the near future, a program of periodic inspection and maintenance, the complete records of which to be kept on file and made available to the public. A visual inspection of the dam and appurtenances by a professional engineer experienced in the design and construction of dams should be made annually and reported on a standardized check-list form. Repairs should be made as required and the following maintenance should be performed annually: remove trees from the embankment, fill and sod any eroded surfaces of the embankment and clear the downstream channel. The current practice of periodically lowering the lake for maintenance purposes should be continued and at least once every five years the lake should be lowered completely to permit a thorough inspection and repair of the dam and appurtenances.

A detailed topographic survey of the dam and area around the dam, based on USGS datum, should be undertaken by a qualified licensed land surveyor

or professional engineer in the near future. The survey map should become part of the permanent record mentioned above.

Richard J. McDermott
Richard J. McDermott, P.E.

John E. Gribbin
John E. Gribbin, P.E.



OVERVIEW - WHITE MEADOW LAKE DAM

30 APRIL 1979

TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| ASSESSMENT OF GENERAL CONDITION OF DAM | i |
| OVERVIEW PHOTO | iv |
| TABLE OF CONTENTS | v |
| PREFACE | vii |
| SECTION 1 - PROJECT INFORMATION | 1 |
| 1.1 General | |
| 1.2 Description of Project | |
| 1.3 Pertinent Data | |
| SECTION 2 - ENGINEERING DATA | 9 |
| 2.1 Design | |
| 2.2 Construction | |
| 2.3 Operation | |
| 2.4 Evaluation | |
| SECTION 3 - VISUAL INSPECTION | 11 |
| 3.1 Findings | |
| SECTION 4 - OPERATIONAL PROCEDURES | 15 |
| 4.1 Procedures | |
| 4.2 Maintenance of Dam | |
| 4.3 Maintenance of Operating Facilities | |
| 4.4 Description of Warning System | |
| 4.5 Evaluation of Operational Adequacy | |

TABLE OF CONTENTS (cont.)

| | <u>Page</u> |
|--|-------------|
| SECTION 5 - HYDRAULIC/HYDROLOGIC | 17 |
| 5.1 Evaluation of Features | |
| SECTION 6 - STRUCTURAL STABILITY | 20 |
| 6.1 Evaluation of Structural Stability | |
| SECTION 7 - ASSESSMENT AND RECOMMENDATIONS | 22 |
| 7.1 Dam Assessment | |
| 7.2 Recommendations | |
| | |
| PLATES | |
| 1 KEY MAP | |
| 2 VICINITY MAP | |
| 3 SOIL MAP | |
| 4 GENERAL PLAN | |
| 5 SPILLWAY SECTION | |
| 6 DAM SECTIONS | |
| 7 PHOTO LOCATION PLAN | |
| | |
| APPENDICES | |
| 1 Check List - Visual Inspection | |
| Check List - Engineering Data | |
| 2 Photographs | |
| 3 Engineering Data | |
| 4 Hydrologic Computations | |
| 5 Bibliography | |

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. 30214. 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. It is important to note that the condition of 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 the 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. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

WHITE MEADOW LAKE DAM, I.D.NJ00340

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 Division of Water Resources of the New Jersey Department of Environmental Protection (NJDEP) in cooperation with the Philadelphia District of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the State of New Jersey. Storck Engineers has been retained by the NJDEP to inspect and report on a selected group of these dams. The NJDEP is under agreement with the Philadelphia District of the Corps of Engineers.

b. Purpose of Inspection

The visual inspection of White Meadow Lake Dam was made on April 30, 1979. The purpose of the inspection was to make a general assessment of the structural integrity and operational adequacy of the dam structure and its appurtenances.

1.2 Description of Project

a. Description of Dam and Appurtenances

White Meadow Lake Dam is an earthfill dam with a straight concrete weir spillway and a gated 36-inch corrugated metal pipe outlet works.

Flow from the spillway enters an earth discharge channel which, in turn, discharges over a secondary concrete weir 80 feet downstream from the dam. Discharge from the secondary weir flows under White Meadow Road into White Meadow Brook and eventually enters the Rockaway River.

The earthfill embankment is about 300 feet long and extends north to south. The embankment crest is about 20 feet wide and the entire length is paved with a concrete and asphalt pedestrian walkway. Both upstream and downstream faces are vertical along the entire dam length. The upstream face is protected by a concrete wall and the downstream face by a stone masonry wall. Along the south section of the downstream face, the stone masonry is constructed in two tiers.

The spillway consists of a free-overflow concrete broad-crested weir, 29 feet in length. The width of the spillway is equal to the width of the dam. A timber pedestrian walkway and diving platform span the full length of the spillway.

The crest of dam, at elevation 753.7, is 1.0 foot above the crest of the spillway. The maximum height of the dam is 15 feet.

The outlet works consists of a 36-inch corrugated metal pipe transversely penetrating the dam at the spillway. A lift gate, with operating stem projecting through the crest of the spillway, controls flow through the pipe.

b. Location

White Meadow Lake Dam is located in the Township of Rockaway, Morris County, New Jersey. Constructed across White Meadow Brook, the dam impounds White Meadow Lake which is the recreation focus of a residential development. The dam is readily accessible by local roads.

c. Size and Hazard Classification

Size and Hazard Classification criteria presented in "Recommended Guidelines for Safety Inspection of Dams", published by the U.S. Army Corps of Engineers are as follows:

SIZE CLASSIFICATION

| <u>Category</u> | <u>Impoundment</u> | |
|-----------------|--------------------------|---------------------|
| | <u>Storage (Ac-ft)</u> | <u>Height (Ft)</u> |
| Small | < 1000 and \geq 50 | < 40 and \geq 25 |
| Intermediate | \geq 1000 and < 50,000 | \geq 40 and < 100 |
| Large | \geq 50,000 | \geq 100 |

HAZARD POTENTIAL CLASSIFICATION

| <u>Category</u> | <u>Loss of Life</u> (Extent of Development) | <u>Economic Loss</u> (Extent of Development) |
|-----------------|---|---|
| Low | None expected (no permanent structures for human habitation) | Minimal (Undeveloped to occasional structures or agriculture) |
| Significant | Few (No urban developments and no more than a small number of inhabitable structures) | Appreciable (Notable agriculture, industry or structures) |
| High | More than few | Excessive (Extensive community, industry or agriculture) |

The following characteristics relating to size and downstream hazard for White Meadow Lake Dam have been determined for this Phase I assessment:

Storage: 417 Acre-feet

Height: 15 feet

Potential Loss of Life:

Several dwellings are located in the downstream SDF flood plain. Within 1300 feet of the dam, approximately 5 of these dwellings would be inundated to heights of 0.5 feet to 2 feet above the first floor as a result of dam failure due to overtopping resulting in the potential loss of more than a few lives. A dam breach analysis is contained in Appendix 4.

Potential Economic Loss:

Damage could be sustained by at least two secondary road bridges and several dwellings downstream of the dam as a result of dam failure due to overtopping.

Therefore, White Meadow Lake Dam is classified as "Small" size and "High" hazard potential.

d. Ownership

White Meadow Lake Dam is owned and operated by White Meadow Lake Property Owners' Association, 100 White Meadow Road, Rockaway, N.J. 07866.

e. Purpose of Dam

The purpose of the dam is the impoundment of a lake used for recreation.

f. Design and Construction History

White Meadow Lake Dam reportedly was constructed prior to 1945. In that year, the developer of the area bought the lake and surrounding properties from Warren Foundry & Pipe Corp. No plans for the construction of the dam could be obtained for this report.

g. Normal Operational Procedures

The dam and appurtenances are operated and maintained by White Meadow Lake Property Owners' Association. There is no regular schedule of maintenance or operation. Repairs are made on an "as needed" basis.

Reportedly, the outlet works gate is generally not opened during times of high lake levels. The outlet works is used to drain the lake for maintenance of lake related structures.

1.3 Pertinent Data

a. Drainage Area 2.9 square miles

b. Discharge at Damsite

| | |
|---------------------------------|-----------|
| Maximum flood at damsite | Unknown |
| Outlet works at pool elevation | 78 c.f.s. |
| Spillway capacity at top of dam | 76 c.f.s. |

c. Elevation (Feet above MSL)

| | |
|---------------------------------|-------------------|
| Top of dam | 753.7 |
| Maximum pool-design surcharge | 755.1 |
| Recreation pool | 753.0 |
| Spillway crest | 752.7 |
| Stream bed at centerline of dam | 738.6 |
| Maximum tailwater | 744.0 (Estimated) |

d. Reservoir

| | |
|------------------------------|------------------------|
| Length of maximum pool | 5,800 feet (Estimated) |
| Length of recreation pool | 5,400 feet (Scaled) |
| Length of flood control pool | N.A. |

e. Storage (Acre-feet)

| | |
|--------------------|---------------|
| Recreation pool | 320 acre-feet |
| Flood control pool | N.A. |
| Maximum pool | 618 acre-feet |
| Top of dam | 417 acre-feet |

f. Reservoir Surface (Acres)

| | |
|--------------------|-----------------------|
| Top of dam | 142 acres (Estimated) |
| Maximum pool | 151 acres (Estimated) |
| Flood control pool | N.A. |
| Recreation pool | 137 acres |
| Spillway crest | 137 acres |

g. Dam

| | |
|-----------------------|-----------|
| Type | Earthfill |
| Length | 300 feet |
| Height | 15 feet |
| Sideslopes - Upstream | Vertical |
| - Downstream | Vertical |
| Zoning | Unknown |
| Impervious core | Unknown |
| Cutoff | Unknown |
| Grout curtain | Unknown |

h. Diversion and Regulating Tunnel N.A.

i. Spillway

| | |
|-------------------|---|
| Type | Uncontrolled concrete weir |
| Length of weir | 29 feet |
| Crest elevation | 752.7 |
| Gates | N.A. |
| Approach channel | N.A. |
| Discharge channel | Earth channel with concrete weir at downstream end. |

j. Regulating Outlet

36-inch gated CMP outlet

SECTION 2: ENGINEERING DATA

2.1 Design

No calculations, reports nor plans pertaining to the design of the dam are available.

2.2 Construction

No data nor reports pertaining to the construction of the dam are available.

2.3 Operation

No records of operation of the lake or dam and no inspection reports subsequent to construction are available.

2.4 Evaluation

a. Availability

No engineering information is available for the subject dam.

b. Adequacy

Available engineering data pertaining to White Meadow Lake Dam is not adequate to be of significant assistance to the performance of a Phase I evaluation. A list of absent information is included in paragraph 7.1.b.

c. **Validity**

The validity of engineering data cannot be assessed due to the absence of data.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

The inspection of White Meadow Lake Dam took place on April 30, 1979 by members of the staff of Storch Engineers. A copy of the visual inspection check list is contained in Appendix 1. The following procedures were employed for the inspection:

- 1) The embankment of the dam, appurtenant structures and adjacent areas were examined.
- 2) Areas of suspected seepage were noted and located.
- 3) The embankment and appurtenant structures were measured and key elevations determined with the use of a surveyor's level.
- 4) The embankment and appurtenant structures and adjacent areas were photographed.

b. Dam

The entire length of the dam crest is paved for pedestrian use. The upstream portion of the pavement is concrete while the remaining portion is bituminous. The concrete pavement generally is in adequate condition with some settlement noted. Also, some bituminous patches were observed on the concrete pavement. The bituminous pavement generally is in adequate condition with several longitudinal cracks approximately 2 feet from the downstream edge and one small area of failure in the north section resembling a "pothole."

The concrete wall comprising the upstream face of embankment is in generally adequate condition. The south section of wall appears to have a "shotcrete" surface. The construction joint between the wall and the concrete pavement is in generally satisfactory condition with some separation noted along the south section.

The stone wall along the north section of the downstream face of embankment is in generally satisfactory condition. The south half of this wall is stone masonry while the north half consists of ungrouted stone. The stone masonry wall along the south section is constructed in two tiers. A portion of the lower tier is tilted in the downstream direction.

A few trees and shrubs are located along the downstream side of the crest of dam and along the lower tier of the stone masonry wall on the downstream face of dam.

Two seepage zones were observed at the toe of the south section of the dam. One zone, located about 36 feet south of the spillway, was manifest as a wet area while the other zone, located about 2 feet south of the spillway, was in the form of discharge issuing through rocks comprising the toe of dam.

Beyond the south end of the dam is a beach area and at the north end of the dam a club house owned by White Meadow Lake Property Owners' Association is located. The lawn is less than 0.5 foot above water level and is protected from inundation by a concrete wall 1 foot in height above lake level. Several wet lawn areas were observed behind the concrete wall indicating that it provides inadequate protection against inundation.

The generalized soil description of the dam site consists of alluvial soil composed of stratified materials deposited by streams overlying glacial terminal moraine. The moraine consists of an unassorted and heterogeneous mixture of materials, ranging in size from clay to boulders, deposited at the outer edge of the ice sheet during the Wisconsin stage of continental glaciation. The glacial terminal moraine overlies Pre-Cambrian bedrock consisting of Losee gneiss.

c. Appurtenant Structures

The spillway crest appears to be in fair condition. Some debris has accumulated on the weir crest and the concrete surface appeared to be eroded with aggregate exposed. A crack 1/8 inch wide and running in a diagonal direction was observed at the south spillway training wall. A group of large rocks at the downstream side of the spillway serve as an energy dissipator.

The lift gate could not be observed at the time of inspection and the corrugated metal outlet pipe appeared to be in deteriorated condition. A flow of approximately 1 to 2 c.f.s. was observed discharging from the pipe. The gate operating mechanism appeared to be in adequate condition.

d. Reservoir Area

White Meadow Lake has a maximum length of about 1 mile with widths varying from 600 to 1200 feet. The entire shore line is developed and three swim areas are located around the lake. The slope of the shore line varies from 5 to 20 percent. Most of the watershed area is wooded with residential development.

e. Downstream Channel

Discharge from White Meadow Lake Dam enters White Meadow Brook and then Beaver Brook. A bridge supporting White Meadow Road, a secondary road, is located about 100 feet downstream from the dam. Beyond the bridge the channel is aligned through residential and industrial areas for approximately 1.2 miles and before joining Beaver Brook. White Meadow Brook has a well defined channel with thickly wooded banks and no significant obstructions in the vicinity of the dam.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

The water level in White Meadow Lake is naturally controlled by overflow over the spillway. Operation of the dam consists of lowering the lake about 3 feet each year for lake related maintenance. Reportedly, the time required to lower the lake 3 feet is approximately 2 weeks.

4.2 Maintenance of Dam

Maintenance of the dam is performed on an "as needed" basis. Reportedly, six years ago, the concrete wall on the upstream side of the south section of the dam was repaired by the application of shotcrete. The pavement on the crest of dam is patched as the need arises. A full-time maintenance crew is employed by White Meadow Lake Property Owners' Association whose duties include dam maintenance.

4.3 Maintenance of Operating Facilities

Maintenance of operating facilities is performed on an "as needed" basis. Reportedly, the most recent maintenance was performed about 4 or 5 years ago when the gate lift channels were replaced.

4.4 Description of Warning System

Reportedly, the maintenance crew monitors the water level in the lake during storms and informal communication is occasionally established with officials in the Township of Denville, downstream from the dam.

4.5 Evaluation of Operational Adequacy

Operation of the dam has not been successful in that the dam reportedly has been overtopped about twice a year. Reportedly, no damage was done by the overtoppings.

Maintenance documentation could not be obtained for this report. However, reportedly, the maintenance crew reports to the Board members of the Property Owners' Association. The following areas of maintenance appear to be insufficient:

1. Trees allowed to grow on embankment.
2. Erosion of soil under asphalt pavement near downstream side of crest not repaired.
3. Damaged fence on dam not repaired.
4. Debris allowed to accumulate on spillway crest.
5. Settled concrete pavement on upstream side of dam crest not repaired.
6. Deteriorated outlet pipe not renovated.
7. Leakage through outlet works not corrected.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design Data

The quantity of storm water runoff that the spillway should be able to pass without an overtopping of the dam is based on the size and hazard classification of the dam. This runoff, called the Spillway Design Flood (SDF), is described in terms of frequency or probable maximum flood (PMF) depending on the extent of the dam's size and potential hazard. According to the "Recommended Guidelines for Safety Inspection of Dams," published by the U.S. Army Corps of Engineers, the SDF for White Meadow Lake Dam falls in a range of 1/2 PMF to PMF. In this case, the low end of the range, 1/2 PMF, is chosen since the factors used to select size and hazard classification are on the low side of their respective ranges.

The SDF hydrograph for White Meadow Lake was derived by the combination of the outflow hydrograph for Mt. Hope Lake Dam and the inflow hydrograph from the drainage area between Mt. Hope Lake and White Meadow Lake.

Computations of the inflow hydrograph for both sub-areas were performed by the HEC-1-DB computer program using the SCS triangular method with curvilinear transformation. The combination of the two hydrographs, routing through White Meadow Lake Dam and downstream routing were also included in the program (See printout in Appendix 4). The calculated SDF peak inflow for White Meadow Lake Dam is 2757 c.f.s.

Discharge capacity for White Meadow Lake Dam was computed by considering free discharge over the crest of spillway which was assumed to have the characteristics of a broad crested weir.

In routing the SDF through White Meadow Lake it was found that the dam would be overtopped to a height of 1.4 feet for a duration of 10.4 hours in a non-breach condition. A dam breach analysis was then performed using a trapezoidal breach of 120 feet bottom length. The peak breach outflow was computed to be 7323 c.f.s. The breach analysis indicates that the maximum water levels at two downstream locations 350 feet and 1150 feet downstream are approximately 738.5 and 721.8, respectively. These elevations represent inundation of up to 2 feet above first floor levels of about 5 downstream dwellings. A breach analysis is located in Appendix 4.

Since a storm equivalent to the SDF would result in overtopping and failure of the dam, and outflow during failure would significantly increase the downstream hazard over that which would exist without dam failure, the spillway is assessed as being seriously inadequate in accordance with criteria established by the U.S. Army Corps of Engineers.

b. Experience Data

The dam reportedly overtops about twice a year due to high water level combined with wave action.

c. Visual observation

No conclusive evidence was found at the time of inspection that would indicate that the dam had been eroded by overtopping.

d. Overtopping Potential

As indicated in paragraph 5.1.a, a storm of magnitude equivalent to the SDF would cause overtopping of the dam to a height of 1.4 feet. Computations indicate that the dam can pass approximately 10 percent of the PMF (or 20 percent of the SDF) without being overtopped.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

The embankment appeared, at the time of inspection, to be generally outwardly stable. However, some indications of possible distress were noted. Included among these are cracks in the bituminous pavement on the crest, a small section of pavement failure, tilting of the downstream stone masonry wall and two zones of seepage. An accurate determination of the severity of the observed seepage and other indications of possible distress cannot be made without further investigation beyond the scope of a Phase I inspection.

b. Design and Construction Data

Analysis of structural stability and construction data for the embankment and spillway structure are not available.

c. Operating Records

No operating records are available for the dam.

d. Post Construction Changes

No records of any post construction changes are available.

e. Seismic Stability

White Meadow Lake Dam is located in Seismic Zone 1 as defined in "Recommended Guideline for Safety Inspection of Dams,"

which is a zone of very low seismic activity. Experience indicates that dams in Seismic Zone 1 will have adequate stability under seismic loading conditions if stable under static loading conditions. White Meadow Lake Dam appeared, at the time of inspection, to be generally outwardly stable.

SECTION 7: ASSESSMENT AND RECOMMENDATIONS

7.1 Dam Assessment

a. Safety

Based on hydraulic and hydrologic analyses outlined in Section 5 and Appendix 4, the spillway of White Meadow Lake Dam is assessed as being seriously inadequate. The spillway is not able to pass one-half of the PMF and dam failure would significantly increase the downstream hazard over that which would exist without dam failure.

The dam appeared to be generally outwardly stable based on field inspection. The observed seepage, cracks and other signs of possible distress are not considered to be an immediate indication of instability. However, sufficient data is not available to allow a complete assessment of the present structural condition of the dam and appurtenances.

b. Adequacy of Information

Information sources for this study include 1) field investigations, 2) USGS quadrangle sheet, 3) aerial photography from Morris County, 4) consultation with maintenance and operation personnel for the Property Owners' Association and 5) topographic map from Township of Rockaway.

The information obtained is sufficient to allow a Phase I assessment as outlined in "Recommended Guidelines for Safety Inspection of Dams."

Some data not available are as follows:

1. Stream and lake gaging records.
2. Description of dam embankment structures and material.
3. Construction records.
4. Post construction records.
5. Description of foundation materials.
6. Construction and as-built drawings.

c. Necessity for Additional Data/Evaluation

Additional evaluation is considered necessary in order to assess the structural stability of the dam. The evaluation should be based on investigations as outlined in paragraph 7.2.c.

7.2 Recommendations

a. Remedial Measures

Based on hydraulic and hydrologic analyses outlined in paragraph 5.1.a, the spillway is considered to be seriously inadequate.

Therefore, it is recommended that a professional engineer experienced in the design and construction of dams be engaged soon to perform more accurate hydraulic and hydrologic analyses relating to the spillway capacity. The analyses should more accurately determine runoff characteristics of the watershed and should refine the discharge capacity of the spillway and the downstream channel capacity.

Based on the findings of these analyses, the dam and spillway should be modified to prevent overtopping of the dam resulting from a storm equivalent to the SDF. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

It is further recommended that the following remedial measures be undertaken by the owner in the near future.

- 1) All trees on the embankment should be cut off at ground level.
- 2) The submerged portions of the spillway and inaccessible portions of the outlet pipe should be inspected for distress and deterioration with the lake drawn down. Concrete surfaces in the spillway should be sand blasted and coated with an epoxy sealant after all cracks are thoroughly inspected and pressure grouted. The outlet pipe should be renovated if necessary.

b. Maintenance

The owner of the dam should initiate in the near future a formal program of annual inspection and maintenance for the dam. The inspection should be performed by a professional engineer experienced in the design and construction of dams and the observations and measurements should be recorded on standardized check list forms. Inspection check-lists and complete records of maintenance should be included in a permanent file available for public inspection.

Repairs should be performed as required and the following maintenance should be performed annually: remove trees from

the embankment, fill and stabilize eroded area, clear debris from the spillway and the downstream channel. The current practice of periodically lowering the lake for maintenance purposes should be continued and at least once every five years the lake should be completely drained to permit a thorough inspection and repair of the dam and appurtenances.

c. Additional Studies

A professional engineer experienced in the design and construction of dams should be engaged soon to investigate the structural stability of the dam. The investigation should include all measures necessary, such as: dye testing, borings and corings, to assess the structural stability of the dam.

A detailed topographic survey of the dam and area around the dam, based on USGS datum, should be undertaken by a qualified licensed land surveyor or professional engineer in the near future. The survey map should become part of the permanent record mentioned in paragraph 7.2.b.

