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NATIONAL DAM SAFETY PROGRAM. NEW JERSEY NO NAME DAM NUMBER 14 (--ETC(U)
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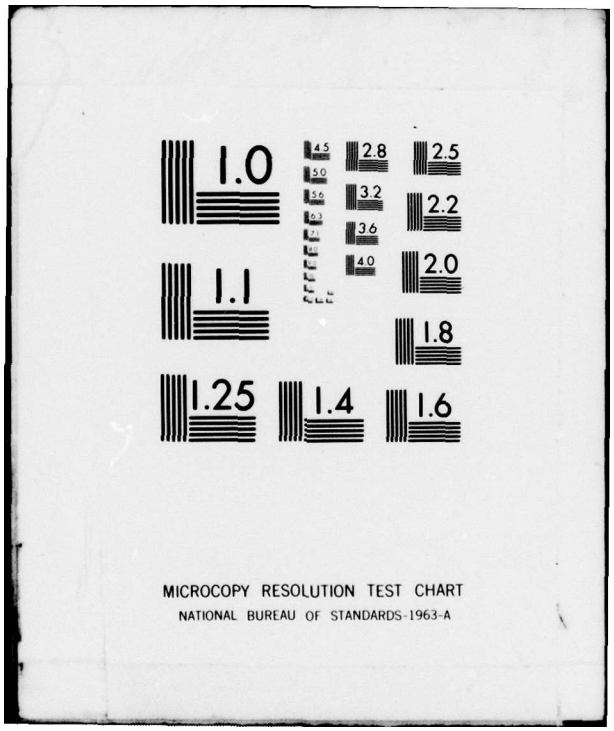
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered) UNCLASSIFIED

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: NJ00379
2. GOVT ACCESSION NO.:
3. RECIPIENT'S CATALOG NUMBER:

4. TITLE (and Subtitle): Phase I Inspection Report
National Dam Safety Program
NJ No Name Dam No 14
Sussex County, N.J.

5. TYPE OF REPORT & PERIOD COVERED: (9) FINAL rept.

6. PERFORMING ORG. REPORT NUMBER:

7. AUTHOR(s): (10) Keith F. Jolls
Jolls, F. Keith P.E.

8. CONTRACT OR GRANT NUMBER(s): (15) DACW61-79-C-0011

9. PERFORMING ORGANIZATION NAME AND ADDRESS:
Louis Berger & Associates
100 Halstead St.
East Orange, N.J. 03301

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS:

11. CONTROLLING OFFICE NAME AND ADDRESS:
U.S. Army Engineer District, Philadelphia
Custom House, 2d & Chestnut Streets
Philadelphia, Pennsylvania 19106

12. REPORT DATE: (11) Jul[illegible]979

13. NUMBER OF PAGES: 40

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): (12) 59p.

15. SECURITY CLASS. (of this report): Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

(6) National Dam Safety Program. New Jersey No Name Dam Number 14 (NJ 00379), Hudson River Basin, West Branch of Papakating Creek, Sussex County, New Jersey. Phase I Inspection Report.

17. DISTRIBUTION STATEMENT (

Approved for publi[illegible]

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)

NJ No Name Dam No 14
Spillways
Dams
Structural Analysis
Safety
Visual Inspection
National Dam Safety Program Report

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.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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

IN REPLY REFER TO
NAPEN-D

27 Sep 1978

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

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for New Jersey No Name Dam No. 14 in Sussex 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, New Jersey No Name Dam No. 14, initially listed as a high hazard potential structure, but reduced to a low hazard potential structure as a result of this inspection, is judged to be in fair overall condition and the dam's spillway is considered adequate. The following remedial actions could be undertaken:

a. The entrance to the drop inlet spillway should be reconstructed to provide an adequate weir vertical clearance.

b. The rodent burrows on the backslope should be filled and the sloughed areas backfilled and compacted.

c. To diminish the future downstream flooding potential at Pigeon Hill Road, the downstream channel should be cleared of debris.

d. The debris in the valve chamber should be removed and the 8" valves and outlet pipe inspected and investigated to ascertain the practicality of repair (these could possibly provide drawdown capability).

e. The owner should develop a checklist for periodic maintenance inspections so a record of conditions and repairs can be maintained.