PLATES

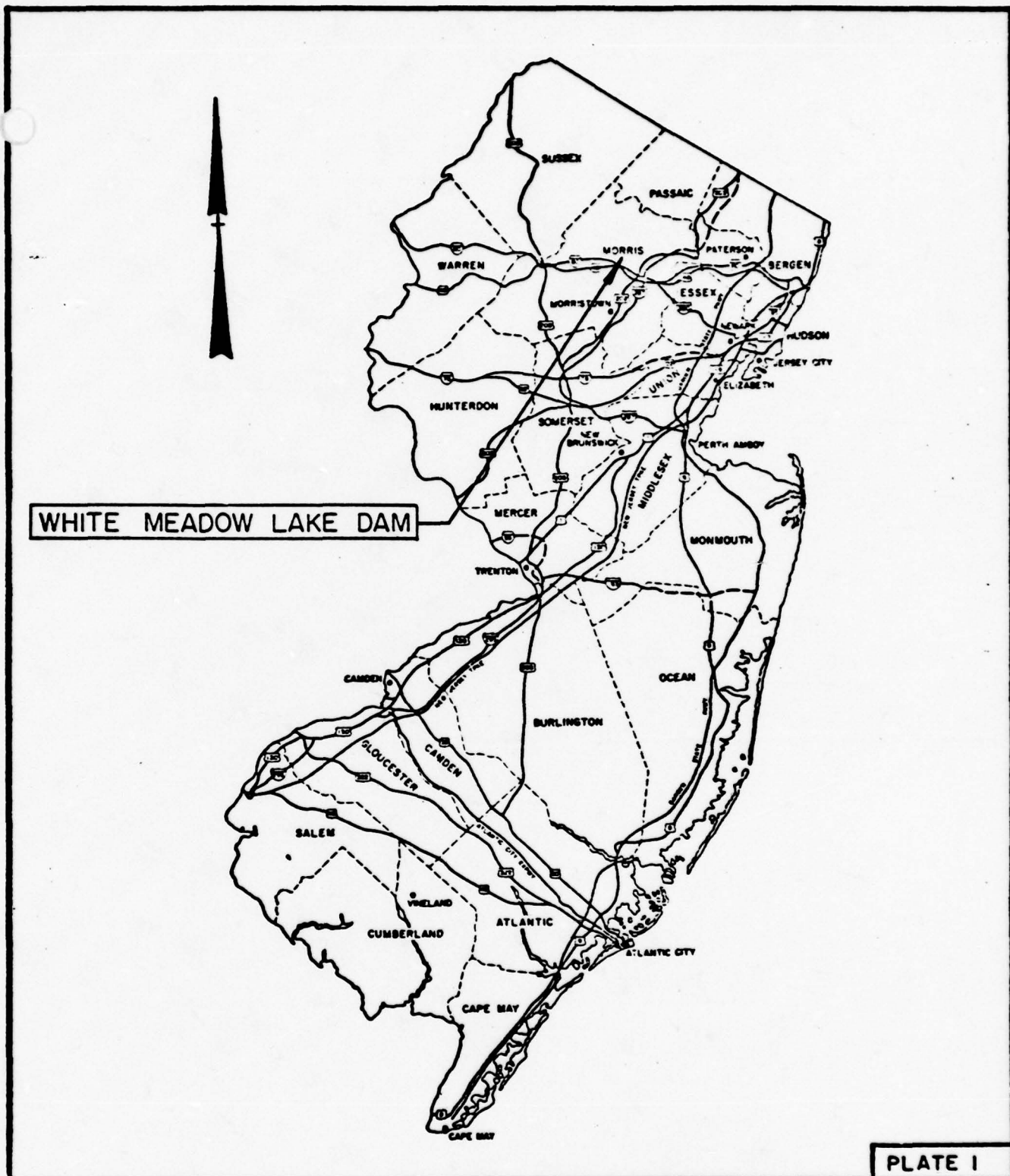
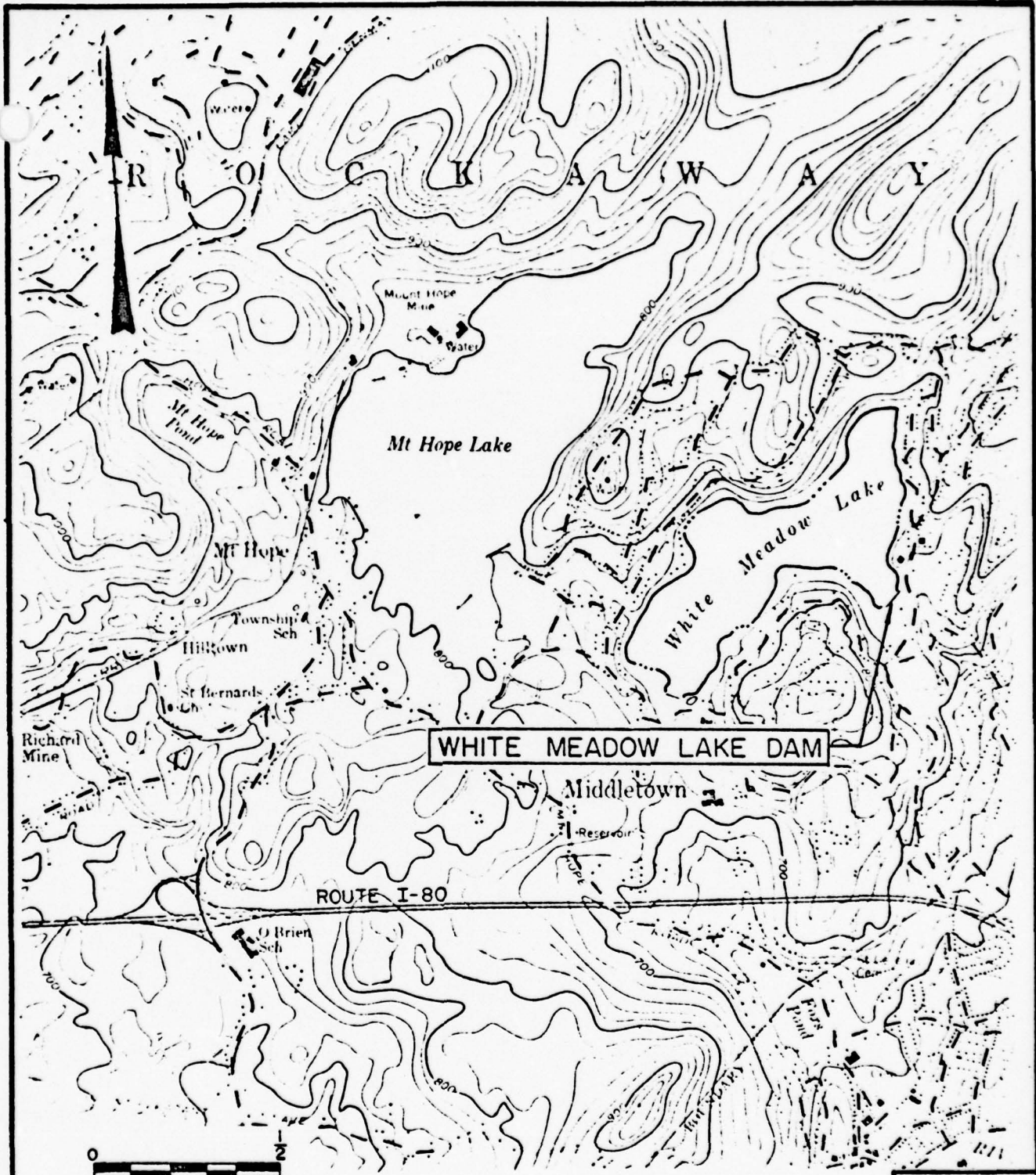


PLATE I

| | | |
|--|---|--|
| <p>STORCH ENGINEERS FLORHAM PARK, NEW JERSEY</p> | <p>INSPECTION AND EVALUATION OF DAMS KEY MAP WHITE MEADOW LAKE DAM</p> | |
| <p>DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY</p> | <p>I.D. N.J. 00340</p> | <p>SCALE: NONE DATE: JULY, 1979</p> |



WHITE MEADOW LAKE DAM

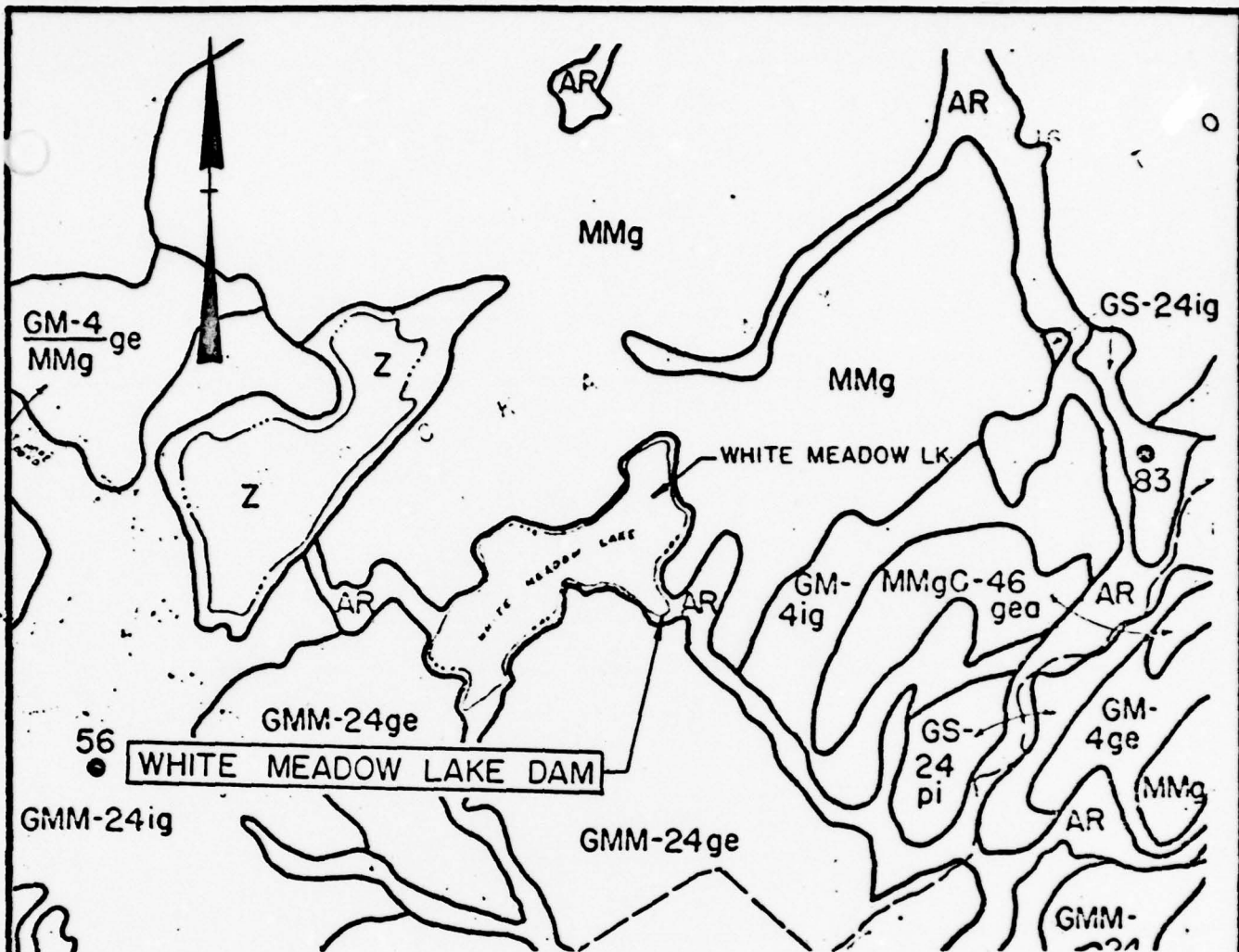
PLATE 2

STORCH ENGINEERS
 FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
 N.J. DEPT. OF ENVIR. PROTECTION
 TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
VICINITY MAP
 WHITE MEADOW LAKE DAM

| | |
|---------------|------------------|
| I.D. NJ 00340 | SCALE: AS SHOWN |
| | DATE: JUNE, 1979 |



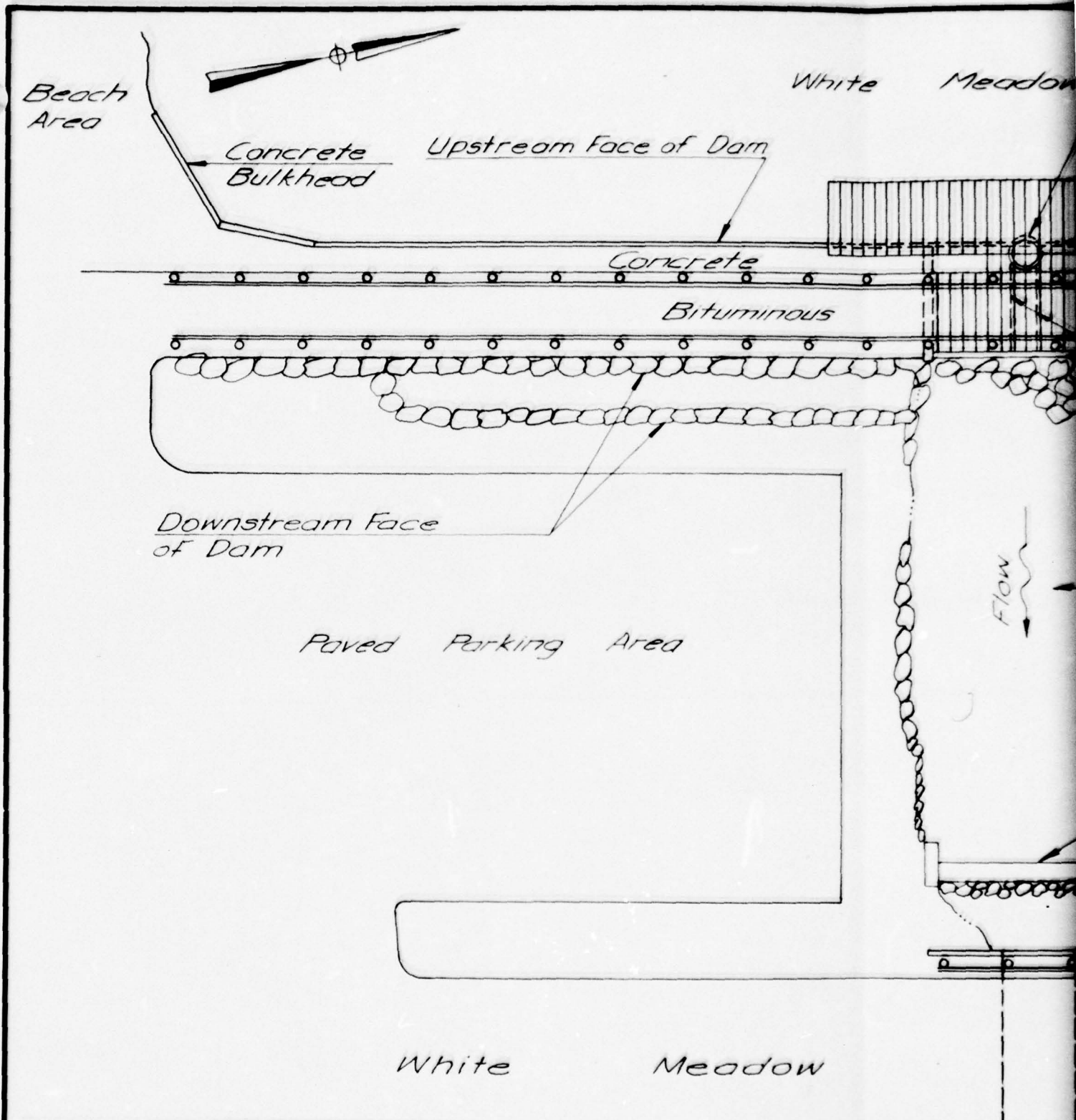
Legend

- AR Recent alluvium composed of stratified materials deposited by streams.
- GMM-24 Glacial terminal moraine. Unassorted and heterogeneous mixture of materials, ranging in size from clay to boulders, deposited at the outer edge of the ice sheet during the Wisconsin stage of continental glaciation.
- MMg Gneissic bedrock at or near the surface. (Losee Gneiss, Pre-Cambrian formation.)

Note: Information taken from Rutgers University Soil Survey of New Jersey, Report No. 9, Morris County, and Geologic Map of New Jersey prepared by Lewis and Kummel.

PLATE 3

| | | |
|---|---|------------------|
| STORCH ENGINEERS FLORHAM PARK, NEW JERSEY | INSPECTION AND EVALUATION OF DAMS SOIL MAP | |
| | WHITE MEADOW LAKE DAM | |
| DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY | I.D. NJ00340 | SCALE: NONE |
| | | DATE: JUNE, 1979 |



Note: Information taken from field inspection April 30, 1979.

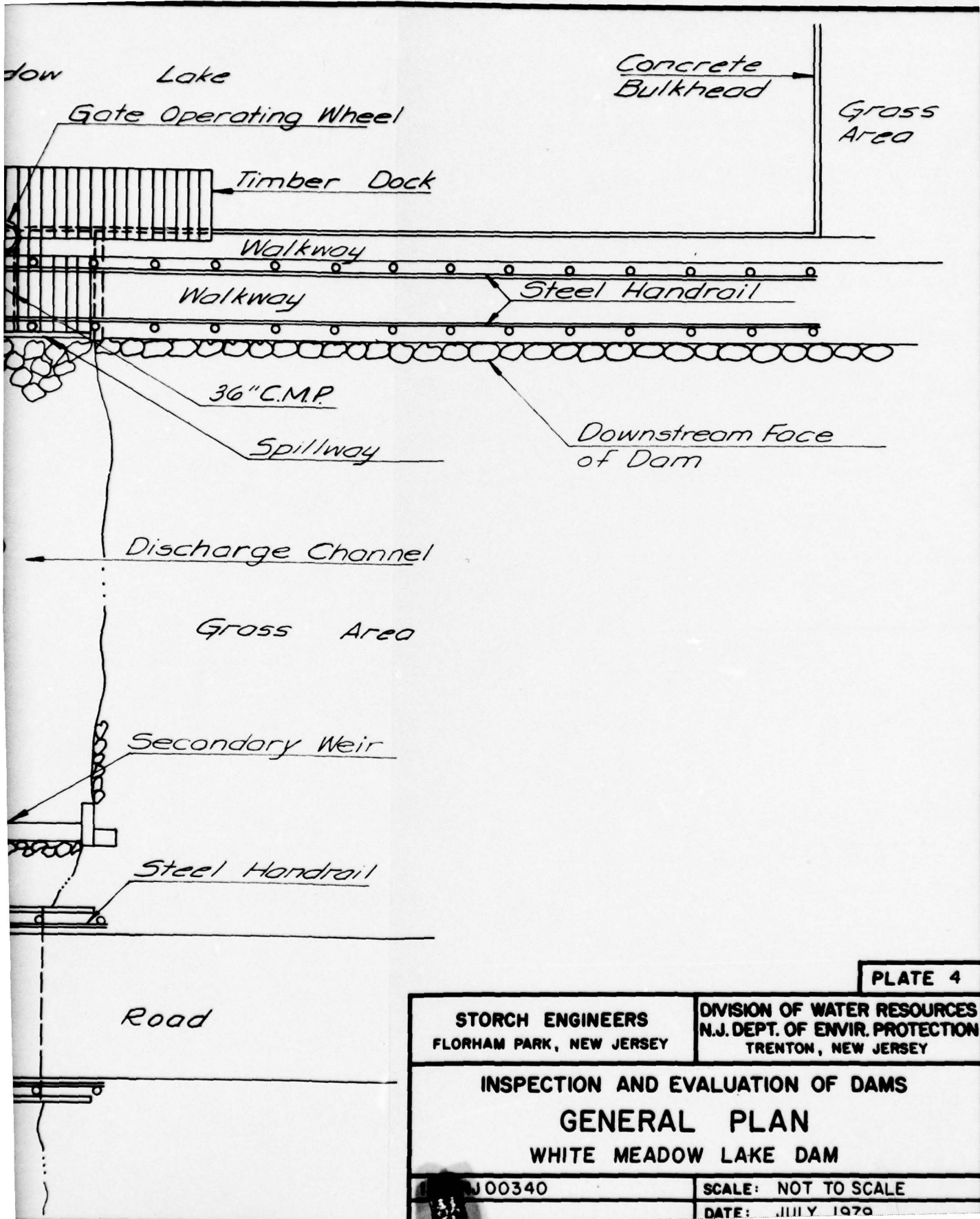


PLATE 4

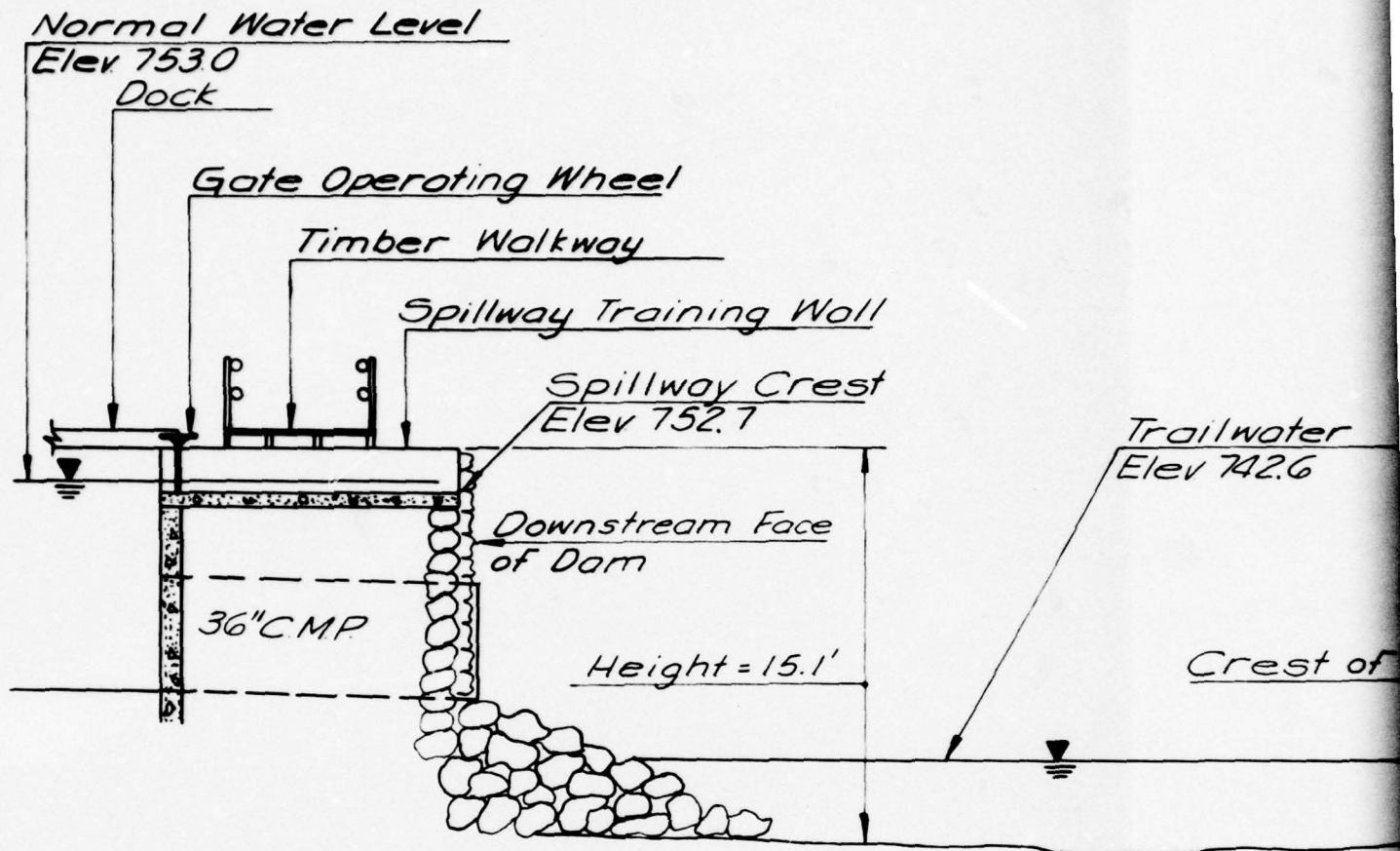
STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS
GENERAL PLAN
WHITE MEADOW LAKE DAM

W00340

SCALE: NOT TO SCALE
DATE: JULY 1979



Note: Information taken from field inspection April 30, 1979.