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 J. 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,

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

1 Incl
As stated

Copies furnished:
Dirk C. Hofman, P.E., 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

NEW JERSEY NO NAME DAM NO. 14 (NJ00379)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 7 May 1979 by Louis Berger and Associates, Inc. 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.

New Jersey No Name Dam No. 14, initially listed as a high hazard potential structure, but reduced to a low hazard potential structure as a result of this inspection, is judged to be in fair overall condition and the dam's spillway is considered adequate. The following remedial actions could be undertaken:

a. The entrance to the drop inlet spillway should be reconstructed to provide an adequate weir vertical clearance.

b. The rodent burrows on the backslope should be filled and the sloughed areas backfilled and compacted.

c. To diminish the future downstream flooding potential at Pigeon Hill Road, the downstream channel should be cleared of debris.

d. The debris in the valve chamber should be removed and the 8" valves and outlet pipe inspected and investigated to ascertain the practicality of repair (these could possibly provide drawdown capability).

e. The owner should develop a checklist for periodic maintenance inspections so a record of conditions and repairs can be maintained.

APPROVED: Joel T. Callahan

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

DATE: 13 September 1979

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam N.J. No Name No. 14 Fed ID# NJ 00379

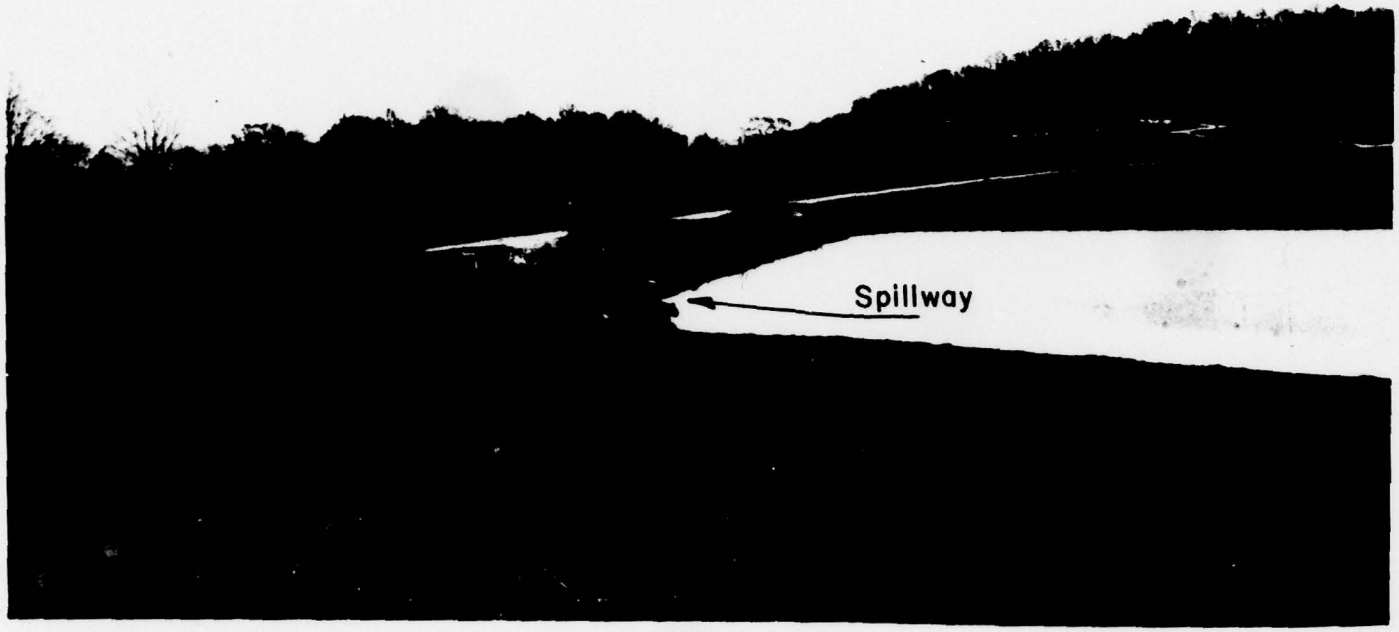
State Located New Jersey
County Located Sussex
Coordinates Lat. 4112.2 - Long. 7438.8
Stream Tributary - West Branch and Papakating Creek
Date of Inspection 7 May 1979