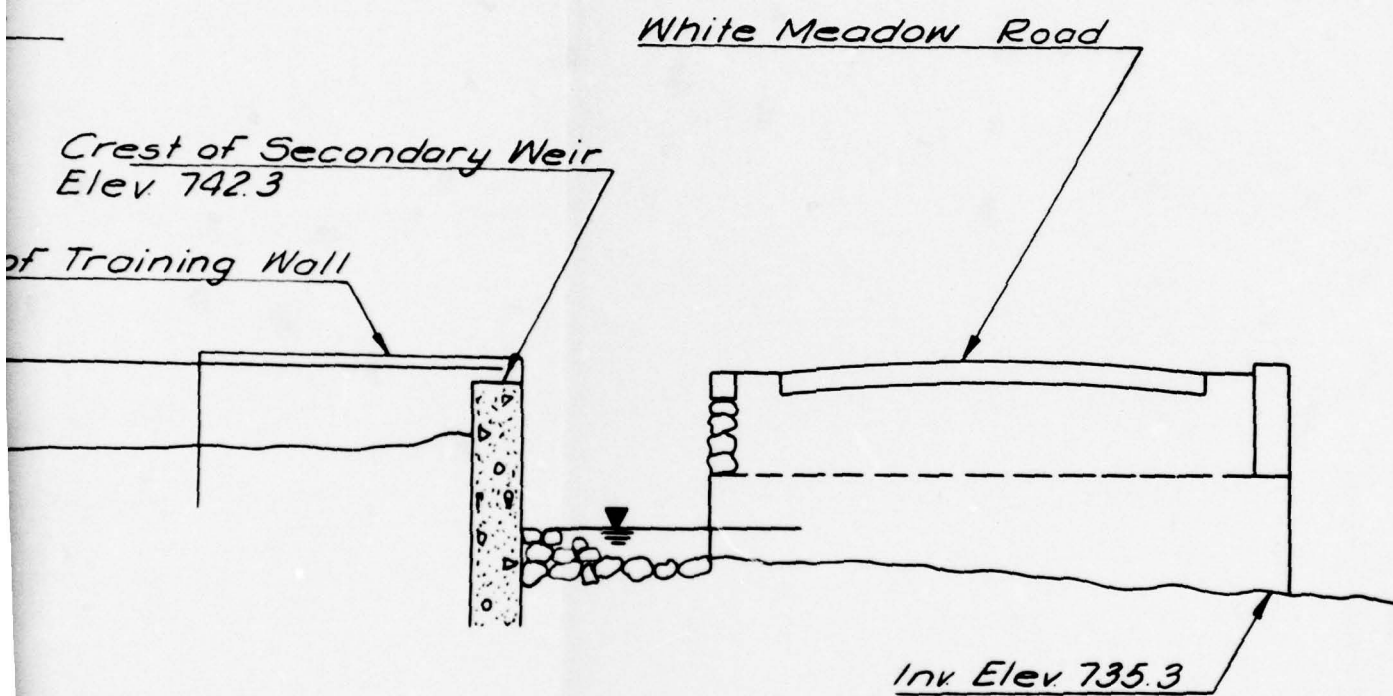


PLATE 5

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS

SPILLWAY SECTION
WHITE MEADOW LAKE DAM

I.D. NJ00340

SCALE: NOT TO SCALE

DATE: JULY, 1979

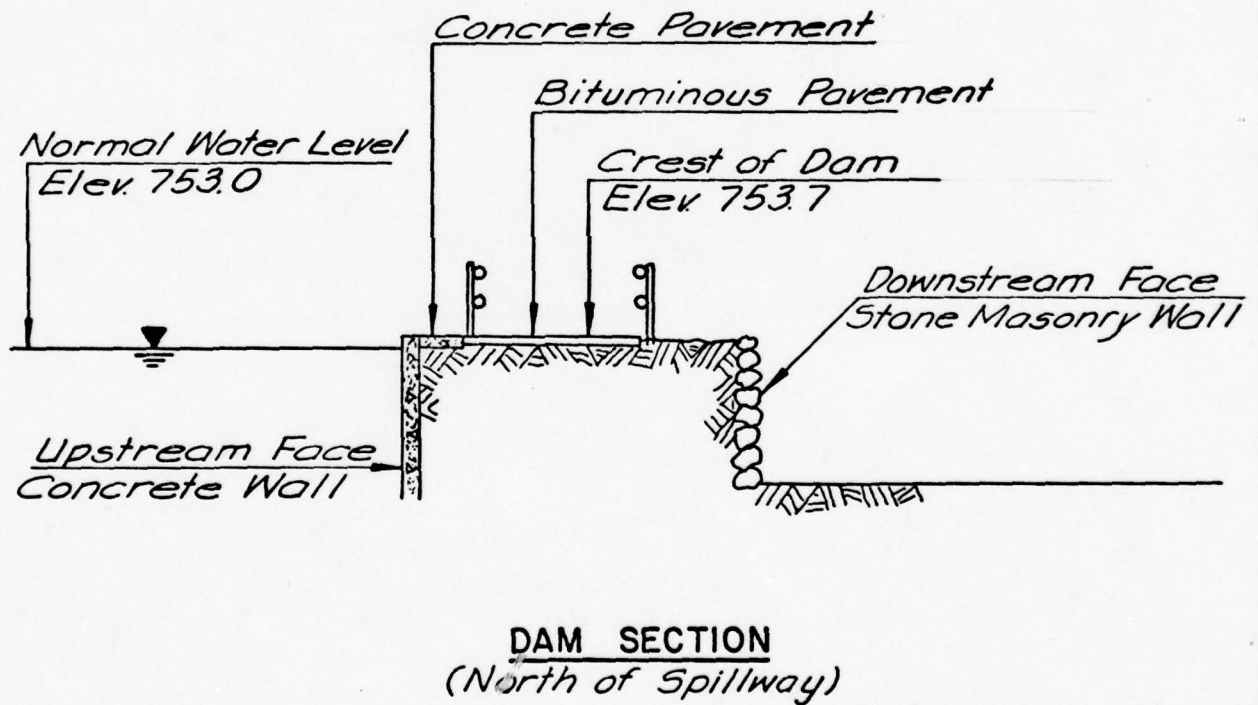
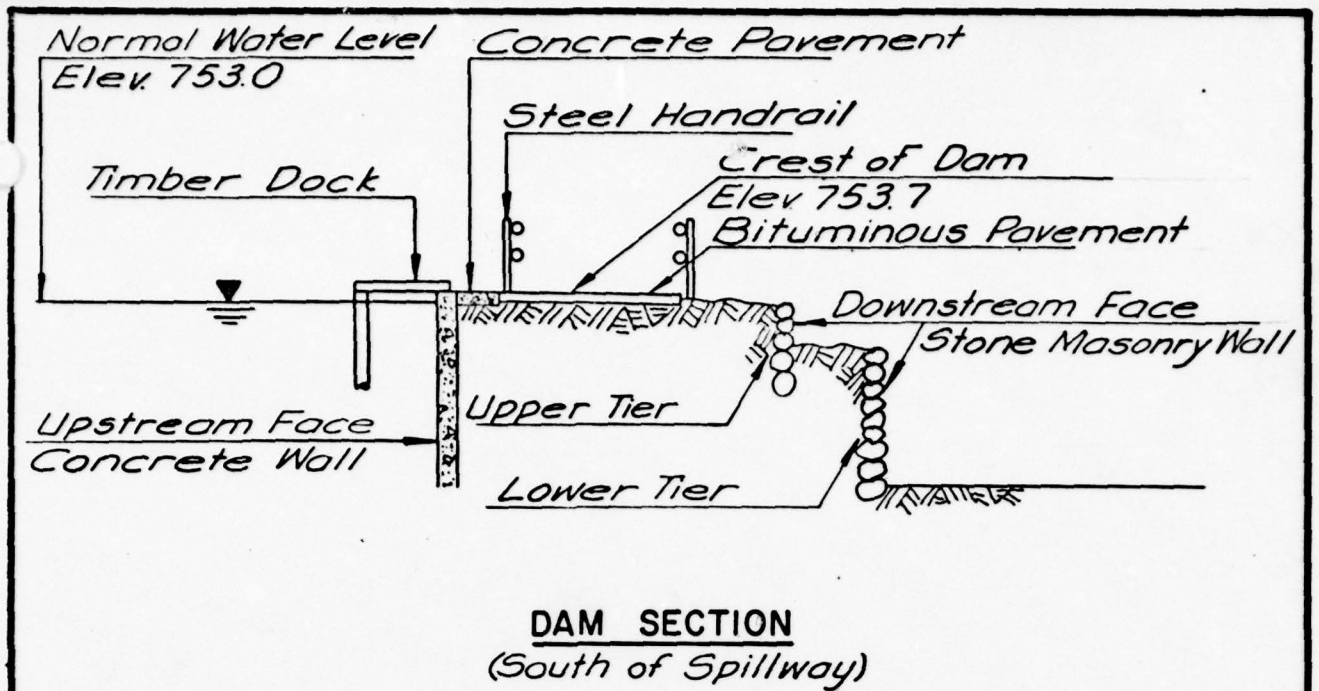


PLATE 6

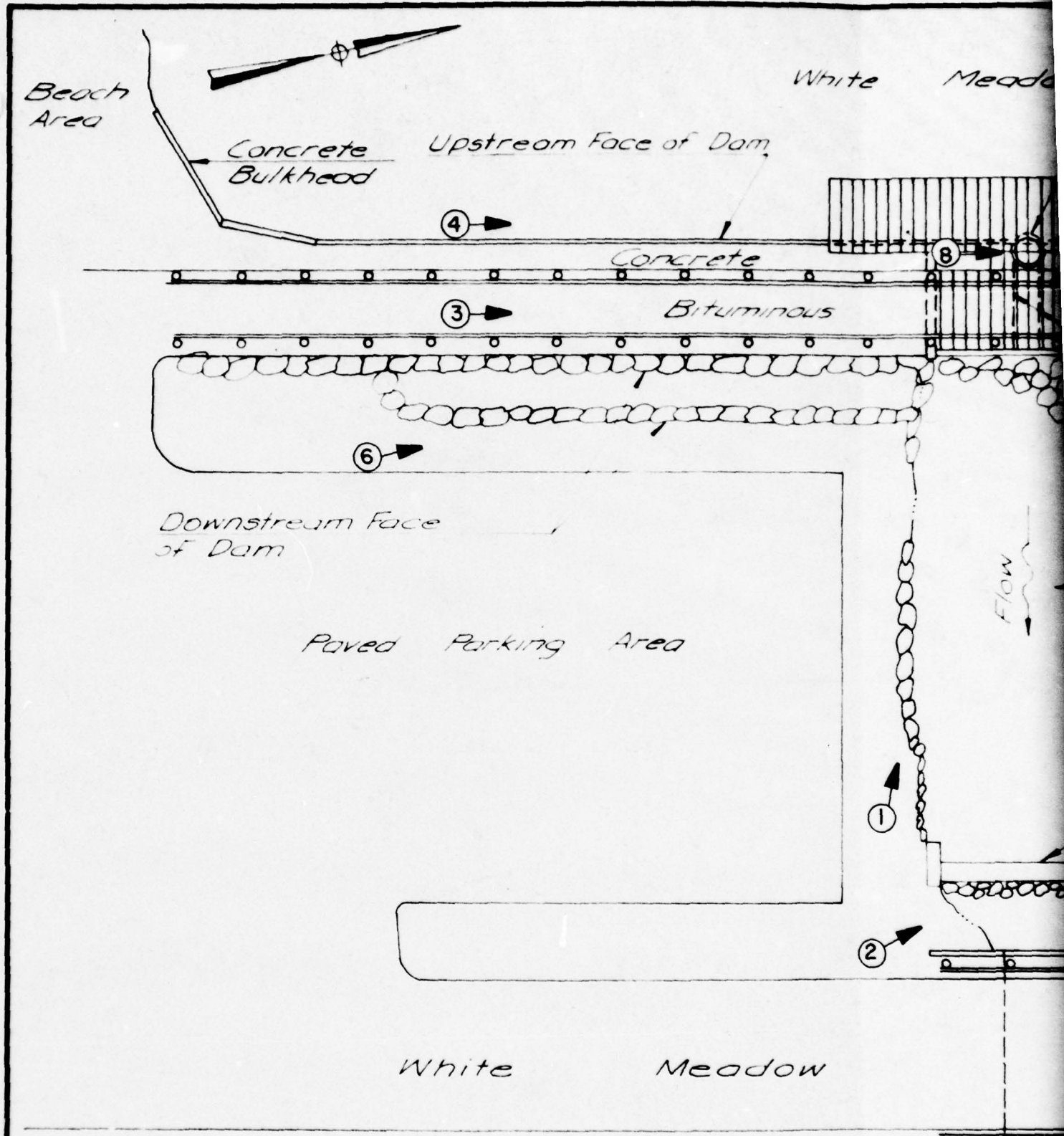
STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS

DAM SECTIONS
WHITE MEADOW LAKE DAM

| | |
|--------------|---------------------|
| I.D. NJ00340 | SCALE: NOT TO SCALE |
| | DATE: JULY, 1979 |



Note Information taken from field inspection April 30, 1979

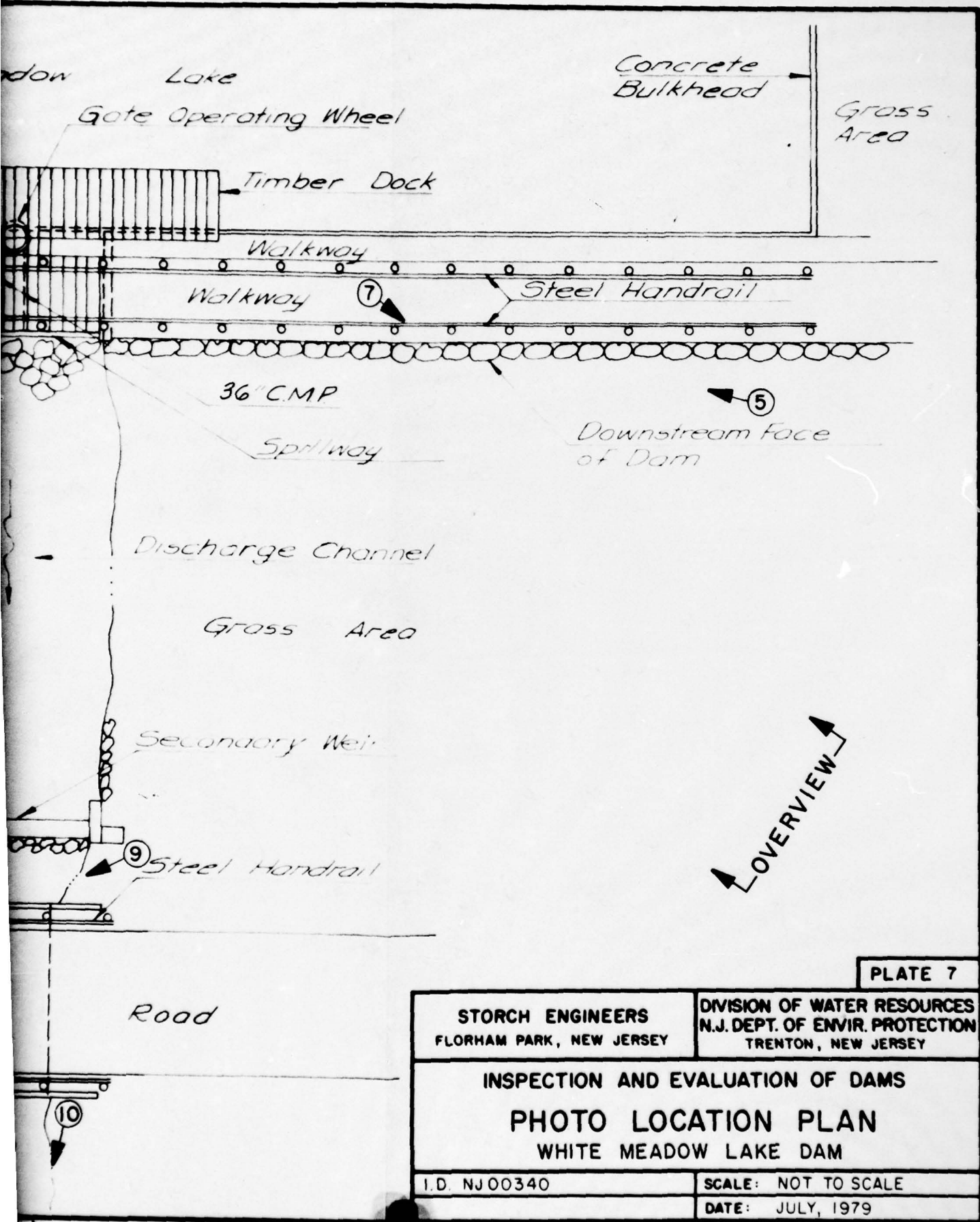


PLATE 7

| | |
|---|---|
| <p>STORCH ENGINEERS FLORHAM PARK, NEW JERSEY</p> | <p>DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY</p> |
| <p>INSPECTION AND EVALUATION OF DAMS PHOTO LOCATION PLAN WHITE MEADOW LAKE DAM</p> | |
| <p>I.D. NJ00340</p> | <p>SCALE: NOT TO SCALE DATE: JULY, 1979</p> |

2

APPENDIX 1

Check List - Visual Inspection

Check List - Engineering Data

Check List
Visual Inspection
Phase I

Name of Dam White Meadow Lake County Morris State New Jersey Coordinators NJDEP

Date(s) Inspection 4/30/79 Weather Fair Temperature 75°F

Pool Elevation at Time of Inspection 753.0 M.S.L. Tailwater at Time of Inspection 742.6 M.S.L.

Inspection Personnel:

John Gribbin David Hoyt
Ronald Lai Joseph Fox
Richard McDermott John Gribbin Recorder

CONCRETE/MASONRY DAMS

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|--------------|----------------------------|
| GENERAL | N.A. | |
| STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS | N.A. | |
| DRAINS | N.A. | |
| WATER PASSAGES | N.A. | |
| FOUNDATION | N.A. | |
| VERTICAL AND HORIZONTAL ALIGNMENT | N.A. | |

CONCRETE/MASONRY DAMS

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-------------------------------------|--------------|----------------------------|
| SURFACE CRACKS CONCRETE SURFACES | N.A. | |
| STRUCTURAL CRACKING | N.A. | |
| CONSTRUCTION JOINTS | N.A. | |
| MONOLITH JOINTS | N.A. | |
| LEAKAGE | N.A. | |
| SEEPAGE | N.A. | |

EMBANKMENT

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|---|---|---|
| GENERAL | Crest of dam, adjacent to paved walkway, planted with shrubs and ground cover. Also, trees present on crest and on lower tier along south section. | |
| JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM | Junctions between embankment and spillway abutments appear to be in satisfactory condition. | |
| ANY NOTICEABLE SEEPAGE | <p>Two seepage zones observed.</p> <ol style="list-style-type: none"> 1. Seepage observed as wet area at toe of wall 36' south of spillway. 2. Possible seepage observed as discharge at toe of wall approx. 2' south of spillway. | |
| UPSTREAM FACE | Due to water level, only the top of wall was observed. Concrete appeared to be in satisfactory condition. South section appeared to have been repaired by a shotcrete-type process. Construction joint between wall and concrete sidewalk generally in satisfactory condition with some separation noted along the south section. | Upstream face of dam consists of vertical concrete wall. |
| DOWNSTREAM FACE | Wall along north section generally in satisfactory condition. Portion of lower tier of south section tilted in downstream direction. Upper tier in generally satisfactory condition. | Downstream face of dam consists of vertical stone wall along north section and two-tiered stone masonry wall along south section. |

EMBANKMENT

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|---|----------------------------|
| SURFACE CRACKS | Several longitudinal cracks observed in bituminous pavement on crest approx. 1' to 2' from downstream face. | |
| UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE | Generally, none apparent. Portion of stone masonry wall along south section of downstream face is tilted. | |
| SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES | Bituminous pavement failed in one small area near downstream side of crest. (Failure resembles "pothole".) | |
| VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST | Vertical: level Horizontal: straight | |
| RIPRAP FAILURES | N.A. | |

OUTLET WORKS

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|--|--|
| CONCRETE SURFACES IN OUTLET CONDUIT | N.A. | |
| INTAKE STRUCTURE | Submerged | |
| OUTLET STRUCTURE | Corrugated metal pipe outletting at spillway was obscured by discharge over spillway. The pipe appeared to be in a generally deteriorated condition. | Recommend inspection with lake drawn down. |
| OUTLET CHANNEL | | Same as discharge channel for spillway. |
| GATE AND GATE HOUSING | Gate could not be observed. Gate operating wheel appeared to be in adequate condition. | Gate was not operated at the time of inspection. |

SPILLWAY

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|--|---|
| CONCRETE WEIR | Surface of crest appears level but concrete is eroded with aggregate exposed. | Surface obscured by discharge and timber walkway. |
| APPROACH CHANNEL | Bottom formed by concrete slab across crest of dam. Sides formed by spillway abutments. Condition appeared satisfactory but channel obscured by discharge and by walkway. | |
| DISCHARGE CHANNEL | Earth channel conveys discharge approx. 80 ft. downstream to secondary concrete weir immediately upstream from secondary road. Discharge from secondary weir flows under road via concrete bridge in generally good condition. | |
| GENERAL | Concrete abutments appeared to be in good condition. | |
| WALKWAY | Timber walkway spans spillway approach channel. Walkway appeared to be in satisfactory condition with paint partially worn. | Timber swimming dock is located along upstream side of dam in vicinity of spillway. |

INSTRUMENTATION

| VISUAL EXAMINATION | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|--------------|----------------------------|
| MONUMENTATION/SURVEYS | None | |
| OBSERVATION WELLS | None | |
| WEIRS | None | |
| PIEZOMETERS | None | |
| OTHER | N.A. | |

RESERVOIR

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|------------------------|--|----------------------------|
| SLOPES | Shore slopes range from 5% to 20% with an average of approx. 8%. | |
| SEDIMENTATION | Unknown. | |
| STRUCTURES ALONG BANKS | Homesites are located along most of shoreline. Docks and other lake related structures are present at some of the homesites. | |
| | | |
| | | |

DOWNSTREAM CHANNEL

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|---|--|----------------------------|
| <p>CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)</p> | <p>Well defined stream with no significant obstructions observed. Land along most of the length of the stream consists of the back yards of homes.</p> | |
| <p>SLOPES</p> | <p>Bank slopes range from 5% to 20%.</p> | |
| <p>STRUCTURES ALONG BANKS</p> | <p>Approx. twelve homes located along downstream channel within 1000' of the dam.</p> | |
| | | |
| | | |

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

| ITEM | REMARKS |
|--|---------------|
| DAM - PLAN | Not Available |
| SECTIONS | Not Available |
| SPILLWAY - PLAN | Not Available |
| SECTIONS | Not Available |
| DETAILS | Not Available |
| OPERATING EQUIPMENT PLANS & DETAILS | Not Available |
| OUTLETS - PLAN | Not Available |
| DETAILS | Not Available |
| CONSTRAINTS | Not Available |
| DISCHARGE RATINGS | Not Available |
| HYDRAULIC/HYDROLOGIC DATA | Not Available |
| RAINFALL/RESERVOIR RECORDS | Not Available |
| CONSTRUCTION HISTORY | Not Available |
| LOCATION MAP | Available |

REMARKS

ITEM

DESIGN REPORTS

Not Available

GEOLOGY REPORTS

Not Available

DESIGN COMPUTATIONS
HYDROLOGY & HYDRAULICS
DAM STABILITY
SEEPAGE STUDIES

Not Available
Not Available
Not Available

MATERIALS INVESTIGATIONS
BORING RECORDS
LABORATORY
FIELD

Not Available

POST-CONSTRUCTION SURVEYS OF DAM

Not Available

BORROW SOURCES

Not Available

APPENDIX 2

Photographs

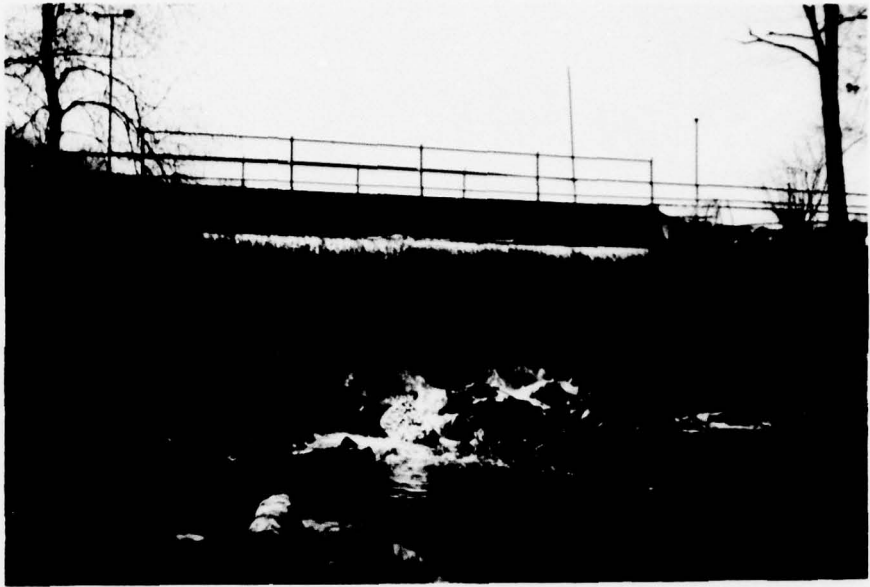


PHOTO 1
SPILLWAY

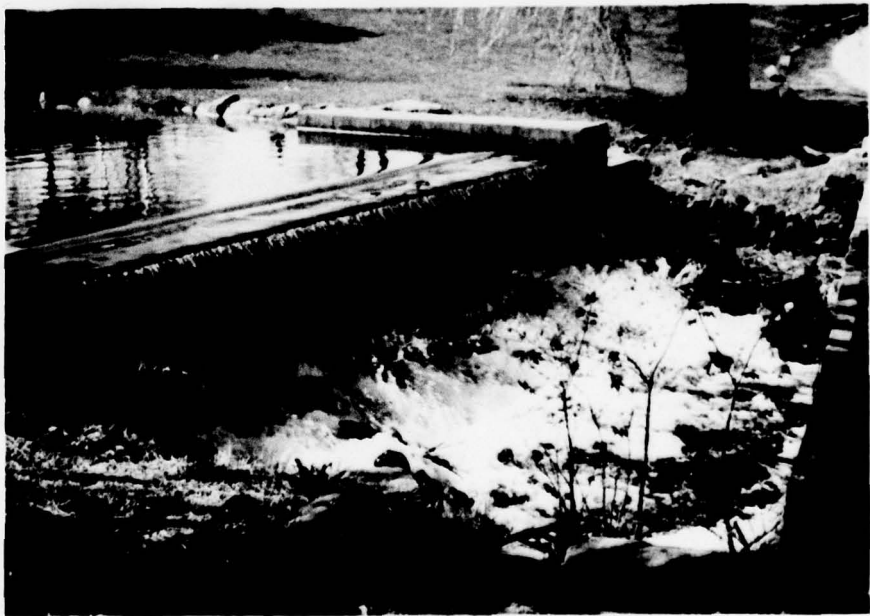


PHOTO 2
SPILLOVER AT DOWNSTREAM END OF SPILLWAY DISCHARGE CHANNEL

WHITE MEADOW LAKE DAM
30 APRIL 1979



PHOTO 3
CREST OF DAM



PHOTO 4
UPSTREAM FACE OF DAM

WHITE MEADOW LAKE DAM
30 APRIL 1979



PHOTO 5

DOWNSTREAM FACE OF NORTH SECTION OF DAM



PHOTO 6

DOWNSTREAM FACE OF SOUTH SECTION OF DAM

WHITE MEADOW LAKE DAM
30 APRIL 1979

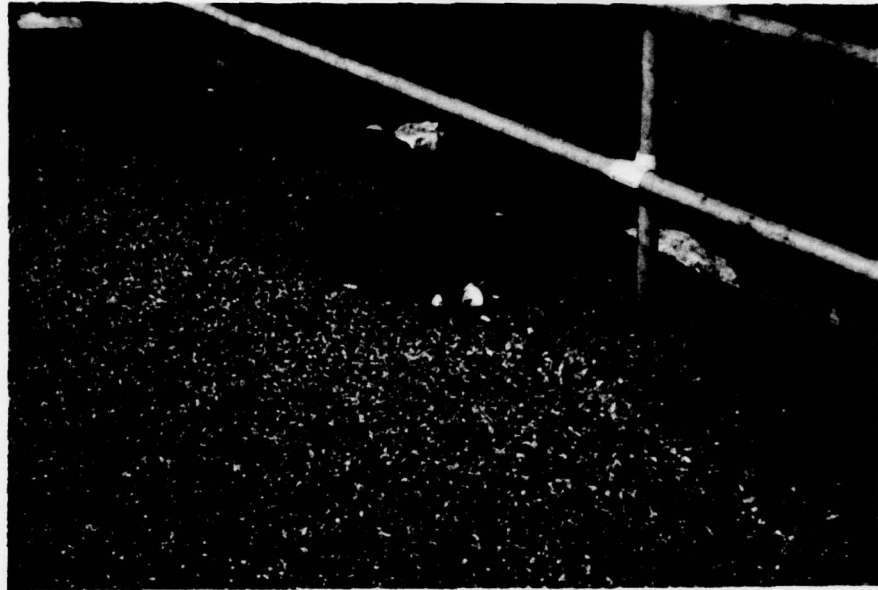


PHOTO 7

PAVEMENT FAILURE ON DAM CREST

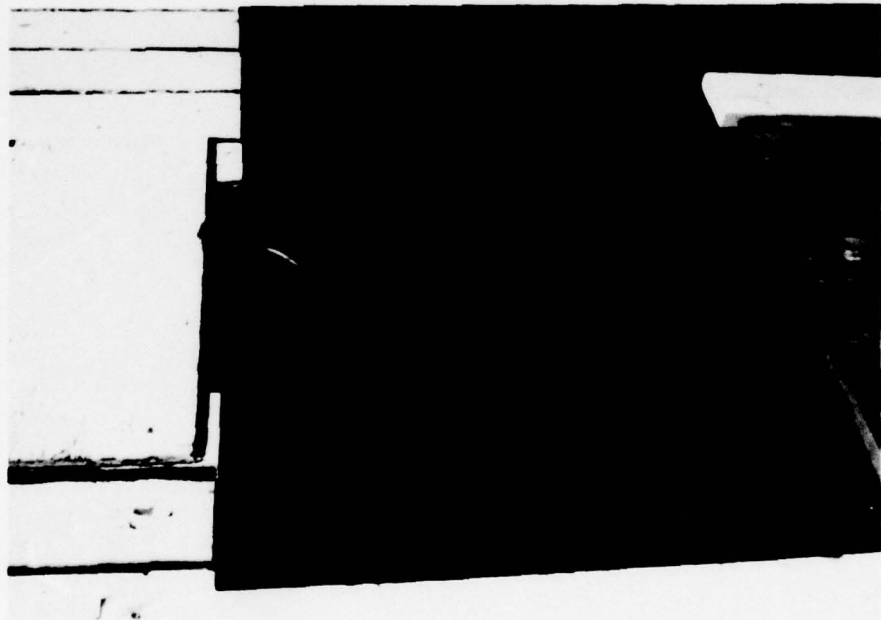


PHOTO 8

OUTLET WORKS OPERATING MECHANISM

WHITE MEADOW LAKE DAM
30 APRIL 1979



PHOTO 9

BRIDGE DOWNSTREAM FROM DAM



PHOTO 10

DOWNSTREAM CHANNEL

WHITE MEADOW LAKE DAM
30 APRIL 1979

APPENDIX 3

Engineering Data

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: Mainly wooded

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 753.0 (320 acre-feet)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): N.A.