ASSESSMENT OF GENERAL CONDITIONS

N.J. No Name Dam No. 14 is assessed to be in a fair overall condition and has sufficient spillway capacity to discharge the design flood. It is recommended that the hazard classification be downgraded to low, as a failure would probably not result in loss of life or significant downstream property damage.

No detrimental findings were uncovered to merit further engineering studies. Recommended remedial actions to be undertaken in the future include 1) reconstruction of the drop inlet entrance, 2) refill rodent burrows on the backslope, and 3) remove debris in downstream channel, and 4) investigate the feasibility of repairing the 8" valves and outlet pipe.

F. Keith Jolls P.E.
Project Manager



OVERVIEW OF NO NAME DAM NO. 14

MAY, 1979

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of 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 a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the establisned 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 aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
NAME OF DAM: N.J. No Name No. 14 FED #NJ 00379

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

This report is authorized by the Dam Inspection Act, Public Law 92-367, and has been prepared in accordance with Contract FPM-36 between Louis Berger & Associates, Inc. and the State of New Jersey and its Department of Environmental Protection, Division of Water Resources. The State, in turn, is under agreement with the U.S. Army Corps of Engineers, Philadelphia to have this inspection performed.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the structural and hydraulic condition of N.J. "No Name" Dam No. 14 and appurtenant structures, and to determine if the dam consitutes a hazard to human life or property.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The dam at N.J. No Name Site No. 14 is a 310 foot long earth embankment with a concrete box drop inlet, 24 inch diameter reinforced concrete outlet pipe and an auxiliary spillway located at the left abutment. The embankment crest width is 20 feet and has 2H:1V side slopes and a maximum height of approximately 25 feet to the crest elevation of 565. The reservoir face is partially protected by riprap up to elevation 563. A concrete block valve chamber containing two 8-inch valves is located approximately 15 feet to the right of the outlet pipe. The valve chamber outlet is an 8 inch diameter cast iron pipe which discharges into the main outlet channel.

b. Location

The dam impounds a small farm lake 500 feet southwest of the falls on the West Branch tributary to the Papakating Creek in the community of Woodburne, Wantage Township, Sussex County, New Jersey. The dam is located 1000 feet south of the junctions of Haggerty Road and County Road 565 and is roughly 1 mile west of Sussex Airport.

c. Size Classification

The dam at N.J. No Name No. 14 has a maximum height of 25 feet and a maximum storage capacity of 140 acre-feet. Accordingly, this dam is in the small size category as defined by the criteria in the Recommended Guidelines for Safety Inspection of Dams (storage less than 1,000 acre-feet and height less than 40 feet).

d. Hazard Classification

The dam is located in a sparsely inhabited area of Sussex County characterized by low, rolling topography. Immediately downstream from the dam is an abandoned barn and farm house where the outlet channel passes through a 42" diameter pipe culvert under Pidgeon Hill Rd. The channel then immediately plunges into the West Branch gorge which is about 50 feet deep and 400 feet wide at this point. Except for one home on the east side of Pidgeon Hill Road, there are no buildings between the dam and the lower river gorge which would be endangered by a failure. While Pidgeon Hill Road could be flooded it is felt that damage to the road and the home would be minimal. Accordingly, it is recommended that this dam be downgraded to a low hazard classification.

e. Ownership

This dam is owned by Westgate Associates, 10 Main Street, Sussex, N.J.

f. Purpose of Dam

Although no state application for construction permit was located, it is believed that this dam was constructed to form a farm pond for agricultural water supply.

g. Design and Construction History

Nothing is known concerning the design or construction although it is reputed to have been constructed in the early 1960's.

h. Normal Operation Procedures

Nothing is known concerning operations and it is reputed to have been unattended for several years (according to local residents).