ELEVATION MAXIMUM DESIGN POOL: 755.1

ELEVATION TOP DAM: 753.7

SPILLWAY CREST: Concrete Weir

- a. Elevation 752.7
- b. Type Uncontrolled Weir
- c. Width 20 feet
- d. Length 29 feet
- e. Location Spillover Downstream side of dam
- f. Number and Type of Gates N.A.

OUTLET WORKS: Gated Pipe

- a. Type 36" corrugated metal pipe with lift gate
- b. Location At center of spillway
- c. Entrance inverts Unknown
- d. Exit inverts 744.9
- e. Emergency draindown facilities: Open gate

HYDROMETEOROLOGICAL GAGES: None

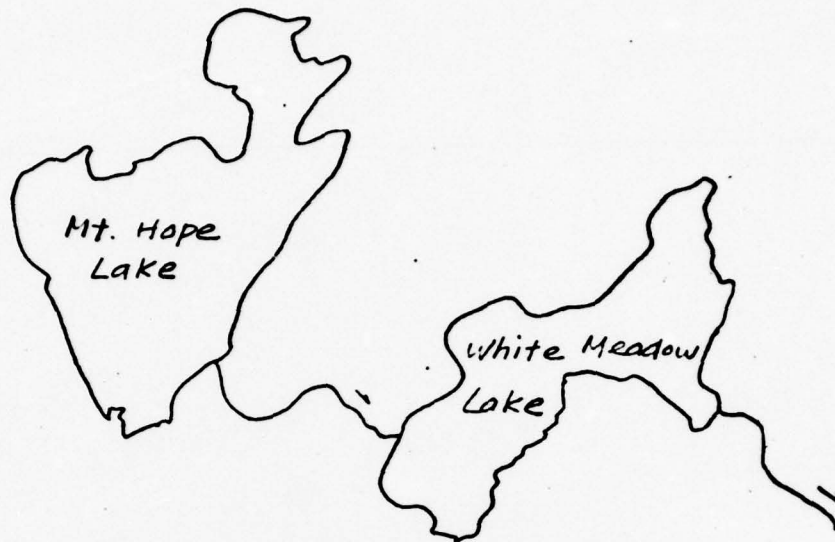
- a. Type N.A.
- b. Location N.A.
- c. Records N.A.

MAXIMUM NON-DAMAGING DISCHARGE:

(Lake stage equal to top of dam) 76 c.f.s.

APPENDIX 4

Hydrologic Computations



Mt. Hope Lake is directly upstream of White Meadow Lake. The inflow hydrograph to White Meadow Lake Dam is the sum of outflow from Mt. Hope Lake and runoff from White Meadow Lake watershed area under the SDF of 0.5 PMF conditions.

Enclosed calculation:

Part A : H/H calculation for Mt Hope Lake

Part B : H/H calculation for White Meadow Lake.

Part C : Breach Analysis

Part A

Hydrologic Analysis

Runoff hydrograph by HEC-1-DB using
SCS UHG and routed by The Modified
Puls method. Drainage Area = 1.9 Sq. mile

Infiltration Data

Drainage area is mainly wooded

Use initial infiltration 1.5 in

constant infiltration 0.15 in/hr.

Time of Concentration By SCS TR-55

Length of overland flow = 1700 ft.
Slope = 0.12
Vel of travel = 0.9 ft/sec

Length of channel flow = 2200
Slope = 0.03
Vel of travel = 2.5 ft/sec

$$TC = \left(\frac{1700}{0.9} + \frac{2200}{2.5} \right) \times \frac{1}{3600} = \underline{0.77 \text{ hr.}}$$

Time of Concentration by "Design of Small Dam"
SCS Nomograph
Pg 71

$$H = 240'$$

$$L = 3900'$$

$$T_c = 0.21 \text{ hr.}$$

Time of Concentration by Kerby
Pg 14-36
"Handbook of Applied
Hydrology" by Chow

$$t_c^{2.14} = \frac{2}{3} \frac{L\eta}{\sqrt{S}}$$

t_c = time of concentration in min

L = length of overland flow in ft

S = slope

$\eta = 0.4$ Roughness Coef.

$$t_c^{2.14} = \frac{2}{3} \frac{1700 \times 0.4}{\sqrt{0.12}}$$

$$t_c = 28.6 \text{ min} = 0.48 \text{ hr.}$$

t_c for channel flow 0.24 hr. from
previous page

$$T_c = 0.48 + 0.24 = \underline{0.72 \text{ hr.}}$$

For HEC - 1 input

$$\text{Use } T_c = \underline{\underline{0.7 \text{ hr.}}}$$

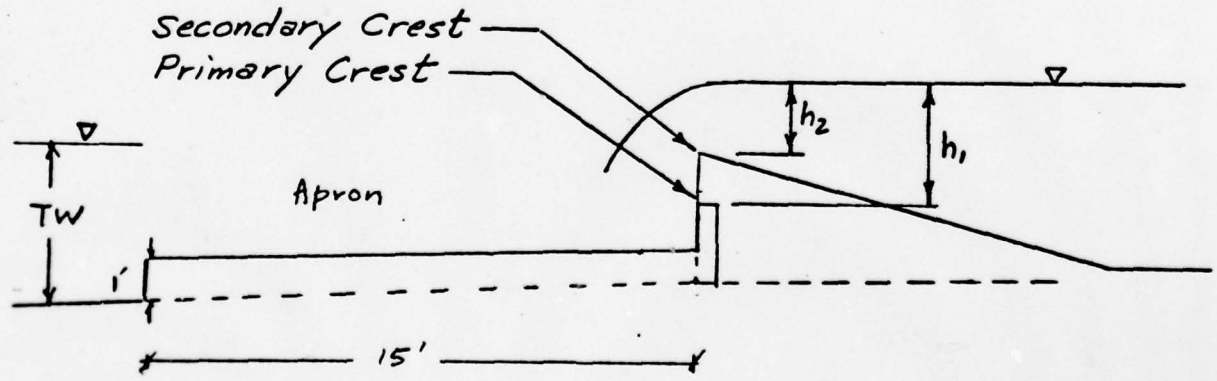
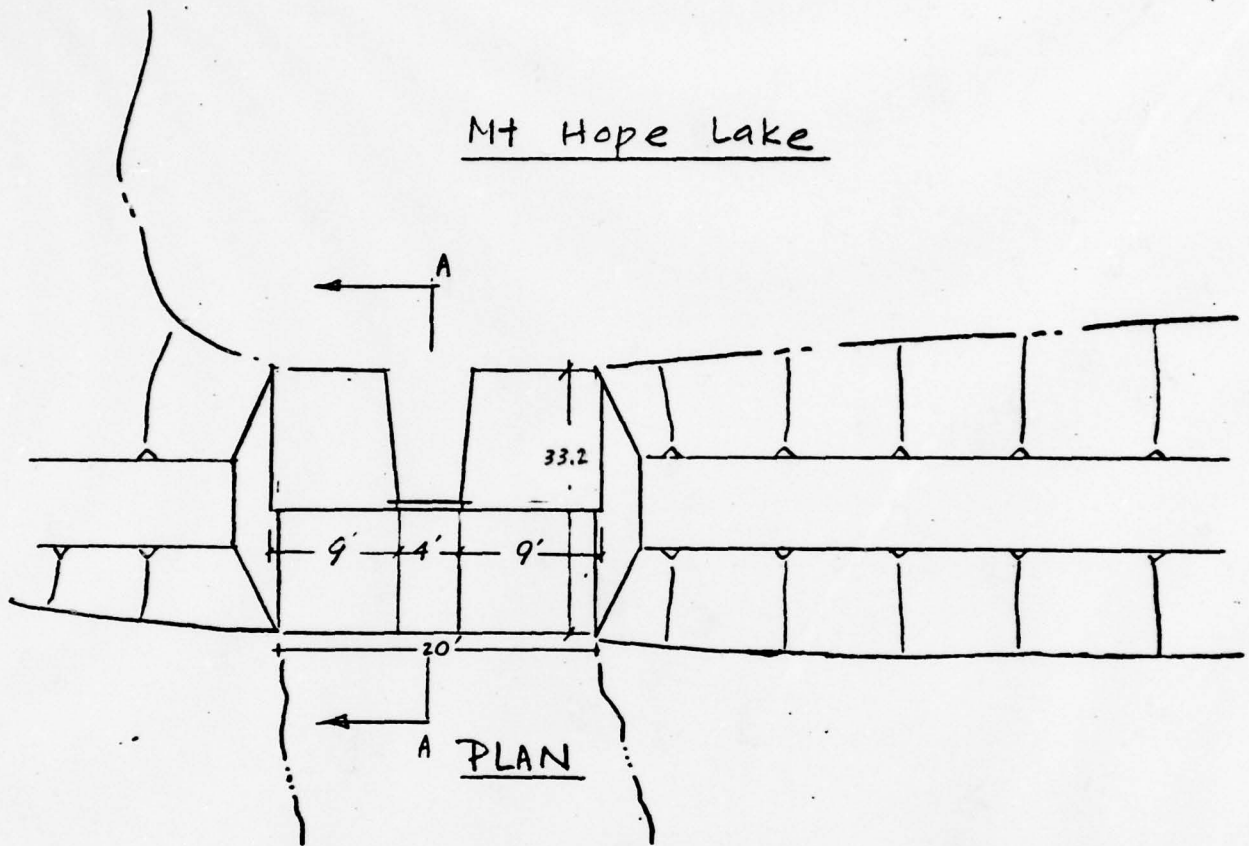
$$\text{Lag} = 0.7 \times 0.6 = \underline{\underline{0.42 \text{ hr.}}}$$

Lake Storage Volume

Information from USGS 9 Aerial Photos

| Elev (M.S.L.) | Surface Area (Ac.) |
|---------------|--------------------|
| 797 | 190 |
| 800 | 294 |
| 820 | 420 |

HEC - 1 - DB program will develop
storage capacity from surface area
and elev.



SPILLWAY SECTION AA

SPILLWAY DISCHARGE

Spillway discharge flows over weirs at two levels with effective lengths L_1 and L_2 respectively. L_1 is a broad-crest weir and L_2 is a sharp crest weir with triangular section.

Discharge Q can be calculated by

The following formula:

$$Q = CLh^{3/2}$$

C for primary crest
use 3.1

C for secondary crest 3.6

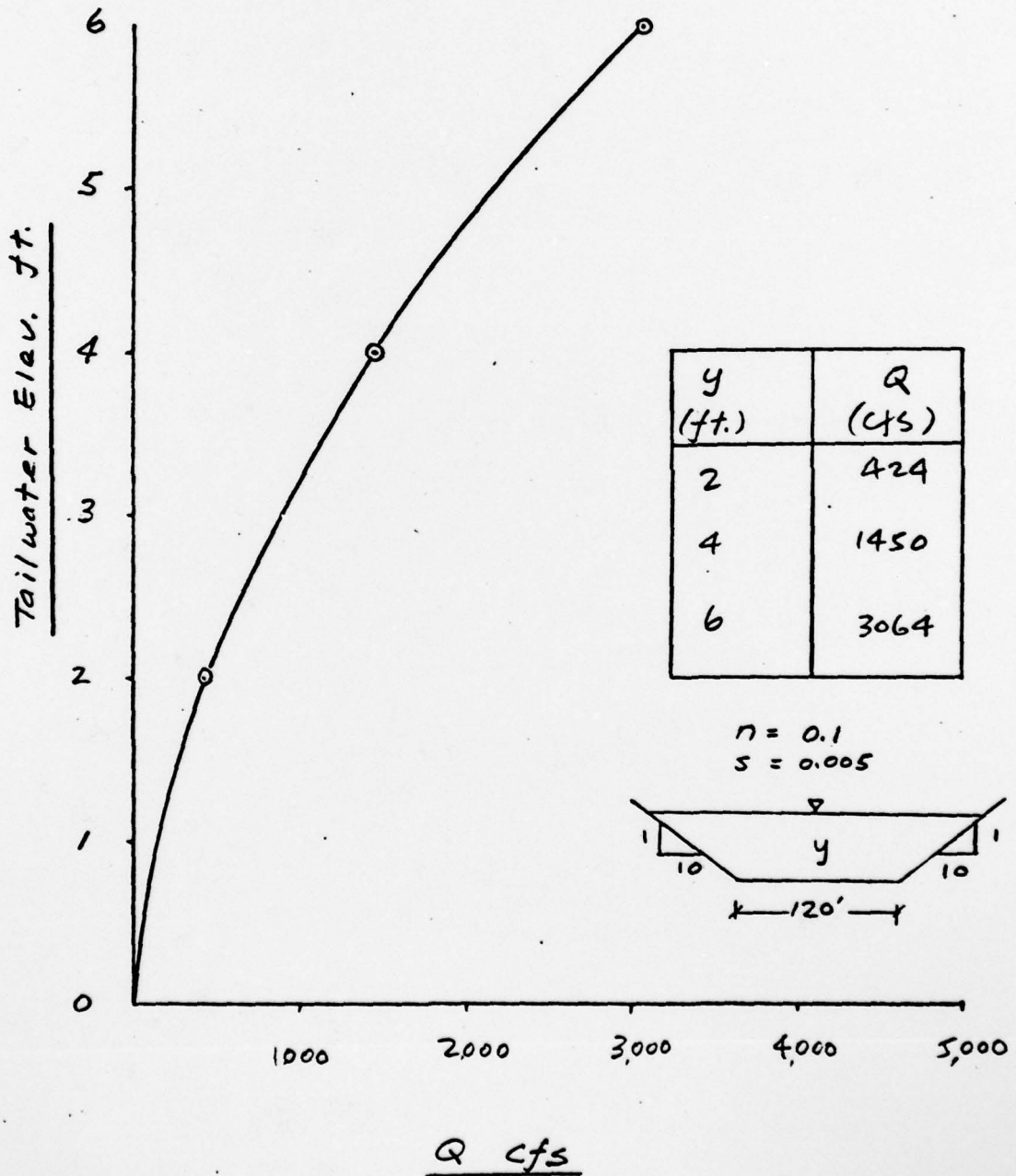
Since weir is low and downstream

channel is shallow, the effect of tailwater is significant. A rough estimate of tailwater elevation is shown on the following page.

These estimates are obtained by using a section 100' downstream and Mannings equation.

Downstream Channel Tailwater

Stage Discharge Curve

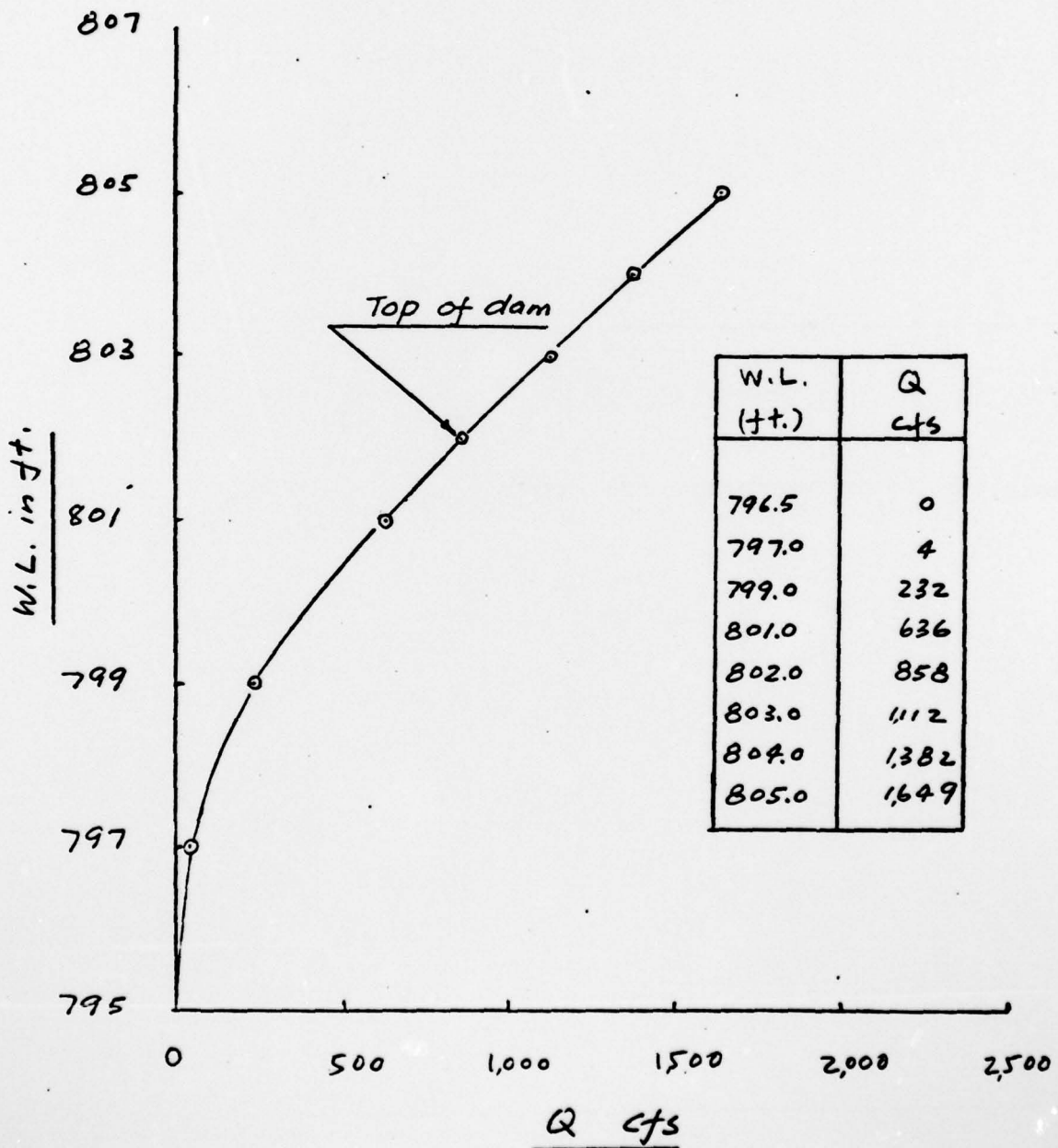


Stage Discharge Tabulation

| W.L. (ft) | h_1 | h_2 | Q_1 (cfs) | Q_2 (cfs) | Tailwater elev. (ft) | C adj. factor | ΣQ (cfs) |
|--------------|-------|-------|----------------|----------------|-------------------------|---------------------|---------------------|
| 796.5 | 0 | 0 | 0 | 0 | - | - | 0 |
| 797.0 | 0.5 | 0 | 4 | 0 | - | - | 4 |
| 799.0 | 2.5 | 2.0 | 49 | 183 | 1.3 | - | 232 |
| 801.0 | 4.5 | 4.0 | 118 | 518 | 2.3 | - | 636 |
| 802.0 | 5.5 | 5.0 | 160 | 724 | 2.6 | 0.97 | 858 |
| 803.0 | 6.5 | 6.0 | 206 | 952 | 3.1 | 0.96 | 1112 |
| 804.0 | 7.5 | 7.0 | 255 | 1200 | 3.9 | 0.95 | 1382 |
| 805.0 | 8.5 | 8.0 | 307 | 1466 | 4.5 | 0.93 | 1649 |

Note: Adjustment factor applied
when weir is submerged.
Ref. 5-18 Handbook of Hydraulics
King et al.

Stage Discharge Curve
for
Spillway



Part B

Hydrologic Analysis

Runoff hydrograph of White Meadow Lake will be combined with outflow hydrograph of Mt. Hope Lake and then routed through White Meadow Lake Dam.

Infiltration Data

Drainage area is mostly wooded.

use 1.5 in initial and 0.15 in/hr.

constant infiltration.

Time of concentration

TR-55 SCS

(For White Meadow Lake area)

Length of overland flow = 3,000 ft

Slope = 5.6 %

vel. of travel = 0.6 ft/sec

$$T_c = \frac{3000}{0.6} \times \frac{1}{3600} = 1.38 \text{ hr.}$$

Time of Concentration by "Design of Small Dams"SCS Nomograph
Pg 71

$$H = 170'$$

$$L = 3000'$$

$$T_c = 0.19 \text{ hr.}$$

Time of Concentration by Kerby

Pg 14-36

"Handbook of Applied
Hydrology" by Chow

$$t_c^{2.14} = \frac{2}{3} \frac{L\eta}{\sqrt{S}}$$

 t_c = time of concentration in min.

L = length of overland flow in ft.

S = Slope

 $\eta = 0.8$ Roughness coef. dense grass

$$t_c^{2.14} = \frac{2}{3} \frac{3000(0.8)}{\sqrt{0.056}}$$

$$t_c = 62 \text{ min} = 1.03 \text{ hr.}$$

$$\text{use } T_c = \underline{\underline{1.1}} \text{ hr.}$$

$$Lag = 0.6(1.1) = \underline{\underline{0.66}} \text{ hr.}$$

STORCH ENGINEERS

Sheet 3 of 8

Project White Meadows Lake Dam

Made By RL Date 6-18-79

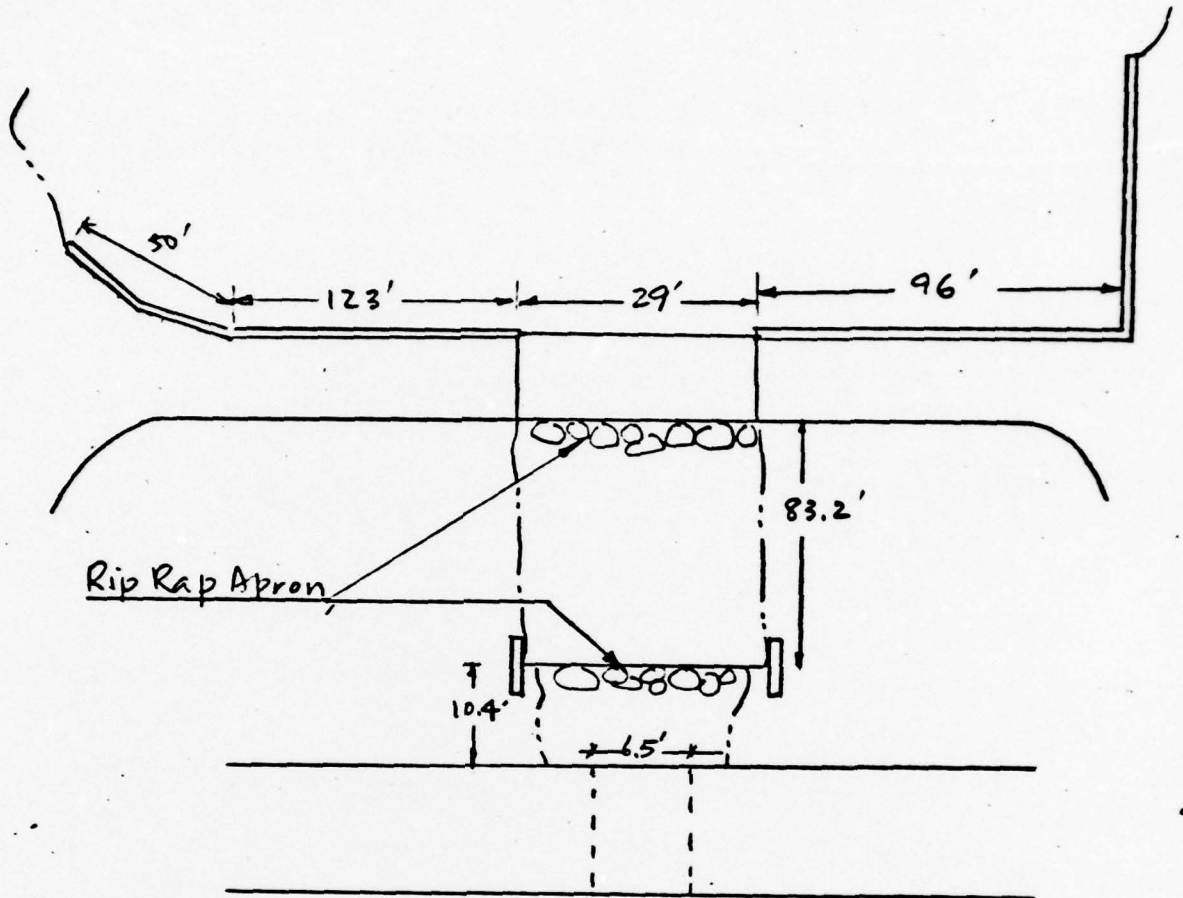
Chkd By DHP Date 6-26-79

Lake storage volume

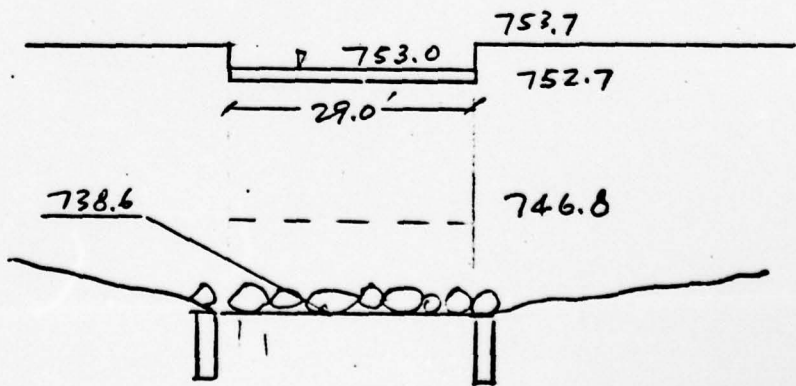
Information from USGS Maps & Aerial Photos

| Elev. (MS.L) | Surface Area (Ac) |
|--------------|-------------------|
| 745 | 0 |
| 753 | 137 |
| 766 | 184 |

HEC-1-DB program will develop
Storage capacity from surface
area and elev.