1.3 PERTINENT DATA

a. Drainage Area

N.J. No Name No. 14 has a drainage area of 0.13 square miles which consist primarily of rolling farmland.

b. Total combined spillway capacity at maximum pool elevation - 204 cfs

c. Elevations (ft. above MSL)

Top of dam - 565
Principal spillway crest - 562
Auxiliary spillway crest - 563
Streambed at centerline of dam - 540±

d. Reservoir

Length of maximum pool (top of dam) - 1,850 feet

Length of normal pool (principal spillway crest) - 1,750 feet

e. Storage (acre-feet)

Top of dam - 140
Normal pool - 85

f. Reservoir Surface (acres)

Top of dam - 19.5
Normal pool - 17

g. Dam

Type - Earth with drop inlet and auxiliary spillway

Length - 310 feet

Height - 25 feet

Top Width - 20 feet

Side Slopes - 2H:1V

Zoning - Unknown

Impervious Core - Unknown

Cutoff - Unknown

Grout curtain - Unknown

h. Diversion and Regulating Tunnel - None

i. Spillway (Auxiliary)

Type - Trapezoidal channel at left abutment.

Crest elevation - 563

Channel width - 8 feet bottom width
17 feet top width

Gates - None

U/S Channel - Negatively sloped, vegetated inlet

D/S Channel - Positively sloped, vegetated outlet

j. Regulating Outlets

Primary outlet is a 3' x 3' drop inlet structure consisting of a concrete box riser with a 24-inch diameter concrete outlet pipe.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

Information pertaining to the design was not available for review. An extensive search failed to locate any design data and it appears the dam may have been constructed without permit. However a geotechnical review provided an overall assessment of probable foundation conditions. The dam is located in a region underlain by Ordovician Martinsburg shale. The overburden consists of recent alluvium of stratified sand and gravel stream deposits while the residual soil is a thick-bedded, glaciated shale with clay to gravel-size particles. It appears the embankment was constructed on the existing overburden but grades into bedrock at the left abutment.

2.2 CONSTRUCTION

No information was obtained pertaining to the construction. Field measurements provided sufficient as-built data to assess the hydraulic capacity of the spillways.

2.3 OPERATION

There is no information available. (See Section 4).

2.4 EVALUATION

a. Availability

While the original design and construction data is not available, the field reconnaissance revealed sufficient overall geometry to enable the inspection team to complete its evaluation. There is, however, insufficient information available with which to evaluate the drawdown capabilities (see Section 5).

b. Adequacy

In view of the hazard classification and present condition of the dam the information obtained is believed to be adequate to perform the following assessment.

c. Validity

No design information was available for evaluation.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

The visual inspection was conducted on May 7, 1979. While the dam was in a fair overall condition, it appears that routine maintenance had been neglected for an extended period. The lake level was about 2 inches above the crest elevation of the drop inlet at the time of the inspection.

b. Dam

The embankment is a straight, relatively low structure lying between two naturally higher abutment zones. The dam is approximately 310 feet long with a 17 feet wide trapezoidal spillway located at the left abutment. The crest is 20 feet wide and appears of fairly uniform line and grade although somewhat rutted by vehicular and animal tracking. The grassed downstream slope has several diagonal cowpaths extending from the dam crest to a barn located near the junction of the downstream toe and the right abutment. Vegetation on the crest and face of the dam is cropped short while some thicker brush was noted on the downstream slope. There is a narrow path along the upstream face at the waterline. The area immediately adjacent to the drop inlet appears to have settled with some accompanying embankment slumping (the depressed area and path appear to have been created by livestock). The front face is irregular with numerous small erosion gullies and displaced riprap, but below the waterline, the slope appears quite uniform and the riprap cover evenly distributed. Several large rodent burrows were noted on the backslope of the dam as well as minor erosion around the outlet pipe.

c. Appurtenant Structures

Discharge is provided by a concrete drop inlet structure with a 24 inch diameter outlet pipe

and an auxiliary spillway located at the left abutment. A gate valve structure and 8" cast iron discharge pipe on the downstream slope indicate the presence of a low level drain/ water supply intake but this could not be confirmed. There is a small farm pumphouse about 200 feet below the dam but the building appears abandoned. The concrete-block valve chamber is located 15 feet to the right of the outlet pipe and 20 feet up the embankment from the toe. The chamber, which contains two 8 inch valves (one of which is leaking) and a C.I. outlet pipe, is filled with debris. The valves and the outlet pipe appear to be separated and if the valves were opened, the chamber could fill with water faster than the outlet pipe could discharge it.

The drop inlet consists of a concrete box riser with 8 inch thick walls and a 3' x 3' opening. The concrete crest is badly spalled. The top is covered with a large, stone slab which rests unevenly across the inlet and somewhat restricts inflow into the riser. The inside conditions could not be observed since the stone slab could not be moved. The discharge pipe protrudes directly from the toe of the downstream slope with no headwall or retaining structure although the pipe appears to lie on a bed of medium-sized stone. The pipe is spalled and there is localized erosion around the end.

The auxiliary spillway has an irregular trapezoidal cross-section which is 8 feet wide at the bottom and 17 feet wide at crest elevation. The left wall is cut into the shale bedrock which forms the abutment foundation. The auxiliary spillway curves around the dam from left to right and discharges into the outlet channel about 50 feet downstream of the outlet pipe. The auxiliary channel is covered with field grass except for a soft, damp section about midway down the backslope where livestock has trampled the vegetation.

d. Reservoir Area

The man-made pond occupies a shallow depression in this region of northern New Jersey known as

the Great Valley and is surrounded by higher hills on all sides. The land around the reservoir has been cleared for agriculture but a few isolated stands of woodland remain. The shoreline appears quite stable and is clear of debris.

e. Downstream Channel

The outlet channel is cluttered with debris and constricted for the short distance before joining the West Branch tributary of Papakating Creek. Approximately 150 feet downsteam of the dam, an abandoned barn has collapsed across the channel. The abandoned spring house and an automobile are located on the bank next to the collapsed barn. The channel is heavily silted below the collapsed barn where fallen trees, heavy vegetation, and wire screen fencing are severely constricting the flow. About 300 feet downstream, the brook passes through a 42 inch diameter pipe culvert under Pidgeon Hill Road before entering the West Branch gorge.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

Operational procedures were not observed by the inspection team. Conversation with a local resident revealed the dam has been basically unattended for several years. There are no indications that the gate valves have been operated in the recent past.

4.2 MAINTENANCE OF DAM

Maintenance appears to have been completely neglected. Discussions were held with a representative of the owner who indicated the property is being held for development purposes but that no maintenance procedures are presently in force. While the vegetation on the crest and slopes appear well trimmed, this is the result of grazing livestock rather than an active maintenance program.

4.3 DESCRIPTION OF ANY WARNING SYSTEM

No formal warning system exists at the dam.

4.4 EVALUATION OF OPERATIONAL ADEQUACY

Since the dam is essentially self-regulated, formal operational procedures are felt to be superfluous. However, periodic maintenance and monitoring is considered to be deficient. While the design configuration inherently provides controlled flood water release without attendant operational personnel, periodic checks and inspection are deemed to be essential to assure continued safe performance.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

a. Design Data

Based on the criteria in the Recommended Guidelines for Safety Inspection of Dams, a 100-year frequency event was selected as the design storm by the inspection team. Precipitation data was obtained from Technical Paper 40 and NOAA Technical Memorandum NWS Hydro - 35. The inflow to the reservoir for the selected 100-year storm was computed utilizing the HEC-1 computer program. This gave a peak inflow to the reservoir of 682 cfs and routing reduced the peak to 27 cfs. The combined spillways have a maximum discharge capacity of approximately 204 cfs before overtopping occurs and therefore can adequately accommodate the design flood.

b. Experience Data

There was no hydraulic information available.