Plan of Spillway



Front Elevations

Spillway Discharge

Spillway is a concrete broad crested weir
with effective length 29'.

Discharge Q can be calculated by

$$Q = CLh^{3/2}$$

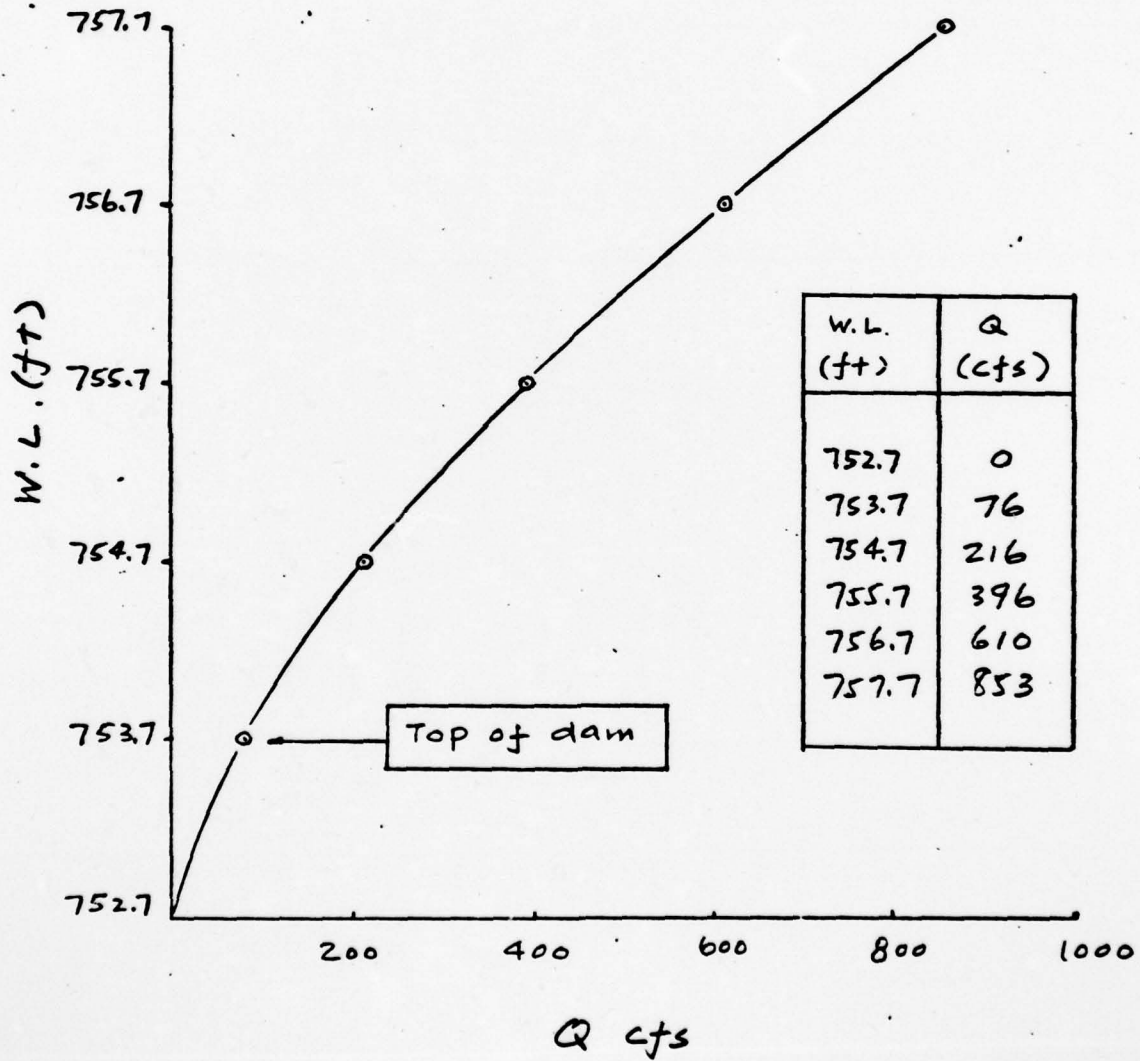
$$C = 2.63$$

Tailwater has no effect on spillway
discharge.

Stage Discharge Tabulation

| W.L. (ft) | h (ft) | Q (cfs) |
|--------------|-------------|--------------|
| 752.7 | 0 | 0 |
| 753.7 | 1 | 76 |
| 754.7 | 2 | 216 |
| 755.7 | 3 | 396 |
| 756.7 | 4 | 610 |
| 757.7 | 5 | 853 |

Spillway
Stage Discharge Curve

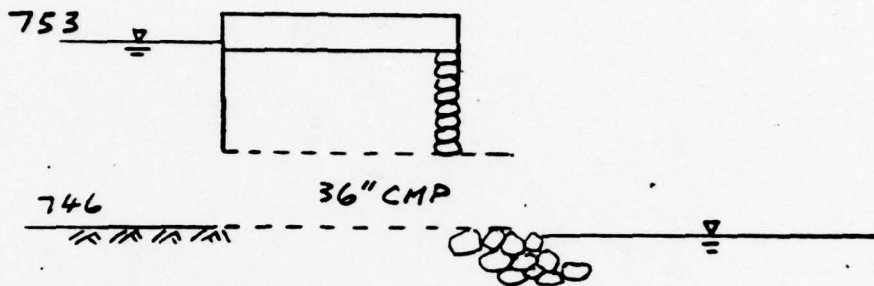


Project White Meadow Lake
1132B

Made By RL Date 8-17-79
 Chkd By JG Date 8-17-79

Drawdown Calculation

Outlet Works Capacity at normal pool



Ref: "Hydraulic charts for the selection of highway culverts"

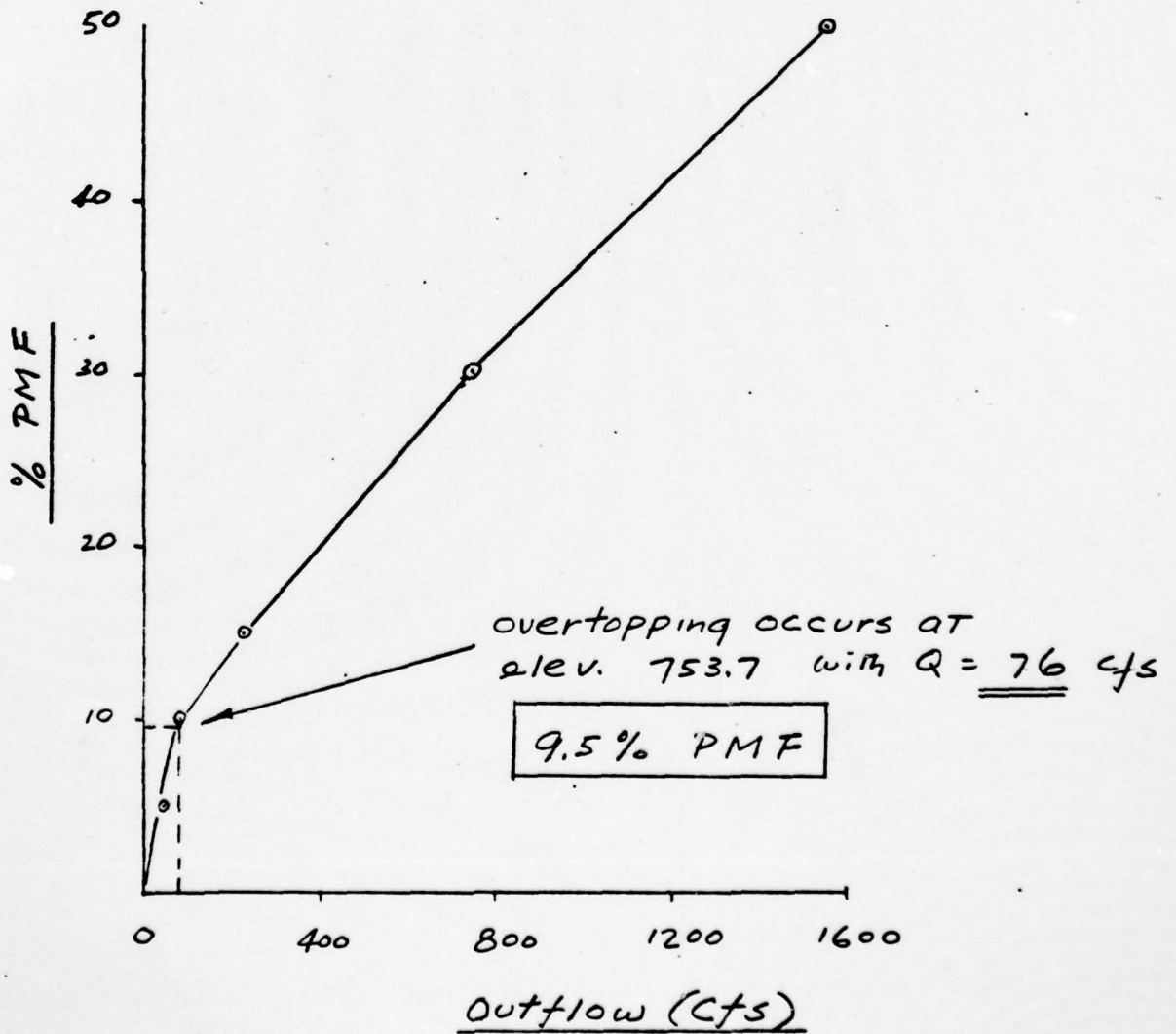
Inlet control for 36" CMP
 $HW/D = 2.33$ $Q = 78$ cfs

Drawdown Calculation

| ELEV | (AC-ft) STORAGE | (AC-ft) Δ STORAGE | (ft) H | (cfs) Q | (cfs) Avg Q | AC-ft/day | days |
|------|--------------------|----------------------|-----------|------------|----------------|-----------|------|
| 755 | — | — | — | — | — | — | — |
| 753 | 320 | 206 | 7 | 78 | 69 | 137 | 1.5 |
| 751 | 114 | 88 | 5 | 60 | 47.5 | 94 | 0.9 |
| 749 | 26 | 25 | 3 | 35 | 22 | 44 | 0.7 |
| 747 | 1 | 1 | 1 | 9 | 4.5 | 9 | 0.1 |
| 746 | 0 | | 0 | 0 | | Total | 3.2 |

days

Overtopping Potential



AD-A074 579

NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON
NATIONAL DAM SAFETY PROGRAM. WHITE MEADOW LAKE DAM (NJ-00340), --ETC(U)
AUG 79 R J MCDERMOTT, J E GRIBBIN

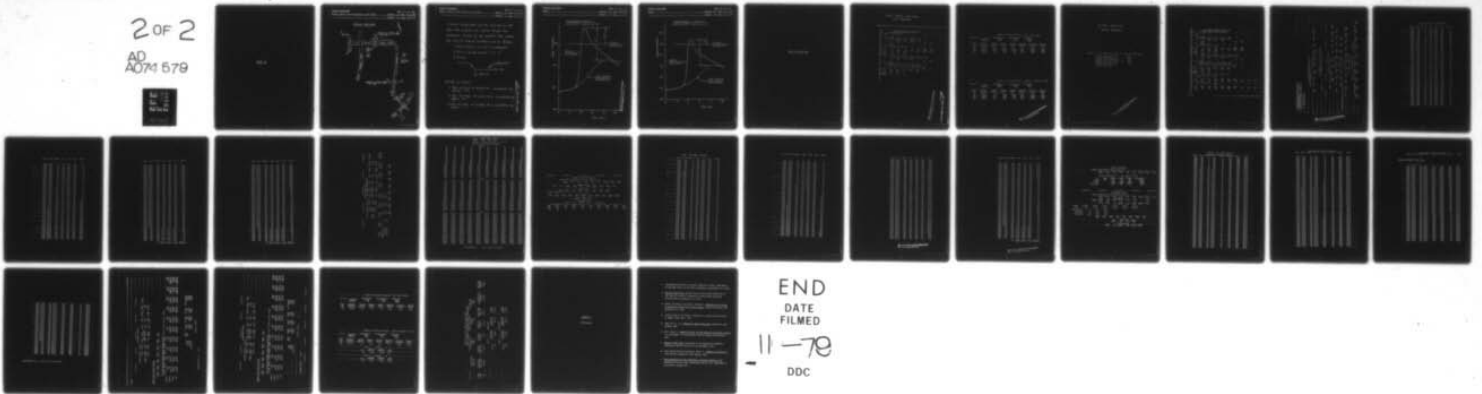
F/G 13/2
DACW61-79-C-0011

UNCLASSIFIED

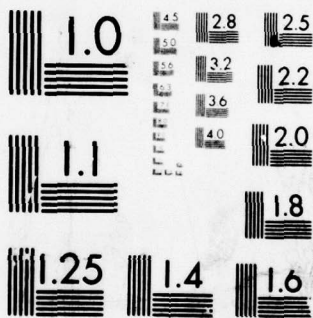
NL

2 OF 2

AD
A074 579



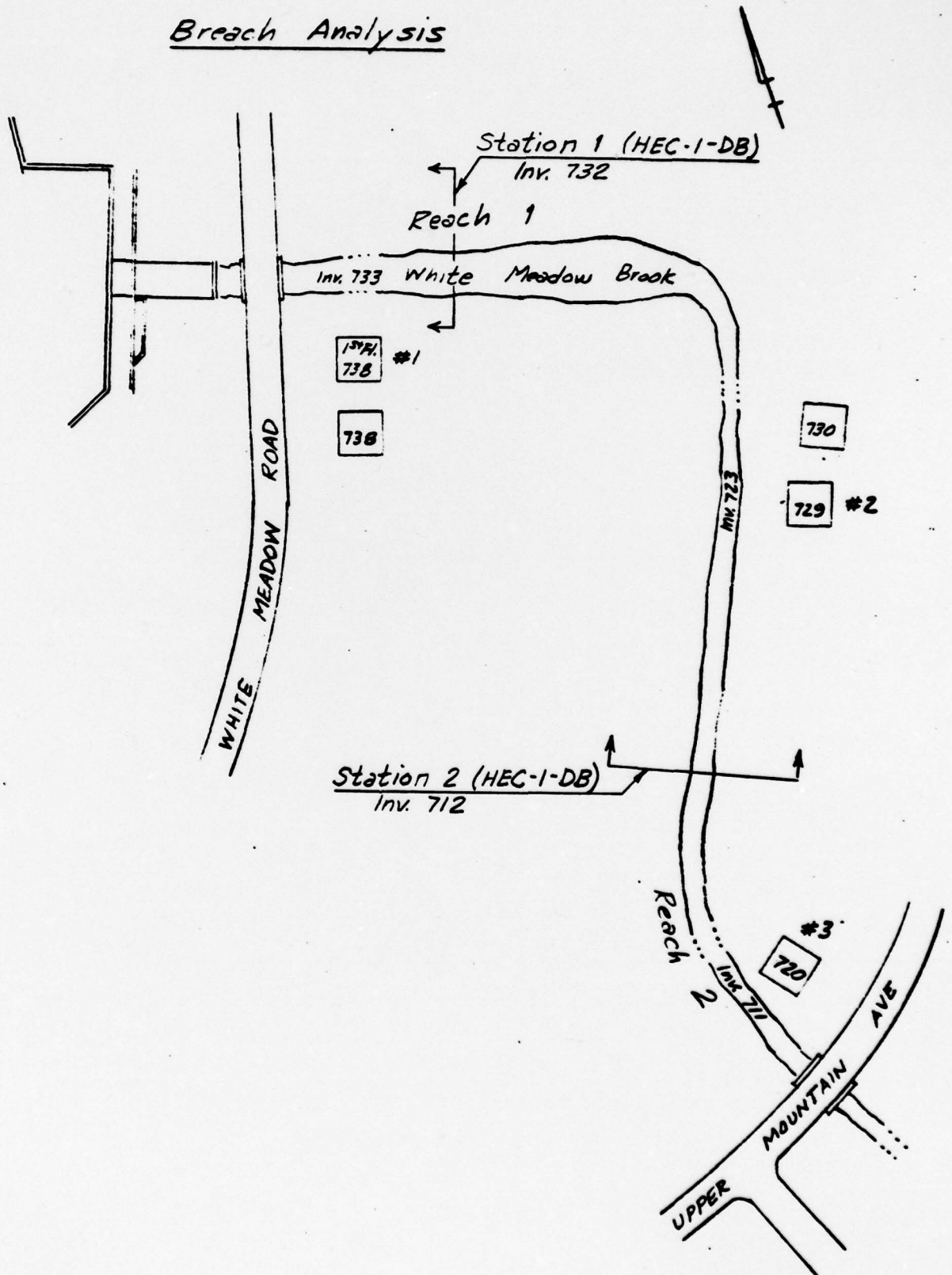
END
DATE
FILMED
11-79
DDC



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

Part C

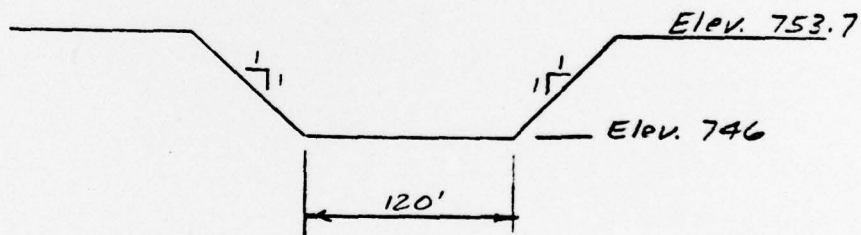
Breach Analysis



A breach hydrograph will be computed by the HEC-1-DB program and routed through two downstream reaches by the modified Puls method.

The assumed breach conditions are as follows:

1. Breach begins when dam is overtopped.
2. Time to develop breach = 0.5 hr.
3. Section:



Results of Breach:

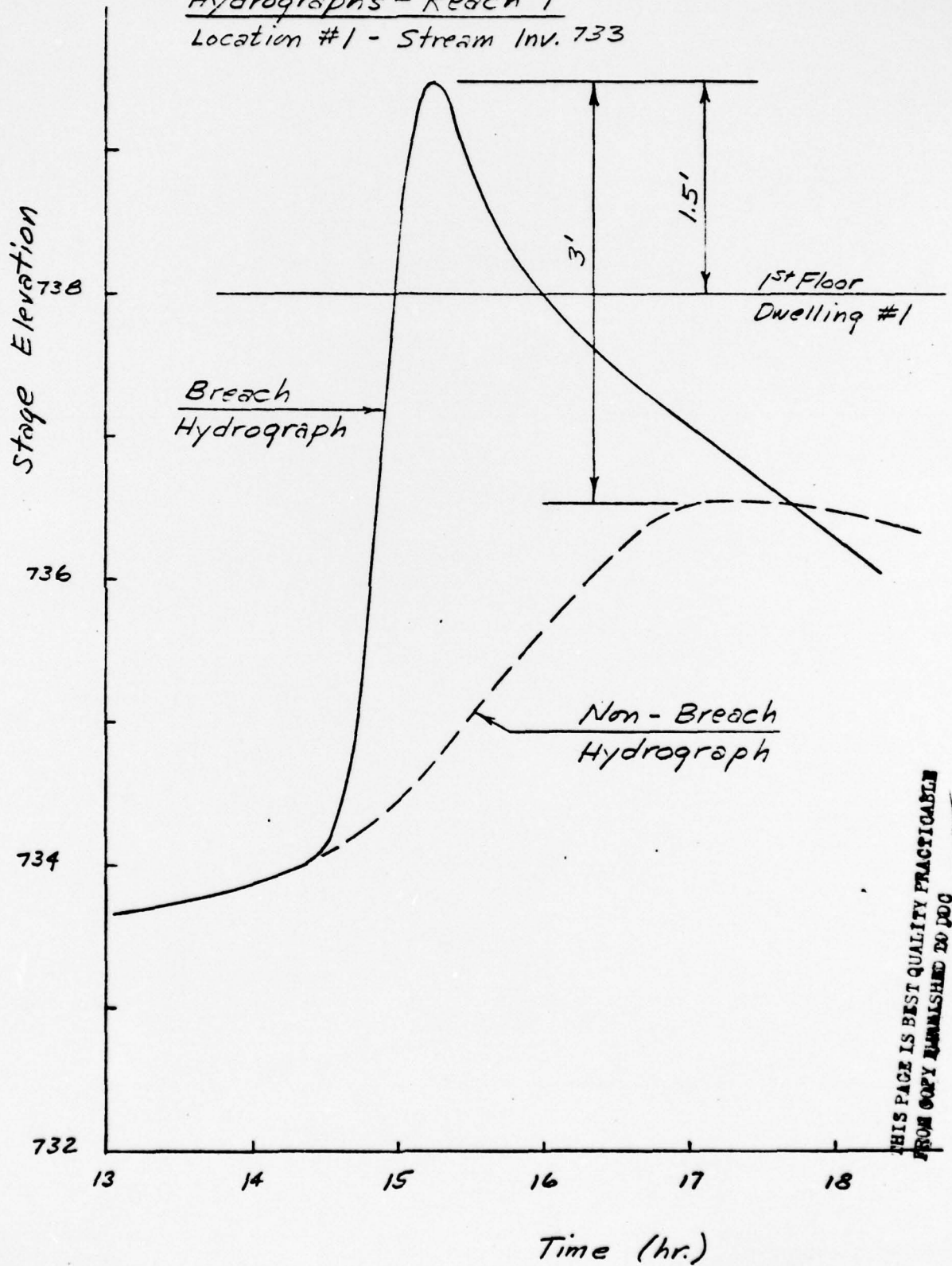
1. Two dwellings at location # 1 inundated by approx. 1.5'.
2. Four dwellings at location # 2 inundated by approx. 2'.
3. One dwelling at location # 3 inundated by approx. 1'.

Project _____

Made By JG Date 7-16-79

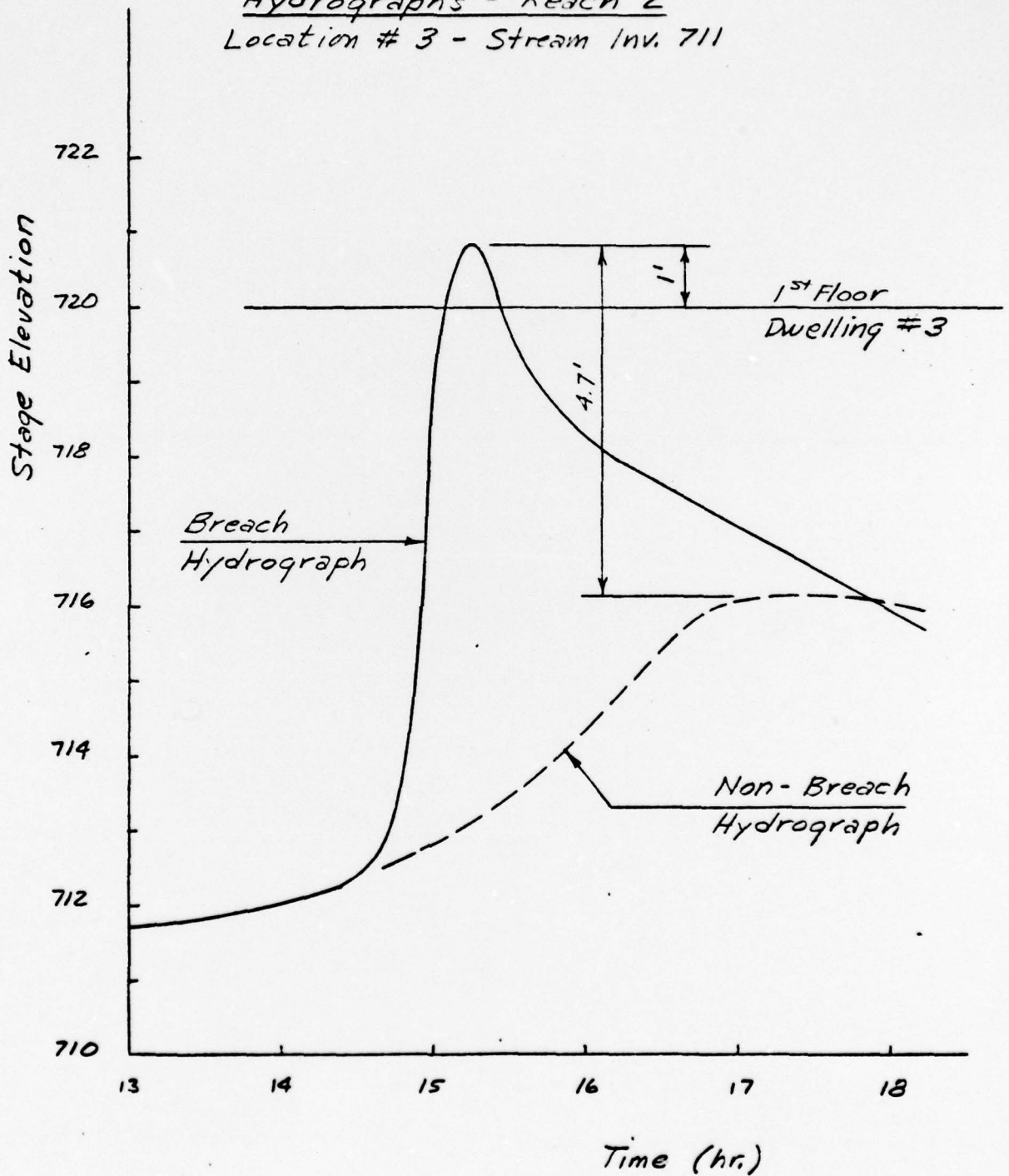
Chkd By RL Date 7-17-79

Hydrographs - Reach 1
Location #1 - Stream Inv. 733



THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

Hydrographs - Reach 2
Location # 3 - Stream Inv. 711



HEC-1-DB COMPUTATIONS

MULTI - RATIO ROUTING (NO BREACH)

| DAM SAFETY ANALYSIS NEW JERSEY | | | | | | | | | | |
|--------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|---|
| MT HOPE/ WHITE MEADOW LAKE DAM | | | | | | | | | | |
| MULTI RATIO ROUTING | | | | | | | | | | |
| A1 | | | | | | | | | | |
| A2 | | | | | | | | | | |
| A3 | | | | | | | | | | |
| B | 300 | | | | | | | 0 | 0 | 3 |
| B1 | | | | | | | | | | |
| J | 1 | | | | | | | | | |
| J1 | 0.5 | 0.3 | 0.15 | 0.1 | 0.05 | | | | | |
| K | | | | | | | | | | |
| K1 | | | | | | | | | | |
| L | | | | | | | | | | |
| L1 | 1 | 2 | 1.0 | 1.0 | 1.0 | | | | | 1 |
| M | 0 | 25 | 100 | 109 | 117 | | | | | |
| T | | | | | | | | 1.5 | 0.15 | |
| M2 | | | | | | | | | | |
| X | -1.0 | 0.42 | | | | | | | | |
| X1 | 1 | -0.05 | 2.0 | | | | | 0 | 0 | 1 |
| K1 | | | | | | | | | | |
| Y | | | | | | | | | | |
| Y1 | 1 | | | | | | | | | |
| Y4 | 796.5 | 757 | 799 | 801 | 802 | 803 | 804 | 805 | 805 | |
| Y5 | | 4 | 232 | 636 | 858 | 1112 | 1382 | 1649 | | |
| Y6 | | 190 | 294 | 420 | | | | | | |
| Y7 | | 787 | 797 | 800 | 820 | | | | | |
| Y8 | 796.5 | | | | | | | | | |
| Y9 | 802 | 2.63 | 1.5 | 1252 | | | | | | |
| K1 | | | | | | | | | | |
| L | | | | | | | | | | |
| L1 | 1 | | | | | | | | | |
| M | 0 | 25 | 100 | 109 | 117 | | | | | 1 |
| T | | | | | | | | 1.5 | 0.15 | |
| M2 | | | | | | | | | | |
| X | -1.0 | 0.66 | | | | | | | | |
| X1 | 2 | -0.05 | 2.0 | | | | | 0 | 0 | 1 |
| K1 | | | | | | | | | | |
| L | | | | | | | | | | |
| L1 | 1 | | | | | | | | | |
| Y | | | | | | | | | | |
| Y1 | 1 | | | | | | | | | |
| Y4 | 752.7 | 753.7 | 754.7 | 755.7 | 755.7 | 757.7 | | | | |
| Y5 | | 76 | 216 | 396 | 510 | 853 | | | | |
| Y6 | | 137 | 184 | | | | | | | |
| Y7 | | 746 | 760 | | | | | | | |
| Y8 | 752.7 | 753 | | | | | | | | |
| Y9 | 753.7 | 2.63 | 1.5 | 300 | | | | | | |
| K1 | | | | | | | | | | |
| L | | | | | | | | | | |
| L1 | | | | | | | | | | |
| L2 | | | | | | | | | | |
| L3 | | | | | | | | | | |
| L4 | | | | | | | | | | |
| L5 | | | | | | | | | | |
| L6 | | | | | | | | | | |
| L7 | | | | | | | | | | |
| L8 | | | | | | | | | | |
| L9 | | | | | | | | | | |
| L10 | | | | | | | | | | |
| L11 | | | | | | | | | | |
| L12 | | | | | | | | | | |
| L13 | | | | | | | | | | |
| L14 | | | | | | | | | | |
| L15 | | | | | | | | | | |
| L16 | | | | | | | | | | |
| L17 | | | | | | | | | | |
| L18 | | | | | | | | | | |
| L19 | | | | | | | | | | |
| L20 | | | | | | | | | | |
| L21 | | | | | | | | | | |
| L22 | | | | | | | | | | |
| L23 | | | | | | | | | | |
| L24 | | | | | | | | | | |
| L25 | | | | | | | | | | |
| L26 | | | | | | | | | | |
| L27 | | | | | | | | | | |
| L28 | | | | | | | | | | |
| L29 | | | | | | | | | | |
| L30 | | | | | | | | | | |
| L31 | | | | | | | | | | |
| L32 | | | | | | | | | | |
| L33 | | | | | | | | | | |
| L34 | | | | | | | | | | |
| L35 | | | | | | | | | | |
| L36 | | | | | | | | | | |
| L37 | | | | | | | | | | |
| L38 | | | | | | | | | | |
| L39 | | | | | | | | | | |
| L40 | | | | | | | | | | |
| L41 | | | | | | | | | | |
| L42 | | | | | | | | | | |
| L43 | | | | | | | | | | |
| L44 | | | | | | | | | | |
| L45 | | | | | | | | | | |
| L46 | | | | | | | | | | |
| L47 | | | | | | | | | | |
| L48 | | | | | | | | | | |
| L49 | | | | | | | | | | |
| L50 | | | | | | | | | | |
| L51 | | | | | | | | | | |
| L52 | | | | | | | | | | |
| L53 | | | | | | | | | | |
| L54 | | | | | | | | | | |
| L55 | | | | | | | | | | |
| L56 | | | | | | | | | | |
| L57 | | | | | | | | | | |
| L58 | | | | | | | | | | |
| L59 | | | | | | | | | | |
| L60 | | | | | | | | | | |
| L61 | | | | | | | | | | |
| L62 | | | | | | | | | | |
| L63 | | | | | | | | | | |
| L64 | | | | | | | | | | |
| L65 | | | | | | | | | | |
| L66 | | | | | | | | | | |
| L67 | | | | | | | | | | |
| L68 | | | | | | | | | | |
| L69 | | | | | | | | | | |
| L70 | | | | | | | | | | |
| L71 | | | | | | | | | | |
| L72 | | | | | | | | | | |
| L73 | | | | | | | | | | |
| L74 | | | | | | | | | | |
| L75 | | | | | | | | | | |
| L76 | | | | | | | | | | |
| L77 | | | | | | | | | | |
| L78 | | | | | | | | | | |
| L79 | | | | | | | | | | |
| L80 | | | | | | | | | | |
| L81 | | | | | | | | | | |
| L82 | | | | | | | | | | |
| L83 | | | | | | | | | | |
| L84 | | | | | | | | | | |
| L85 | | | | | | | | | | |
| L86 | | | | | | | | | | |
| L87 | | | | | | | | | | |
| L88 | | | | | | | | | | |
| L89 | | | | | | | | | | |
| L90 | | | | | | | | | | |
| L91 | | | | | | | | | | |
| L92 | | | | | | | | | | |
| L93 | | | | | | | | | | |
| L94 | | | | | | | | | | |
| L95 | | | | | | | | | | |
| L96 | | | | | | | | | | |
| L97 | | | | | | | | | | |
| L98 | | | | | | | | | | |
| L99 | | | | | | | | | | |

THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDC
 CITY PRACTICABLE
 FROM COPY FURNISHED TO DDC

SUMMARY OF DAM SAFETY ANALYSIS *MT. HOPE LAKE*

| ELEVATION | | INITIAL VALUE | SPILLWAY CREST | TOP OF DAM | | | |
|--------------|-----------------------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| STORAGE | | 797.00 | 796.50 | 802.00 | | | |
| OUTFLOW | | 633.4. | 543.0. | 1953.858. | | | |
| RATIO OF PMF | MAXIMUM RESERVOIR W.S. ELEV | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM OUTFLOW CFS | DURATION OVER TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
| .50 | 800.42 | 0.00 | 1478. | 519. | 0.00 | 18.58 | 0.00 |
| .30 | 799.25 | 0.00 | 1143. | 282. | 0.00 | 18.58 | 0.00 |
| .15 | 798.20 | 0.00 | 895. | 141. | 0.00 | 18.58 | 0.00 |
| .10 | 797.82 | 0.00 | 799. | 97. | 0.00 | 18.58 | 0.00 |
| .05 | 797.41 | 0.00 | 713. | 50. | 0.00 | 18.58 | 0.00 |

SUMMARY OF DAM SAFETY ANALYSIS *WHITE MEADOW LAKE*

| ELEVATION | | INITIAL VALUE | SPILLWAY CREST | TOP OF DAM | | | |
|--------------|-----------------------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| STORAGE | | 753.00 | 752.70 | 753.70 | | | |
| OUTFLOW | | 320.23. | 280.0. | 417.76. | | | |
| RATIO OF PMF | MAXIMUM RESERVOIR W.S. ELEV | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM OUTFLOW CFS | DURATION OVER TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
| .50 | 755.08 | 1.38 | 518. | 1556. | 10.42 | 17.25 | 0.00 |
| .30 | 754.49 | .79 | 531. | 746. | 9.42 | 17.83 | 0.00 |
| .15 | 753.97 | .27 | 456. | 228. | 8.33 | 18.83 | 0.00 |
| .10 | 753.72 | .02 | 421. | 82. | 5.17 | 23.33 | 0.00 |
| .05 | 753.28 | 0.00 | 359. | 44. | 0.00 | 22.50 | 0.00 |

THIS PAGE IS BEST QUALITY PRACTICABLE
 A COPY FURNISHED TO DDC

1/2 PMF ROUTING
(WITH BREACH)

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

| | |
|--------------------------|------|
| RUNOFF HYDROGRAPH AT | LAKE |
| ROUTE HYDROGRAPH TO | DAM |
| RUNOFF HYDROGRAPH AT | WML |
| COMBINE 2 HYDROGRAPHS AT | WML |
| ROUTE HYDROGRAPH TO | WML |
| ROUTE HYDROGRAPH TO | 1 |
| ROUTE HYDROGRAPH TO | 2 |
| END OF NETWORK | |

THIS PAGE IS BEST QUALITY PRACTICABLE
FOR COPY FURNISHED TO DDC

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

RJV DATE# 79/06/22*
 TIME# 10.39.17*

DAM SAFETY ANALYSIS, NEW JERSEY
 MT HOPE / WHITE MEADOW LAKE DAM
 MULTI, RATIO ROUTING

NO 300 NHR 0 NWIN 5 IDAY 0 JOPER 5
 JOB SPECIFICATION
 IHR 0 IMIN 0 METRC 0 IPLT 0 IPRT 3 NSTAN 0
 NWT 0 LROPT 0 TRACE 0

RTIOS= .50 .30 .15 .10 .05
 MULTI-PLAN ANALYSES TO BE PERFORMED
 NPLAN= 1 NRTIO= 5 LRTIO= 1

***** SUB-AREA RUN-OFF COMPUTATION *****

SUBAREA INFLOW HYDROGRAPH TO MT HOPE LAKE

ISTAG ICOMP IECON ITAPE JPLT JPR1 INAME ISTAGE IAUTO
 LAKE 0 0 0 0 0 0 1 0 0
 IHYD1 IUNG 2 TAREA 1.90 SNAP 0.00 TRSQA TRSQC 0.000 ISNOW 0 ISAME 1 LOCAL 0
 RATIO 0.000 R48 R72 R96
 0.00 109.00 117.00 0.00 0.00 0.00

PRECIP DATA
 R12 R24
 0.00 0.00
 TRSQC COMPUTED BY THE PROGRAM IS .800

LOCSS DATA
 STRKS 0.00 RTICK 1.00 STRIL CNSTL 1.50 AFSM 0.00 RTIMP 0.00
 LROPT 0 STRKR 0.00 CLTKS 0.00 RTIOL 1.00 ERAIN 0.00
 UNIT HYDROGRAPH DATA
 TC= 0.00 LAGE .42

RECESSION DATA
 STRTQ= -1.00 GRCSN= -.05 RTIOR= 2.00
 UNIT HYDROGRAPH 27 END OF PERIOD ORDINATES, TCE 0.00 HOURS, LAGE .42 VOL= 1.00 768.
 171. 523. 1090. 1576. 1946. 1969.
 570. 430. 320. 241. 180. 130. 74. 1063. 1063.
 30. 423. 19. 24. 10. 10. 39. 74. 55. 61.

THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDC

PMF INFLOW HYDROGRAPH

| MO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP C |
|--------|--------|--------|------|------|------|--------|
| 1.01 | .05 | 1 | .21 | 0.00 | .01 | 2. |
| 1.01 | .10 | 2 | .01 | 0.00 | .01 | 2. |
| 1.01 | .15 | 3 | .01 | 0.00 | .01 | 2. |
| 1.01 | .20 | 4 | .01 | 0.00 | .01 | 1. |
| 1.01 | .25 | 5 | .01 | 0.00 | .01 | 1. |
| 1.01 | .30 | 6 | .01 | 0.00 | .01 | 1. |
| 1.01 | .35 | 7 | .01 | 0.00 | .01 | 1. |
| 1.01 | .40 | 8 | .01 | 0.00 | .01 | 1. |
| 1.01 | .45 | 9 | .01 | 0.00 | .01 | 1. |
| 1.01 | .50 | 10 | .01 | 0.00 | .01 | 1. |
| 1.01 | .55 | 11 | .01 | 0.00 | .01 | 1. |
| 1.01 | .00 | 12 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.05 | 13 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.10 | 14 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.15 | 15 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.20 | 16 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.25 | 17 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.30 | 18 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.35 | 19 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.40 | 20 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.45 | 21 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.50 | 22 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.55 | 23 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.00 | 24 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.05 | 25 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.10 | 26 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.15 | 27 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.20 | 28 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.25 | 29 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.30 | 30 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.35 | 31 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.40 | 32 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.45 | 33 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.50 | 34 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.55 | 35 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.00 | 36 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.05 | 37 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.10 | 38 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.15 | 39 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.20 | 40 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.25 | 41 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.30 | 42 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.35 | 43 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.40 | 44 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.45 | 45 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.50 | 46 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.55 | 47 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.00 | 48 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.05 | 49 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.10 | 50 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.15 | 51 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.20 | 52 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.25 | 53 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.30 | 54 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.35 | 55 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.40 | 56 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.45 | 57 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.50 | 58 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.55 | 59 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.00 | 60 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.05 | 61 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.10 | 62 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.15 | 63 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.20 | 64 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.25 | 65 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.30 | 66 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.35 | 67 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.40 | 68 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.45 | 69 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.50 | 70 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.55 | 71 | .01 | 0.00 | .01 | 1. |
| 1.01 | 6.00 | 72 | .01 | 0.00 | .01 | 1. |
| 1.01 | 6.05 | 73 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.10 | 74 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.15 | 75 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.20 | 76 | .03 | 0.00 | .03 | 1. |

MO. DA HR. MN PERIOD RAIN EXCS LOSS COMP 0

| MO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP | 0 |
|--------|--------|--------|------|------|------|------|----|
| 1.01 | 6.25 | 77 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 6.30 | 78 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 6.35 | 79 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 6.40 | 80 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 6.45 | 81 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 6.50 | 82 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 6.55 | 83 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.00 | 84 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.05 | 85 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.10 | 86 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.15 | 87 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.20 | 88 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.25 | 89 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.30 | 90 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.35 | 91 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.40 | 92 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.45 | 93 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.50 | 94 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 7.55 | 95 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.00 | 96 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.05 | 97 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.10 | 98 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.15 | 99 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.20 | 100 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.25 | 101 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.30 | 102 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.35 | 103 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.40 | 104 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.45 | 105 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.50 | 106 | .03 | 0.00 | .03 | | 0. |
| 1.01 | 8.55 | 107 | .03 | 0.01 | .02 | | 1. |
| 1.01 | 9.00 | 108 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.05 | 109 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.10 | 110 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.15 | 111 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.20 | 112 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.25 | 113 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.30 | 114 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.35 | 115 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.40 | 116 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.45 | 117 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.50 | 118 | .03 | .01 | .01 | | 1. |
| 1.01 | 9.55 | 119 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.00 | 120 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.05 | 121 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.10 | 122 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.15 | 123 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.20 | 124 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.25 | 125 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.30 | 126 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.35 | 127 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.40 | 128 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.45 | 129 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.50 | 130 | .03 | .01 | .01 | | 1. |
| 1.01 | 10.55 | 131 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.00 | 132 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.05 | 133 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.10 | 134 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.15 | 135 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.20 | 136 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.25 | 137 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.30 | 138 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.35 | 139 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.40 | 140 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.45 | 141 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.50 | 142 | .03 | .01 | .01 | | 1. |
| 1.01 | 11.55 | 143 | .03 | .01 | .01 | | 1. |
| 1.01 | 12.00 | 144 | .03 | .01 | .01 | | 1. |
| 1.01 | 12.05 | 145 | .17 | .15 | .01 | | 1. |
| 1.01 | 12.10 | 146 | .17 | .15 | .01 | | 1. |
| 1.01 | 12.15 | 147 | .17 | .15 | .01 | | 1. |
| 1.01 | 12.20 | 148 | .17 | .15 | .01 | | 1. |
| 1.01 | 12.25 | 149 | .17 | .15 | .01 | | 1. |
| 1.01 | 12.30 | 150 | .17 | .15 | .01 | | 1. |

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

| | | | | | | |
|------|-------|-----|-----|-----|-----|------|
| 1.01 | 11.55 | 227 | .01 | .00 | .01 | 495. |
| 1.01 | 11.56 | 228 | .01 | .00 | .01 | 442. |
| 1.01 | 11.57 | 229 | .01 | .00 | .01 | 431. |
| 1.01 | 11.58 | 230 | .01 | .00 | .01 | 402. |
| 1.01 | 11.59 | 231 | .01 | .00 | .01 | 375. |
| 1.01 | 11.59 | 232 | .01 | .00 | .01 | 355. |
| 1.01 | 11.59 | 233 | .01 | .00 | .01 | 326. |
| 1.01 | 11.59 | 234 | .01 | .00 | .01 | 305. |
| 1.01 | 11.59 | 235 | .01 | .00 | .01 | 284. |
| 1.01 | 11.59 | 236 | .01 | .00 | .01 | 265. |
| 1.01 | 11.59 | 237 | .01 | .00 | .01 | 247. |
| 1.01 | 11.59 | 238 | .01 | .00 | .01 | 231. |
| 1.01 | 11.59 | 239 | .01 | .00 | .01 | 215. |
| 1.01 | 11.59 | 240 | .01 | .00 | .01 | 201. |
| 1.01 | 11.59 | 241 | .01 | .00 | .01 | 187. |
| 1.01 | 11.59 | 242 | .01 | .00 | .01 | 175. |
| 1.01 | 11.59 | 243 | .01 | .00 | .01 | 163. |
| 1.01 | 11.59 | 244 | .01 | .00 | .01 | 151. |
| 1.01 | 11.59 | 245 | .01 | .00 | .01 | 138. |
| 1.01 | 11.59 | 246 | .01 | .00 | .01 | 124. |
| 1.01 | 11.59 | 247 | .01 | .00 | .01 | 110. |
| 1.01 | 11.59 | 248 | .01 | .00 | .01 | 96. |
| 1.01 | 11.59 | 249 | .01 | .00 | .01 | 82. |
| 1.01 | 11.59 | 250 | .01 | .00 | .01 | 68. |
| 1.01 | 11.59 | 251 | .01 | .00 | .01 | 54. |
| 1.01 | 11.59 | 252 | .01 | .00 | .01 | 40. |
| 1.01 | 11.59 | 253 | .01 | .00 | .01 | 26. |
| 1.01 | 11.59 | 254 | .01 | .00 | .01 | 12. |
| 1.01 | 11.59 | 255 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 256 | .01 | .00 | .01 | 66. |
| 1.01 | 11.59 | 257 | .01 | .00 | .01 | 62. |
| 1.01 | 11.59 | 258 | .01 | .00 | .01 | 58. |
| 1.01 | 11.59 | 259 | .01 | .00 | .01 | 54. |
| 1.01 | 11.59 | 260 | .01 | .00 | .01 | 50. |
| 1.01 | 11.59 | 261 | .01 | .00 | .01 | 47. |
| 1.01 | 11.59 | 262 | .01 | .00 | .01 | 44. |
| 1.01 | 11.59 | 263 | .01 | .00 | .01 | 41. |
| 1.01 | 11.59 | 264 | .01 | .00 | .01 | 38. |
| 1.01 | 11.59 | 265 | .01 | .00 | .01 | 36. |
| 1.01 | 11.59 | 266 | .01 | .00 | .01 | 34. |
| 1.01 | 11.59 | 267 | .01 | .00 | .01 | 31. |
| 1.01 | 11.59 | 268 | .01 | .00 | .01 | 29. |
| 1.01 | 11.59 | 269 | .01 | .00 | .01 | 27. |
| 1.01 | 11.59 | 270 | .01 | .00 | .01 | 25. |
| 1.01 | 11.59 | 271 | .01 | .00 | .01 | 23. |
| 1.01 | 11.59 | 272 | .01 | .00 | .01 | 21. |
| 1.01 | 11.59 | 273 | .01 | .00 | .01 | 19. |
| 1.01 | 11.59 | 274 | .01 | .00 | .01 | 17. |
| 1.01 | 11.59 | 275 | .01 | .00 | .01 | 15. |
| 1.01 | 11.59 | 276 | .01 | .00 | .01 | 13. |
| 1.01 | 11.59 | 277 | .01 | .00 | .01 | 11. |
| 1.01 | 11.59 | 278 | .01 | .00 | .01 | 9. |
| 1.01 | 11.59 | 279 | .01 | .00 | .01 | 7. |
| 1.01 | 11.59 | 280 | .01 | .00 | .01 | 5. |
| 1.01 | 11.59 | 281 | .01 | .00 | .01 | 3. |
| 1.01 | 11.59 | 282 | .01 | .00 | .01 | 1. |
| 1.01 | 11.59 | 283 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 284 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 285 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 286 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 287 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 288 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 289 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 290 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 291 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 292 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 293 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 294 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 295 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 296 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 297 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 298 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 299 | .01 | .00 | .01 | 0. |
| 1.01 | 11.59 | 300 | .01 | .00 | .01 | 0. |

SUM 23.40 19.63 3.77 294370.
 (594.6) (499.6) (96.6) (8335.63)

MO. DA HR. MN PERIOD RAIN EXCS LOSS COMP Q

| | | | | | | |
|------|-------|-----|------|------|------|------|
| 1.01 | 18.55 | 227 | .01 | .00 | .01 | 4.95 |
| 1.01 | 19.00 | 228 | .01 | .00 | .01 | 4.62 |
| 1.01 | 19.05 | 229 | .01 | .00 | .01 | 4.31 |
| 1.01 | 19.10 | 230 | .01 | .00 | .01 | 4.02 |
| 1.01 | 19.15 | 231 | .01 | .00 | .01 | 3.75 |
| 1.01 | 19.20 | 232 | .01 | .00 | .01 | 3.50 |
| 1.01 | 19.25 | 233 | .01 | .00 | .01 | 3.26 |
| 1.01 | 19.30 | 234 | .01 | .00 | .01 | 3.05 |
| 1.01 | 19.35 | 235 | .01 | .00 | .01 | 2.84 |
| 1.01 | 19.40 | 236 | .01 | .00 | .01 | 2.65 |
| 1.01 | 19.45 | 237 | .01 | .00 | .01 | 2.47 |
| 1.01 | 19.50 | 238 | .01 | .00 | .01 | 2.31 |
| 1.01 | 19.55 | 239 | .01 | .00 | .01 | 2.15 |
| 1.01 | 20.00 | 240 | .01 | .00 | .01 | 2.01 |
| 1.01 | 20.05 | 241 | .01 | .00 | .01 | 1.87 |
| 1.01 | 20.10 | 242 | .01 | .00 | .01 | 1.75 |
| 1.01 | 20.15 | 243 | .01 | .00 | .01 | 1.63 |
| 1.01 | 20.20 | 244 | .01 | .00 | .01 | 1.52 |
| 1.01 | 20.25 | 245 | .01 | .00 | .01 | 1.42 |
| 1.01 | 20.30 | 246 | .01 | .00 | .01 | 1.33 |
| 1.01 | 20.35 | 247 | .01 | .00 | .01 | 1.24 |
| 1.01 | 20.40 | 248 | .01 | .00 | .01 | 1.15 |
| 1.01 | 20.45 | 249 | .01 | .00 | .01 | 1.08 |
| 1.01 | 20.50 | 250 | .01 | .00 | .01 | 1.00 |
| 1.01 | 20.55 | 251 | .01 | .00 | .01 | .94 |
| 1.01 | 21.00 | 252 | .01 | .00 | .01 | .87 |
| 1.01 | 21.05 | 253 | .01 | .00 | .01 | .82 |
| 1.01 | 21.10 | 254 | .01 | .00 | .01 | .76 |
| 1.01 | 21.15 | 255 | .01 | .00 | .01 | .71 |
| 1.01 | 21.20 | 256 | .01 | .00 | .01 | .66 |
| 1.01 | 21.25 | 257 | .01 | .00 | .01 | .62 |
| 1.01 | 21.30 | 258 | .01 | .00 | .01 | .58 |
| 1.01 | 21.35 | 259 | .01 | .00 | .01 | .54 |
| 1.01 | 21.40 | 260 | .01 | .00 | .01 | .50 |
| 1.01 | 21.45 | 261 | .01 | .00 | .01 | .47 |
| 1.01 | 21.50 | 262 | .01 | .00 | .01 | .44 |
| 1.01 | 21.55 | 263 | .01 | .00 | .01 | .41 |
| 1.01 | 22.00 | 264 | .01 | .00 | .01 | .38 |
| 1.01 | 22.05 | 265 | .01 | .00 | .01 | .36 |
| 1.01 | 22.10 | 266 | .01 | .00 | .01 | .33 |
| 1.01 | 22.15 | 267 | .01 | .00 | .01 | .31 |
| 1.01 | 22.20 | 268 | .01 | .00 | .01 | .29 |
| 1.01 | 22.25 | 269 | .01 | .00 | .01 | .27 |
| 1.01 | 22.30 | 270 | .01 | .00 | .01 | .25 |
| 1.01 | 22.35 | 271 | .01 | .00 | .01 | .24 |
| 1.01 | 22.40 | 272 | .01 | .00 | .01 | .22 |
| 1.01 | 22.45 | 273 | .01 | .00 | .01 | .20 |
| 1.01 | 22.50 | 274 | .01 | .00 | .01 | .19 |
| 1.01 | 22.55 | 275 | .01 | .00 | .01 | .18 |
| 1.01 | 23.00 | 276 | .01 | .00 | .01 | .17 |
| 1.01 | 23.05 | 277 | .01 | .00 | .01 | .15 |
| 1.01 | 23.10 | 278 | .01 | .00 | .01 | .14 |
| 1.01 | 23.15 | 279 | .01 | .00 | .01 | .13 |
| 1.01 | 23.20 | 280 | .01 | .00 | .01 | .12 |
| 1.01 | 23.25 | 281 | .01 | .00 | .01 | .11 |
| 1.01 | 23.30 | 282 | .01 | .00 | .01 | .11 |
| 1.01 | 23.35 | 283 | .01 | .00 | .01 | .11 |
| 1.01 | 23.40 | 284 | .01 | .00 | .01 | .11 |
| 1.01 | 23.45 | 285 | .01 | .00 | .01 | .11 |
| 1.01 | 23.50 | 286 | .01 | .00 | .01 | .11 |
| 1.01 | 23.55 | 287 | .01 | .00 | .01 | .12 |
| 1.01 | 00.00 | 288 | .01 | .00 | .01 | .12 |
| 1.02 | 00.05 | 289 | 0.00 | 0.00 | 0.00 | .12 |
| 1.02 | 00.10 | 290 | 0.00 | 0.00 | 0.00 | .12 |
| 1.02 | 00.15 | 291 | 0.00 | 0.00 | 0.00 | .11 |
| 1.02 | 00.20 | 292 | 0.00 | 0.00 | 0.00 | .10 |
| 1.02 | 00.25 | 293 | 0.00 | 0.00 | 0.00 | .09 |
| 1.02 | 00.30 | 294 | 0.00 | 0.00 | 0.00 | .09 |
| 1.02 | 00.35 | 295 | 0.00 | 0.00 | 0.00 | .08 |
| 1.02 | 00.40 | 296 | 0.00 | 0.00 | 0.00 | .08 |
| 1.02 | 00.45 | 297 | 0.00 | 0.00 | 0.00 | .07 |
| 1.02 | 00.50 | 298 | 0.00 | 0.00 | 0.00 | .07 |
| 1.02 | 00.55 | 299 | 0.00 | 0.00 | 0.00 | .06 |
| 1.02 | 01.00 | 300 | 0.00 | 0.00 | 0.00 | .06 |

SUM 23.40 19.63 3.77 294370
 (594.) (499.) (96.) (8335.63)

PMF SUB-AREA INFLOW

| MO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP Q |
|--------|--------|--------|------|------|------|--------|
| 1.01 | .05 | 1 | .01 | 0.00 | .01 | 1. |
| 1.01 | .10 | 2 | .01 | 0.00 | .01 | 1. |
| 1.01 | .15 | 3 | .01 | 0.00 | .01 | 1. |
| 1.01 | .20 | 4 | .01 | 0.00 | .01 | 1. |
| 1.01 | .25 | 5 | .01 | 0.00 | .01 | 1. |
| 1.01 | .30 | 6 | .01 | 0.00 | .01 | 1. |
| 1.01 | .35 | 7 | .01 | 0.00 | .01 | 1. |
| 1.01 | .40 | 8 | .01 | 0.00 | .01 | 1. |
| 1.01 | .45 | 9 | .01 | 0.00 | .01 | 1. |
| 1.01 | .50 | 10 | .01 | 0.00 | .01 | 1. |
| 1.01 | .55 | 11 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.00 | 12 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.05 | 13 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.10 | 14 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.15 | 15 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.20 | 16 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.25 | 17 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.30 | 18 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.35 | 19 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.40 | 20 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.45 | 21 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.50 | 22 | .01 | 0.00 | .01 | 1. |
| 1.01 | 1.55 | 23 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.00 | 24 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.05 | 25 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.10 | 26 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.15 | 27 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.20 | 28 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.25 | 29 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.30 | 30 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.35 | 31 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.40 | 32 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.45 | 33 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.50 | 34 | .01 | 0.00 | .01 | 1. |
| 1.01 | 2.55 | 35 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.00 | 36 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.05 | 37 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.10 | 38 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.15 | 39 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.20 | 40 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.25 | 41 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.30 | 42 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.35 | 43 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.40 | 44 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.45 | 45 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.50 | 46 | .01 | 0.00 | .01 | 1. |
| 1.01 | 3.55 | 47 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.00 | 48 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.05 | 49 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.10 | 50 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.15 | 51 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.20 | 52 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.25 | 53 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.30 | 54 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.35 | 55 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.40 | 56 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.45 | 57 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.50 | 58 | .01 | 0.00 | .01 | 1. |
| 1.01 | 4.55 | 59 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.00 | 60 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.05 | 61 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.10 | 62 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.15 | 63 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.20 | 64 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.25 | 65 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.30 | 66 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.35 | 67 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.40 | 68 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.45 | 69 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.50 | 70 | .01 | 0.00 | .01 | 1. |
| 1.01 | 5.55 | 71 | .01 | 0.00 | .01 | 1. |
| 1.01 | 6.00 | 72 | .01 | 0.00 | .01 | 1. |
| 1.01 | 6.05 | 73 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.10 | 74 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.15 | 75 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.20 | 76 | .03 | 0.00 | .03 | 1. |
| 1.01 | 6.25 | 77 | .03 | 0.00 | .03 | 1. |

| MO. DA | HR. MN | PERIOD | RAIN | EXCS | LOSS | COMP | Q |
|--------|--------|--------|------|------|------|------|---|
| 1.01 | 12.35 | 151 | .17 | .15 | .01 | 418 | . |
| 1.01 | 12.40 | 152 | .17 | .15 | .01 | 512 | . |
| 1.01 | 12.45 | 153 | .17 | .15 | .01 | 610 | . |
| 1.01 | 12.50 | 154 | .17 | .15 | .01 | 708 | . |
| 1.01 | 12.55 | 155 | .17 | .15 | .01 | 806 | . |
| 1.01 | 13.00 | 156 | .17 | .15 | .01 | 904 | . |
| 1.01 | 13.05 | 157 | .20 | .19 | .01 | 974 | . |
| 1.01 | 13.10 | 158 | .20 | .19 | .01 | 1044 | . |
| 1.01 | 13.15 | 159 | .20 | .19 | .01 | 1114 | . |
| 1.01 | 13.20 | 160 | .20 | .19 | .01 | 1184 | . |
| 1.01 | 13.25 | 161 | .20 | .19 | .01 | 1254 | . |
| 1.01 | 13.30 | 162 | .20 | .19 | .01 | 1324 | . |
| 1.01 | 13.35 | 163 | .20 | .19 | .01 | 1394 | . |
| 1.01 | 13.40 | 164 | .20 | .19 | .01 | 1464 | . |
| 1.01 | 13.45 | 165 | .20 | .19 | .01 | 1534 | . |
| 1.01 | 13.50 | 166 | .20 | .19 | .01 | 1604 | . |
| 1.01 | 13.55 | 167 | .20 | .19 | .01 | 1674 | . |
| 1.01 | 14.00 | 168 | .20 | .19 | .01 | 1744 | . |
| 1.01 | 14.05 | 169 | .25 | .24 | .01 | 1814 | . |
| 1.01 | 14.10 | 170 | .25 | .24 | .01 | 1884 | . |
| 1.01 | 14.15 | 171 | .25 | .24 | .01 | 1954 | . |
| 1.01 | 14.20 | 172 | .25 | .24 | .01 | 2024 | . |
| 1.01 | 14.25 | 173 | .25 | .24 | .01 | 2094 | . |
| 1.01 | 14.30 | 174 | .25 | .24 | .01 | 2164 | . |
| 1.01 | 14.35 | 175 | .25 | .24 | .01 | 2234 | . |
| 1.01 | 14.40 | 176 | .25 | .24 | .01 | 2304 | . |
| 1.01 | 14.45 | 177 | .25 | .24 | .01 | 2374 | . |
| 1.01 | 14.50 | 178 | .25 | .24 | .01 | 2444 | . |
| 1.01 | 14.55 | 179 | .25 | .24 | .01 | 2514 | . |
| 1.01 | 15.00 | 180 | .25 | .24 | .01 | 2584 | . |
| 1.01 | 15.05 | 181 | .15 | .14 | .01 | 2654 | . |
| 1.01 | 15.10 | 182 | .30 | .29 | .01 | 2724 | . |
| 1.01 | 15.15 | 183 | .30 | .29 | .01 | 2794 | . |
| 1.01 | 15.20 | 184 | .46 | .44 | .01 | 2864 | . |
| 1.01 | 15.25 | 185 | .53 | .52 | .01 | 2934 | . |
| 1.01 | 15.30 | 186 | 1.29 | 1.28 | .01 | 3004 | . |
| 1.01 | 15.35 | 187 | 2.13 | 2.12 | .01 | 3074 | . |
| 1.01 | 15.40 | 188 | .84 | .82 | .01 | 3144 | . |
| 1.01 | 15.45 | 189 | .53 | .52 | .01 | 3214 | . |
| 1.01 | 15.50 | 190 | .46 | .44 | .01 | 3284 | . |
| 1.01 | 15.55 | 191 | .30 | .29 | .01 | 3354 | . |
| 1.01 | 16.00 | 192 | .30 | .29 | .01 | 3424 | . |
| 1.01 | 16.05 | 193 | .23 | .22 | .01 | 3494 | . |
| 1.01 | 16.10 | 194 | .23 | .22 | .01 | 3564 | . |
| 1.01 | 16.15 | 195 | .23 | .22 | .01 | 3634 | . |
| 1.01 | 16.20 | 196 | .23 | .22 | .01 | 3704 | . |
| 1.01 | 16.25 | 197 | .23 | .22 | .01 | 3774 | . |
| 1.01 | 16.30 | 198 | .23 | .22 | .01 | 3844 | . |
| 1.01 | 16.35 | 199 | .23 | .22 | .01 | 3914 | . |
| 1.01 | 16.40 | 200 | .23 | .22 | .01 | 3984 | . |
| 1.01 | 16.45 | 201 | .23 | .22 | .01 | 4054 | . |
| 1.01 | 16.50 | 202 | .23 | .22 | .01 | 4124 | . |
| 1.01 | 16.55 | 203 | .23 | .22 | .01 | 4194 | . |
| 1.01 | 17.00 | 204 | .23 | .22 | .01 | 4264 | . |
| 1.01 | 17.05 | 205 | .18 | .17 | .01 | 4334 | . |
| 1.01 | 17.10 | 206 | .18 | .17 | .01 | 4404 | . |
| 1.01 | 17.15 | 207 | .18 | .17 | .01 | 4474 | . |
| 1.01 | 17.20 | 208 | .18 | .17 | .01 | 4544 | . |
| 1.01 | 17.25 | 209 | .18 | .17 | .01 | 4614 | . |
| 1.01 | 17.30 | 210 | .18 | .17 | .01 | 4684 | . |
| 1.01 | 17.35 | 211 | .18 | .17 | .01 | 4754 | . |
| 1.01 | 17.40 | 212 | .18 | .17 | .01 | 4824 | . |
| 1.01 | 17.45 | 213 | .18 | .17 | .01 | 4894 | . |
| 1.01 | 17.50 | 214 | .18 | .17 | .01 | 4964 | . |
| 1.01 | 17.55 | 215 | .18 | .17 | .01 | 5034 | . |
| 1.01 | 18.00 | 216 | .19 | .17 | .01 | 5104 | . |
| 1.01 | 18.05 | 217 | .01 | .00 | .01 | 5174 | . |
| 1.01 | 18.10 | 218 | .01 | .00 | .01 | 5244 | . |
| 1.01 | 18.15 | 219 | .01 | .00 | .01 | 5314 | . |
| 1.01 | 18.20 | 220 | .01 | .00 | .01 | 5384 | . |
| 1.01 | 18.25 | 221 | .01 | .00 | .01 | 5454 | . |
| 1.01 | 18.30 | 222 | .01 | .00 | .01 | 5524 | . |
| 1.01 | 18.35 | 223 | .01 | .00 | .01 | 5594 | . |
| 1.01 | 18.40 | 224 | .01 | .00 | .01 | 5664 | . |
| 1.01 | 18.45 | 225 | .01 | .00 | .01 | 5734 | . |
| 1.01 | 18.50 | 226 | .01 | .00 | .01 | 5804 | . |
| 1.01 | 18.55 | 227 | .01 | .00 | .01 | 5874 | . |

THIS PAGE IS BEST QUALITY PRINTING
FROM COPY FURNISHED TO DDC

NO.0A C HR.MN PERIOD RAIN EXCS LOSS COMP 0

| NO.0A | C | HR.MN | PERIOD | RAIN | EXCS | LOSS | COMP 0 |
|-------|---|-------|--------|------|------|------|--------|
| 1.01 | 1 | 19.00 | 2228 | .01 | .00 | .01 | 420. |
| 1.01 | 1 | 19.05 | 2229 | .01 | .00 | .01 | 433. |
| 1.01 | 1 | 19.10 | 2230 | .01 | .00 | .01 | 2233. |
| 1.01 | 1 | 19.15 | 2231 | .01 | .00 | .01 | 2238. |
| 1.01 | 1 | 19.20 | 2232 | .01 | .00 | .01 | 2243. |
| 1.01 | 1 | 19.25 | 2233 | .01 | .00 | .01 | 2248. |
| 1.01 | 1 | 19.30 | 2234 | .01 | .00 | .01 | 1644. |
| 1.01 | 1 | 19.35 | 2235 | .01 | .00 | .01 | 1649. |
| 1.01 | 1 | 19.40 | 2236 | .01 | .00 | .01 | 1654. |
| 1.01 | 1 | 19.45 | 2237 | .01 | .00 | .01 | 1659. |
| 1.01 | 1 | 19.50 | 2238 | .01 | .00 | .01 | 1477. |
| 1.01 | 1 | 19.55 | 2239 | .01 | .00 | .01 | 1377. |
| 1.01 | 1 | 20.00 | 2240 | .01 | .00 | .01 | 1278. |
| 1.01 | 1 | 20.05 | 2241 | .01 | .00 | .01 | 1179. |
| 1.01 | 1 | 20.10 | 2242 | .01 | .00 | .01 | 1111. |
| 1.01 | 1 | 20.15 | 2243 | .01 | .00 | .01 | 1104. |
| 1.01 | 1 | 20.20 | 2244 | .01 | .00 | .01 | 1077. |
| 1.01 | 1 | 20.25 | 2245 | .01 | .00 | .01 | 1050. |
| 1.01 | 1 | 20.30 | 2246 | .01 | .00 | .01 | 1024. |
| 1.01 | 1 | 20.35 | 2247 | .01 | .00 | .01 | 997. |
| 1.01 | 1 | 20.40 | 2248 | .01 | .00 | .01 | 970. |
| 1.01 | 1 | 20.45 | 2249 | .01 | .00 | .01 | 943. |
| 1.01 | 1 | 20.50 | 2250 | .01 | .00 | .01 | 916. |
| 1.01 | 1 | 20.55 | 2251 | .01 | .00 | .01 | 889. |
| 1.01 | 1 | 21.00 | 2252 | .01 | .00 | .01 | 862. |
| 1.01 | 1 | 21.05 | 2253 | .01 | .00 | .01 | 835. |
| 1.01 | 1 | 21.10 | 2254 | .01 | .00 | .01 | 808. |
| 1.01 | 1 | 21.15 | 2255 | .01 | .00 | .01 | 781. |
| 1.01 | 1 | 21.20 | 2256 | .01 | .00 | .01 | 754. |
| 1.01 | 1 | 21.25 | 2257 | .01 | .00 | .01 | 727. |
| 1.01 | 1 | 21.30 | 2258 | .01 | .00 | .01 | 700. |
| 1.01 | 1 | 21.35 | 2259 | .01 | .00 | .01 | 673. |
| 1.01 | 1 | 21.40 | 2260 | .01 | .00 | .01 | 646. |
| 1.01 | 1 | 21.45 | 2261 | .01 | .00 | .01 | 619. |
| 1.01 | 1 | 21.50 | 2262 | .01 | .00 | .01 | 592. |
| 1.01 | 1 | 21.55 | 2263 | .01 | .00 | .01 | 565. |
| 1.01 | 1 | 22.00 | 2264 | .01 | .00 | .01 | 538. |
| 1.01 | 1 | 22.05 | 2265 | .01 | .00 | .01 | 511. |
| 1.01 | 1 | 22.10 | 2266 | .01 | .00 | .01 | 484. |
| 1.01 | 1 | 22.15 | 2267 | .01 | .00 | .01 | 457. |
| 1.01 | 1 | 22.20 | 2268 | .01 | .00 | .01 | 430. |
| 1.01 | 1 | 22.25 | 2269 | .01 | .00 | .01 | 403. |
| 1.01 | 1 | 22.30 | 2270 | .01 | .00 | .01 | 376. |
| 1.01 | 1 | 22.35 | 2271 | .01 | .00 | .01 | 349. |
| 1.01 | 1 | 22.40 | 2272 | .01 | .00 | .01 | 322. |
| 1.01 | 1 | 22.45 | 2273 | .01 | .00 | .01 | 295. |
| 1.01 | 1 | 22.50 | 2274 | .01 | .00 | .01 | 268. |
| 1.01 | 1 | 22.55 | 2275 | .01 | .00 | .01 | 241. |
| 1.01 | 1 | 23.00 | 2276 | .01 | .00 | .01 | 214. |
| 1.01 | 1 | 23.05 | 2277 | .01 | .00 | .01 | 187. |
| 1.01 | 1 | 23.10 | 2278 | .01 | .00 | .01 | 160. |
| 1.01 | 1 | 23.15 | 2279 | .01 | .00 | .01 | 133. |
| 1.01 | 1 | 23.20 | 2280 | .01 | .00 | .01 | 106. |
| 1.01 | 1 | 23.25 | 2281 | .01 | .00 | .01 | 79. |
| 1.01 | 1 | 23.30 | 2282 | .01 | .00 | .01 | 52. |
| 1.01 | 1 | 23.35 | 2283 | .01 | .00 | .01 | 25. |
| 1.01 | 1 | 23.40 | 2284 | .01 | .00 | .01 | 0. |
| 1.01 | 1 | 23.45 | 2285 | .01 | .00 | .01 | 0. |
| 1.01 | 1 | 23.50 | 2286 | .01 | .00 | .01 | 0. |
| 1.01 | 1 | 23.55 | 2287 | .01 | .00 | .01 | 0. |
| 1.01 | 1 | 24.00 | 2288 | .01 | .00 | .01 | 0. |
| 1.02 | 2 | 0.00 | 2289 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.05 | 2290 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.10 | 2291 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.15 | 2292 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.20 | 2293 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.25 | 2294 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.30 | 2295 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.35 | 2296 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.40 | 2297 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.45 | 2298 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.50 | 2299 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 0.55 | 2300 | 0.00 | 0.00 | 0.00 | 0. |
| 1.02 | 2 | 1.00 | 2300 | 0.00 | 0.00 | 0.00 | 0. |

SUM 23.40 19.63 3.77 153814.
 (594.) (499.) (96.) (4355.53)

THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDC

COMBINE HYDROGRAPHS

COMBINE HYDROGRAPHS IN WHITE MEADOW LAKE

| | ISTAQ WML | ICOMP 2 | IECON 0 | ITAPE 0 | JPLT 0 | JPRT 0 | INAME 1 | ISTAGE 0 | IAUTO 0 |
|---|--------------|------------|------------|------------|--------------|-----------|------------|-------------|------------|
| SUM OF 2 HYDROGRAPHS AT WML PLAN 1 RTIO 1 | | | | | | | | | |
| | PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME | | | | |
| CFS | 2757. | 1287. | 455. | 437. | 131061. | | | | |
| CMS | 78. | 36. | 13. | 12. | 3711. | | | | |
| INCHES | | 4.13 | 5.84 | 5.84 | 5.84 | | | | |
| MM | | 104.85 | 148.26 | 148.31 | 148.31 | | | | |
| AC-FT | | 638. | 902. | 903. | 903. | | | | |
| THOUS CU M | | 787. | 1113. | 1113. | 1113. | | | | |

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THRU WHITE MEADOW LAKE DAM

| | ISTAQ WML | ICOMP 1 | IECON 0 | ITAPE 0 | JPLT 0 | JPRT 0 | INAME 1 | ISTAGE 0 | IAUTO 0 |
|--|--------------|------------|------------|------------|-----------|-----------|------------|-------------|------------|
| ROUTING DATA | | | | | | | | | |
| QLOSS | CLOSS | AVG | IRIS | ISAME | IOPT | IPMP | LSTR | | |
| 0.0 | 0.000 | 0.00 | 1 | 1 | 0 | 0 | 0 | | |
| NSTPS NSTDL LAG AMSKK X TSK STORA ISPRAT | | | | | | | | | |
| | 1 | 0 | 0 | 0.000 | 0.000 | 0.000 | -753. | -1 | |
| STAGE | 752.70 | 753.70 | 754.70 | 755.70 | 756.70 | 757.70 | | | |
| FLOW | 0.00 | 76.00 | 216.00 | 396.00 | 610.00 | 853.00 | | | |
| SURFACE AREA= | 0. | 137. | 184. | | | | | | |
| CAPACITY= | 0. | 320. | 1439. | | | | | | |
| ELEVATION= | 746. | 753. | 760. | | | | | | |
| CREL | SPWID | COQW | EXPW | ELEVEL | COQL | CAREA | EXPL | | |
| 752.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| DAM DATA | | | | | | | | | |
| TOPEL | COQD | EXPD | DAMWID | | | | | | |
| 753.7 | 2.6 | 1.5 | 300. | | | | | | |
| DAM BREACH DATA | | | | | | | | | |
| BRWID | ELBM | TFAIL | USEL | FAILEL | | | | | |
| 120. | 2 | 746.00 | .50 | 753.00 | 753.70 | | | | |

| MO.DA | HR.MN | END-OF-PERIOD PERIOD | HYDROGRAPH INFLOW | ORDINATES OUTFLOW | STORAGE | STAGE |
|-------|-------|----------------------|-------------------|-------------------|---------|-------|
| 1.01 | 7.25 | 89 | 7.42 | 4. | 17. | 310. |
| 1.01 | 7.30 | 90 | 7.44 | 4. | 17. | 310. |
| 1.01 | 7.35 | 91 | 7.45 | 4. | 17. | 310. |
| 1.01 | 7.40 | 92 | 7.46 | 4. | 17. | 310. |
| 1.01 | 7.45 | 93 | 7.47 | 4. | 17. | 310. |
| 1.01 | 7.50 | 94 | 7.48 | 4. | 17. | 309. |
| 1.01 | 7.55 | 95 | 7.49 | 4. | 17. | 309. |
| 1.01 | 8.00 | 96 | 7.50 | 4. | 17. | 309. |
| 1.01 | 8.05 | 97 | 7.51 | 4. | 17. | 309. |
| 1.01 | 8.10 | 98 | 7.52 | 4. | 17. | 309. |
| 1.01 | 8.15 | 99 | 7.53 | 4. | 17. | 309. |
| 1.01 | 8.20 | 100 | 7.54 | 4. | 17. | 309. |
| 1.01 | 8.25 | 101 | 7.55 | 4. | 17. | 309. |
| 1.01 | 8.30 | 102 | 7.56 | 4. | 17. | 309. |
| 1.01 | 8.35 | 103 | 7.57 | 4. | 17. | 309. |
| 1.01 | 8.40 | 104 | 7.58 | 4. | 17. | 309. |
| 1.01 | 8.45 | 105 | 7.59 | 4. | 17. | 308. |
| 1.01 | 8.50 | 106 | 7.60 | 4. | 16. | 308. |
| 1.01 | 8.55 | 107 | 7.61 | 4. | 16. | 308. |
| 1.01 | 9.00 | 108 | 7.62 | 4. | 16. | 308. |
| 1.01 | 9.05 | 109 | 7.63 | 5. | 16. | 308. |
| 1.01 | 9.10 | 110 | 7.64 | 7. | 16. | 308. |
| 1.01 | 9.15 | 111 | 7.65 | 9. | 16. | 308. |
| 1.01 | 9.20 | 112 | 7.66 | 13. | 16. | 308. |
| 1.01 | 9.25 | 113 | 7.67 | 16. | 16. | 308. |
| 1.01 | 9.30 | 114 | 7.68 | 21. | 16. | 308. |
| 1.01 | 9.35 | 115 | 7.69 | 25. | 16. | 308. |
| 1.01 | 9.40 | 116 | 7.70 | 29. | 16. | 308. |
| 1.01 | 9.45 | 117 | 7.71 | 33. | 16. | 308. |
| 1.01 | 9.50 | 118 | 7.72 | 37. | 16. | 308. |
| 1.01 | 9.55 | 119 | 7.73 | 40. | 17. | 308. |
| 1.01 | 10.00 | 120 | 7.74 | 42. | 17. | 309. |
| 1.01 | 10.05 | 121 | 7.75 | 45. | 17. | 309. |
| 1.01 | 10.10 | 122 | 7.76 | 47. | 17. | 309. |
| 1.01 | 10.15 | 123 | 7.77 | 48. | 17. | 309. |
| 1.01 | 10.20 | 124 | 7.78 | 50. | 17. | 309. |
| 1.01 | 10.25 | 125 | 7.79 | 51. | 17. | 310. |
| 1.01 | 10.30 | 126 | 7.80 | 52. | 17. | 310. |
| 1.01 | 10.35 | 127 | 7.81 | 53. | 17. | 310. |
| 1.01 | 10.40 | 128 | 7.82 | 54. | 18. | 311. |
| 1.01 | 10.45 | 129 | 7.83 | 55. | 18. | 311. |
| 1.01 | 10.50 | 130 | 7.84 | 56. | 18. | 311. |
| 1.01 | 10.55 | 131 | 7.85 | 57. | 18. | 311. |
| 1.01 | 11.00 | 132 | 7.86 | 58. | 18. | 311. |
| 1.01 | 11.05 | 133 | 7.87 | 59. | 19. | 311. |
| 1.01 | 11.10 | 134 | 7.88 | 59. | 19. | 311. |
| 1.01 | 11.15 | 135 | 7.89 | 60. | 19. | 311. |
| 1.01 | 11.20 | 136 | 7.90 | 60. | 20. | 311. |
| 1.01 | 11.25 | 137 | 7.91 | 61. | 20. | 311. |
| 1.01 | 11.30 | 138 | 7.92 | 61. | 20. | 311. |
| 1.01 | 11.35 | 139 | 7.93 | 64. | 20. | 311. |
| 1.01 | 11.40 | 140 | 7.94 | 71. | 20. | 311. |
| 1.01 | 11.45 | 141 | 7.95 | 84. | 21. | 311. |
| 1.01 | 11.50 | 142 | 7.96 | 106. | 21. | 311. |
| 1.01 | 11.55 | 143 | 7.97 | 139. | 22. | 311. |
| 1.01 | 12.00 | 144 | 7.98 | 182. | 22. | 311. |
| 1.01 | 12.05 | 145 | 7.99 | 231. | 23. | 311. |
| 1.01 | 12.10 | 146 | 8.00 | 282. | 23. | 311. |
| 1.01 | 12.15 | 147 | 8.01 | 334. | 24. | 311. |
| 1.01 | 12.20 | 148 | 8.02 | 383. | 25. | 311. |
| 1.01 | 12.25 | 149 | 8.03 | 429. | 27. | 311. |
| 1.01 | 12.30 | 150 | 8.04 | 470. | 31. | 311. |
| 1.01 | 12.35 | 151 | 8.05 | 505. | 32. | 311. |
| 1.01 | 12.40 | 152 | 8.06 | 534. | 34. | 311. |
| 1.01 | 12.45 | 153 | 8.07 | 561. | 34. | 311. |
| 1.01 | 12.50 | 154 | 8.08 | 586. | 36. | 311. |
| 1.01 | 12.55 | 155 | 8.09 | 611. | 39. | 311. |
| 1.01 | 13.00 | 156 | 8.10 | 636. | 41. | 311. |
| 1.01 | 13.05 | 157 | 8.11 | 661. | 43. | 311. |
| 1.01 | 13.10 | 158 | 8.12 | 685. | 45. | 311. |
| 1.01 | 13.15 | 159 | 8.13 | 707. | 48. | 311. |
| 1.01 | 13.20 | 160 | 8.14 | 727. | 50. | 311. |
| 1.01 | 13.25 | 161 | 8.15 | 746. | 53. | 311. |
| 1.01 | 13.30 | 162 | 8.16 | 763. | 56. | 311. |
| 1.01 | 13.35 | 163 | 8.17 | 778. | 58. | 311. |
| 1.01 | 13.40 | 164 | 8.18 | 793. | 61. | 311. |
| 1.01 | 13.45 | 165 | 8.19 | 809. | 64. | 311. |
| 1.01 | 13.50 | 166 | 8.20 | 826. | 66. | 311. |
| 1.01 | 13.55 | 167 | 8.21 | 847. | 69. | 311. |
| 1.01 | 14.00 | 168 | 8.22 | 870. | 72. | 311. |
| 1.01 | 14.05 | 169 | 8.23 | 894. | 75. | 311. |
| 1.01 | 14.10 | 170 | 8.24 | 919. | 86. | 311. |

END-OF-PERIOD HYDROGRAPH ORDINATES
 MO.DA HR.MN PERIOD HOURS INFLOW OUTFLOW STORAGE STAGE

BEGIN DAM FAILURE AT 14.67 HOURS

| MO.DA | HR.MN | PERIOD | HOURS | INFLOW | OUTFLOW | STORAGE | STAGE |
|-------|-------|--------|-------|--------|---------|---------|-------|
| 1.01 | 14.45 | 177 | 14.75 | 944. | 676. | 425. | 753.8 |
| 1.01 | 14.50 | 178 | 14.80 | 967. | 682. | 424. | 753.7 |
| 1.01 | 14.55 | 179 | 14.85 | 988. | 688. | 415. | 753.6 |
| 1.01 | 15.00 | 180 | 14.90 | 1008. | 694. | 397. | 753.5 |
| 1.01 | 15.05 | 181 | 14.95 | 1023. | 700. | 369. | 753.4 |
| 1.01 | 15.10 | 182 | 15.00 | 1035. | 707. | 331. | 753.3 |
| 1.01 | 15.15 | 183 | 15.05 | 1046. | 714. | 290. | 753.2 |
| 1.01 | 15.20 | 184 | 15.10 | 1055. | 721. | 240. | 753.1 |
| 1.01 | 15.25 | 185 | 15.15 | 1078. | 729. | 217. | 753.0 |
| 1.01 | 15.30 | 186 | 15.20 | 1122. | 738. | 186. | 752.9 |
| 1.01 | 15.35 | 187 | 15.25 | 1220. | 748. | 158. | 752.8 |
| 1.01 | 15.40 | 188 | 15.30 | 1379. | 759. | 134. | 752.7 |
| 1.01 | 15.45 | 189 | 15.35 | 1595. | 771. | 114. | 752.6 |
| 1.01 | 15.50 | 190 | 15.40 | 1866. | 784. | 98. | 752.5 |
| 1.01 | 15.55 | 191 | 15.45 | 2168. | 800. | 86. | 752.4 |
| 1.01 | 16.00 | 192 | 15.50 | 2437. | 818. | 77. | 752.3 |
| 1.01 | 16.05 | 193 | 15.55 | 2628. | 838. | 71. | 752.2 |
| 1.01 | 16.10 | 194 | 15.60 | 2733. | 859. | 67. | 752.1 |
| 1.01 | 16.15 | 195 | 15.65 | 2757. | 882. | 64. | 752.0 |
| 1.01 | 16.20 | 196 | 15.70 | 2706. | 907. | 61. | 751.9 |
| 1.C1 | 16.25 | 197 | 15.75 | 2603. | 934. | 59. | 751.8 |
| 1.01 | 16.30 | 198 | 15.80 | 2462. | 963. | 56. | 749.9 |
| 1.01 | 16.35 | 199 | 15.85 | 2292. | 994. | 52. | 749.8 |
| 1.01 | 16.40 | 200 | 15.90 | 2125. | 1027. | 48. | 749.7 |
| 1.01 | 16.45 | 201 | 15.95 | 1983. | 1062. | 44. | 749.6 |
| 1.01 | 16.50 | 202 | 16.00 | 1867. | 1099. | 40. | 749.5 |
| 1.01 | 16.55 | 203 | 16.05 | 1773. | 1138. | 36. | 749.4 |
| 1.01 | 17.00 | 204 | 16.10 | 1698. | 1179. | 32. | 749.3 |
| 1.C1 | 17.05 | 205 | 16.15 | 1633. | 1221. | 29. | 749.2 |
| 1.C1 | 17.10 | 206 | 16.20 | 1579. | 1264. | 26. | 749.1 |
| 1.C1 | 17.15 | 207 | 16.25 | 1533. | 1308. | 23. | 749.0 |
| 1.C1 | 17.20 | 208 | 16.30 | 1492. | 1354. | 21. | 748.9 |
| 1.01 | 17.25 | 209 | 16.35 | 1454. | 1401. | 19. | 748.8 |
| 1.C1 | 17.30 | 210 | 16.40 | 1418. | 1450. | 18. | 748.7 |
| 1.01 | 17.35 | 211 | 16.45 | 1384. | 1500. | 16. | 748.6 |
| 1.01 | 17.40 | 212 | 16.50 | 1353. | 1551. | 15. | 748.5 |
| 1.C1 | 17.45 | 213 | 16.55 | 1325. | 1603. | 14. | 748.4 |
| 1.01 | 17.50 | 214 | 17.00 | 1301. | 1656. | 13. | 748.3 |
| 1.01 | 17.55 | 215 | 17.05 | 1280. | 1710. | 12. | 748.2 |
| 1.01 | 18.00 | 216 | 17.10 | 1262. | 1765. | 12. | 748.1 |
| 1.01 | 18.05 | 217 | 17.15 | 1246. | 1821. | 11. | 748.0 |
| 1.01 | 18.10 | 218 | 17.20 | 1227. | 1878. | 11. | 747.9 |
| 1.01 | 18.15 | 219 | 17.25 | 1204. | 1936. | 11. | 747.8 |
| 1.01 | 18.20 | 220 | 17.30 | 1172. | 1995. | 10. | 747.7 |
| 1.01 | 18.25 | 221 | 17.35 | 1128. | 2055. | 10. | 747.6 |
| 1.01 | 18.30 | 222 | 17.40 | 1074. | 2116. | 9. | 747.5 |
| 1.C1 | 18.35 | 223 | 17.45 | 1013. | 2178. | 8. | 747.4 |
| 1.01 | 18.40 | 224 | 17.50 | 949. | 2241. | 8. | 747.3 |
| 1.01 | 18.45 | 225 | 17.55 | 886. | 2305. | 7. | 747.2 |
| 1.01 | 18.50 | 226 | 18.00 | 826. | 2370. | 6. | 747.1 |
| 1.C1 | 18.55 | 227 | 18.05 | 772. | 2436. | 5. | 747.0 |
| 1.01 | 19.00 | 228 | 18.10 | 724. | 2503. | 4. | 746.9 |
| 1.01 | 19.05 | 229 | 18.15 | 684. | 2571. | 4. | 746.8 |
| 1.01 | 19.10 | 230 | 18.20 | 652. | 2640. | 4. | 746.7 |
| 1.01 | 19.15 | 231 | 18.25 | 629. | 2710. | 3. | 746.6 |
| 1.01 | 19.20 | 232 | 18.30 | 619. | 2781. | 3. | 746.5 |
| 1.01 | 19.25 | 233 | 18.35 | 610. | 2853. | 3. | 746.4 |
| 1.01 | 19.30 | 234 | 18.40 | 602. | 2926. | 3. | 746.3 |
| 1.01 | 19.35 | 235 | 18.45 | 594. | 3000. | 2. | 746.2 |
| 1.01 | 19.40 | 236 | 18.50 | 586. | 3075. | 2. | 746.1 |
| 1.01 | 19.45 | 237 | 18.55 | 578. | 3151. | 2. | 746.0 |
| 1.01 | 19.50 | 238 | 19.00 | 571. | 3228. | 2. | 745.9 |
| 1.01 | 19.55 | 239 | 19.05 | 565. | 3305. | 2. | 745.8 |
| 1.01 | 20.00 | 240 | 19.10 | 558. | 3383. | 2. | 745.7 |
| 1.C1 | 20.05 | 241 | 19.15 | 552. | 3461. | 2. | 745.6 |
| 1.C1 | 20.10 | 242 | 19.20 | 546. | 3540. | 2. | 745.5 |
| 1.C1 | 20.15 | 243 | 19.25 | 541. | 3619. | 2. | 745.4 |
| 1.C1 | 20.20 | 244 | 19.30 | 535. | 3700. | 2. | 745.3 |
| 1.C1 | 20.25 | 245 | 19.35 | 530. | 3781. | 2. | 745.2 |
| 1.C1 | 20.30 | 246 | 19.40 | 525. | 3863. | 2. | 745.1 |
| 1.C1 | 20.35 | 247 | 19.45 | 520. | 3946. | 2. | 745.0 |
| 1.C1 | 20.40 | 248 | 19.50 | 515. | 4030. | 2. | 744.9 |
| 1.C1 | 20.45 | 249 | 19.55 | 511. | 4115. | 2. | 744.8 |
| 1.C1 | 20.50 | 250 | 20.00 | 507. | 4200. | 2. | 744.7 |

OVN

HYDROGRAPH ROUTING

CHANNEL ROUTING REACH 1

| | | | | | | | | | | | | | | | | | |
|--------------|------|-------|------|-------|------|-------|-------|-------|-------|------|-------|-------|----|--------|---|-------|---|
| ISTAQ | 1 | ICOMP | 1 | IECON | 0 | ITAPE | 0 | JPLI | 0 | JPRI | 0 | INAME | I | ISTAGE | 0 | IAUTO | 0 |
| ROUTING DATA | | | | | | | | | | | | | | | | | |
| GLOSS | 0.00 | CLOSS | 0.00 | AVG | 0.00 | IRCS | 1 | ISAME | 1 | IOPT | 0 | IPMP | 0 | LSTR | 0 | | |
| MSTPS | | | | | | | | | | | | | | | | | |
| MSTPS | 1 | NSTD | 0 | LAG | 0 | AMSKK | 0.000 | X | 0.000 | TSK | 0.000 | STORA | 0. | ISPRAT | 0 | | |

NORMAL DEPTH CHANNEL ROUTING

| | | | | | | |
|--------|--------|--------|-------|-------|-------|--------|
| QNC(1) | QNC(2) | QNC(3) | ELMWT | ELMAX | RLNTH | SFL |
| .1000 | .0400 | .1000 | 732.0 | 740.0 | 250. | .01000 |

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

| | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.00 | 730.00 | 10.00 | 738.00 | 180.00 | 732.00 | 190.00 | 732.00 |
| 220.00 | 734.00 | 340.00 | 734.00 | 390.00 | 740.00 | | |

| | | | | | | | | | | | | | | |
|---------|--------|--------|---------|--------|--------|--------|--------|--------|---------|--------|---------|---------|----------|------|
| STORAGE | 0.00 | 3.03 | 3.59 | 4.10 | 4.17 | 5.31 | 6.21 | 6.53 | 7.99 | 8.01 | 1.47 | 8.94 | 1.97 | 9.87 |
| OUTFLOW | 0.00 | 11.20 | 3086.82 | 44.68 | 106.51 | 202.69 | 347.90 | 603.03 | 7752.89 | 945.34 | 1367.09 | 1865.29 | 12022.06 | |
| STAGE | 732.00 | 736.21 | 732.42 | 737.05 | 737.47 | 733.68 | 734.11 | 734.53 | 738.74 | 739.16 | 735.37 | 740.00 | | |
| FLOW | 0.00 | 11.20 | 3086.82 | 44.68 | 106.51 | 202.69 | 347.90 | 603.03 | 7752.89 | 945.34 | 1367.09 | 1865.29 | 12022.06 | |

| | | | | | | | | | | | |
|------------|-------|------|---------|--------|-------|--------|---------|-------|--------|--------------|---------|
| PEAK | 7145. | 202. | 6-HOUR | 2093. | 59. | 17. | 72-HOUR | 591. | 17. | TOTAL VOLUME | 177432. |
| CFS | | | 24-HOUR | 615. | 7.89 | 200.78 | 200.78 | 7.90 | 200.78 | 5024. | |
| CM | | | 6-HOUR | 170.56 | 1220. | 1222. | 1222. | 1507. | 1507. | 7.90 | |
| INCHES | | | 24-HOUR | 1038. | 1505. | 1507. | 1507. | 1507. | 1507. | 200.78 | |
| MM | | | 6-HOUR | 1280. | 1505. | 1507. | 1507. | 1507. | 1507. | 1222. | |
| AC-FT | | | 24-HOUR | 1505. | 1507. | 1507. | 1507. | 1507. | 1507. | 1222. | |
| THOUS CU M | | | 6-HOUR | 1507. | 1507. | 1507. | 1507. | 1507. | 1507. | 1222. | |

MAXIMUM STORAGE = 7.

MAXIMUM STAGE IS 730.5

..... HYDROGRAPH ROUTING

CHANNEL ROUTING REACH 2
 ISTAG 2 ICOMP 1 IECON 0 ITAPE 0 JPLY 0 JPR1 0 INAME 1 ISTAGE 0 IAUTO 0
 ROUTING DATA
 IRES 1 ISAME 1 IOPT 0 IPMP 0 LSTR 0
 GLOSS 0.000 AVG 0.000
 NSTPS 1 NSTDL 0 LAG 0 AMSKK 0.000 X TSK STORA ISPRAT 0

----- NORMAL DEPTH CHANNEL ROUTING -----

0M(1) 0M(2) 0M(3) ELNVT ELMAX RLNTM SEL
 .1000 .0400 .1000 712.0 720.0 900. .02000

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
 0.00 729.00 50.00 716.00 100.00 712.00 108.00 712.00 118.00 716.00
 123.00 718.00 140.00 718.00 145.00 720.00

| STORAGE | 0.00 | 3.44 | 4.09 | 4.79 | 5.46 | 6.36 | 7.34 | 8.41 | 9.53 | 10.71 | 11.94 | 12.85 |
|---------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| OUTFLOW | 0.00 | 979.31 | 1211.82 | 1475.10 | 1770.62 | 2099.84 | 2497.79 | 2952.86 | 3453.35 | 3998.92 | 4518.08 | 4989.75 |
| STAGE | 712.00 | 716.21 | 712.42 | 717.05 | 713.26 | 717.89 | 714.11 | 718.74 | 714.92 | 719.16 | 715.79 | 720.00 |
| FLOW | 0.00 | 979.31 | 1211.82 | 1475.10 | 1770.62 | 2099.84 | 2497.79 | 2952.86 | 3453.35 | 3998.92 | 4518.08 | 4989.75 |

| PEAK | 6-HOUR | 24-HOUR | 72-HOUR | TOTAL VOLUME |
|----------|-----------|-----------|-----------|--------------|
| 7177.203 | 2092.59 | 615.17 | 591.17 | 177218.5018 |
| | 6.71 | 7.88 | 7.90 | 7.90 |
| | 170.42 | 200.27 | 200.54 | 200.54 |
| | 1237.1219 | 1219.1221 | 1221.1221 | 1221.1221 |
| | 1279.1503 | 1503.1505 | 1505.1505 | 1505.1505 |

MAXIMUM STORAGE = 17.

MAXIMUM STAGE IS 721.8

SUMMARY OF DAM SAFETY ANALYSIS *MT HOPE LAKE*

| | | INITIAL VALUE | SPILLWAY CREST | TOP OF DAM | | | |
|--------------|-----------------------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| | ELEVATION | 797.00 | 796.50 | 802.00 | | | |
| | STORAGE | 633. | 543. | 1953. | | | |
| | OUTFLOW | 4. | 0. | 858. | | | |
| RATIO OF PMF | MAXIMUM RESERVOIR W.S.ELEV. | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM OUTFLOW CFS | DURATION OVER TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
| .50 | 800.42 | 0.00 | 1478. | 519. | 0.00 | 18.58 | 0.00 |

SUMMARY OF DAM SAFETY ANALYSIS *WHITE MEADOW LAKE*

| | | INITIAL VALUE | SPILLWAY CREST | TOP OF DAM | | | |
|--------------|-----------------------------|------------------------|-----------------------|---------------------|-------------------------|---------------------------|-----------------------|
| | ELEVATION | 753.00 | 752.70 | 753.70 | | | |
| | STORAGE | 320. | 280. | 417. | | | |
| | OUTFLOW | 23. | 0. | 76. | | | |
| RATIO OF PMF | MAXIMUM RESERVOIR W.S.ELEV. | MAXIMUM DEPTH OVER DAM | MAXIMUM STORAGE AC-FT | MAXIMUM OUTFLOW CFS | DURATION OVER TOP HOURS | TIME OF MAX OUTFLOW HOURS | TIME OF FAILURE HOURS |
| .50 | 753.76 | .06 | 426. | 7323. | .31 | 15.17 | 14.67 |

PLAN .1 STATION 1

| RATIO | MAXIMUM FLOW,CFS | MAXIMUM STAGE,FT | TIME HOURS |
|-------|------------------|------------------|------------|
| .50 | 7145. | 738.5 | 15.17 |

PLAN 1 STATION 2

| RATIO | MAXIMUM FLOW,CFS | MAXIMUM STAGE,FT | TIME HOURS |
|-------|------------------|------------------|------------|
| .50 | 7177. | 721.8 | 15.25 |

SUMMARY OF DAM SAFETY ANALYSIS

NON-BREACH DOWNSTREAM ROUTING

INITIAL VALUE TOP OF DAM
 753.00 752.70
 320. 280.
 23. 0.

ELEVATION
 STORAGE
 OUTFLOW

RATIO OF PMF .50
 MAXIMUM RESEPOIR W.S.ELEV 755.08
 MAXIMUM STORAGE AC-FT 618.
 MAXIMUM DEPTH OVER DAM 1.38
 MAXIMUM OUTFLOW CFS 1556.
 DURATION OVER TOP HOURS 10.42
 TIME OF MAX OUTFLOW HOURS 17.25
 TIME OF FAILURE HOURS 0.00

PLAN 1 STATION 1

RATIO .50
 MAXIMUM FLOW,CFS 1556.
 MAXIMUM STAGE,FT 735.5
 TIME HOURS 17.25

PLAN 1 STATION 2

RATIO .50
 MAXIMUM FLOW,CFS 1556.
 MAXIMUM STAGE,FT 717.2
 TIME HOURS 17.25

APPENDIX 5

Bibliography

1. "Recommended Guidelines for Safety Inspection of Dams," Department of the Army, Office of the Chief of Engineers, Washington, D.C. 20314
2. Design of Small Dams, Second Edition, United States Department of the Interior, Bureau of Reclamation, United States Government Printing Office, Washington, D.C. 1973
3. Holman, William W. and Jumikis, Alfreds R., Engineering Soil Survey of New Jersey, Report No. 9, Morris County, Rutgers University, New Brunswick, N.J. 1953.
4. "Geologic Map of New Jersey," prepared by J. Volney Lewis and Henry B. Kummel, dated 1910 - 1912.
5. Chow, Ven Te., Ed., Handbook of Applied Hydrology, McGraw-Hill Book Company, 1964.
6. Herr, Lester A., Hydraulic Charts for the Selection of Highway Culverts, U.S. Department of Transportation, Federal Highway Administration, 1965.
7. Safety of Small Dams, Proceedings of the Engineering Foundation Conference, American Society of Civil Engineers, 1974.
8. King, Horace Williams and Brater, Ernest F., Handbook of Hydraulics, Fifth Edition, McGraw-Hill Book Company, 1963.
9. Urban Hydrology for Small Watersheds, Technical Release no. 55, Engineering Division, Soil Conservation Service, U.S. Department of Agriculture, January 1975.