c. Visual Observations

The constricted downstream channel appears to severly restrict the flow before passing under Pidgeon Hill Road but there were no signs of recent flooding or collection of drift. It appears that the auxiliary spillway has only very infrequently (if ever) transmitted any discharge.

d. Overtopping Potential

As there are no records of the dam having been overtopped and since the main and auxiliary spillway can easily accommodate the design flood, there is very little potential for overtopping. From a design standpoint, the overall hydraulics are very conservative.

e. Drawdown

It could not be ascertained whether or not there were any outlets by which the lake could be effectively dewatered. If operable, the two valves for the 8" pipe could function as a drawdown device. However, the valves did not appear to be in a working condition. Should they prove operable, drawdown time would be approximately 17 days.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Although the embankment is surficially marred by minor sloughing and cowpaths, it has retained its general shape and appears to be solidly compacted and impermeable. For much of the overall length (excepting at the drop inlet) it is of modest height and of minor structural concern regarding stability or sliding. The observed seepage in the vicinity of the auxiliary spillway appears to be the result of natural surface run-off from the adjacent shale outcrops. Similarly, the small riser inlet is of secondary structural importance although the present inlet conditions are poor and should be rehabilitated. The dam has suffered only minor deterioration to date from the lack of maintenance but if conditions go unchecked, future remedial work may prove far more costly than if untaken in the near future.

b. Design and Construction Data

From the existing geometry, the dam appears to have been conservatively designed and positioned correctly across the natural saddle in the outlet channel. As previously explained, no design plans or construction data was located and the NJDEP apparently has no Dam Application or microfilm records regarding this structure.

c. Operating Records

There are no operating records available or data regarding earlier inspections.

d. Post Construction Changes

Nothing could be learned about post-construction modifications. It appears quite likely that the dam is presently in its initial configuration although the crest width is considerably wider than normally dictated by design.

e. Seismic Stability

The lake is located in Seismic Risk Zone 1 and experience indicates that low dams of this design will have adequate stability under dynamic loading conditions if stable under static loading conditions. Based on field observations and the satisfactory performance of this dam since its construction, it is the opinion of the inspection team that the dam is stable under static loading conditions.

SECTION 7 - ASSESSMENTS/RECOMMENDATIONS/ REMEDIAL ACTIONS

7.1 DAM ASSESSMENT

a. Safety

Subject to the limitations of the Phase I visual inspection, No Name Dam No. 14 is adjudged to be in a fair overall condition. The embankment is constructed of an unknown composition but is adequately protected by riprap on its upstream face. Due to its large width to height ratio, its permeability is negligible as is the overtopping potential. The discharge capacity of the spillways are adequate to accommodate the design flood. In view of the lack of downstream hazards, it is recommended that the hazard classification be downgraded to low.

b. Adequacy of Information

Although no records were located, the information gathered for the Phase I inspection is deemed to be adequate regarding the safe operation and structural stability. It is believed that little other engineering information is available.

c. Urgency

No urgency is attached to the findings contained herein and the remedial work should be undertaken in the future.

d. Necessity for Further Study

Additional inspections are believed to be unnecessary as the dam does not constitute a serious hazard to human life or a potential danger to downstream property.

7.2 RECOMMENDATIONS/REMEDIAL MEASURES

a. Recommendations

- The entrance to the drop inlet spillway should be reconstructed to provide an adequate weir vertical clearance.

- The rodent burrows on the backslope should be filled and the sloughed areas backfilled and compacted.

- To diminish the future downstream flooding potential at Pigeon Hill Road, the downstream channel should be cleared of debris.

- The debris in the valve chamber should be removed and the 8" valves and outlet pipe inspected and investigated to ascertain the practicality of repair (these could possibly provide drawdown capability).

b. O&M Maintenance and Procedures

The owner should develop a checklist for periodic maintenance inspections so a record of conditions and repairs can be maintained. Inasmuch as the dam is owned by private interests who apparently do not reside in the immediate area, the local police and Civil Defense authorities should develop definitive plans for monitoring the dam during periods of heavy flows and establish procedures for alerting the homes immediately downstream in the event of potential floods.

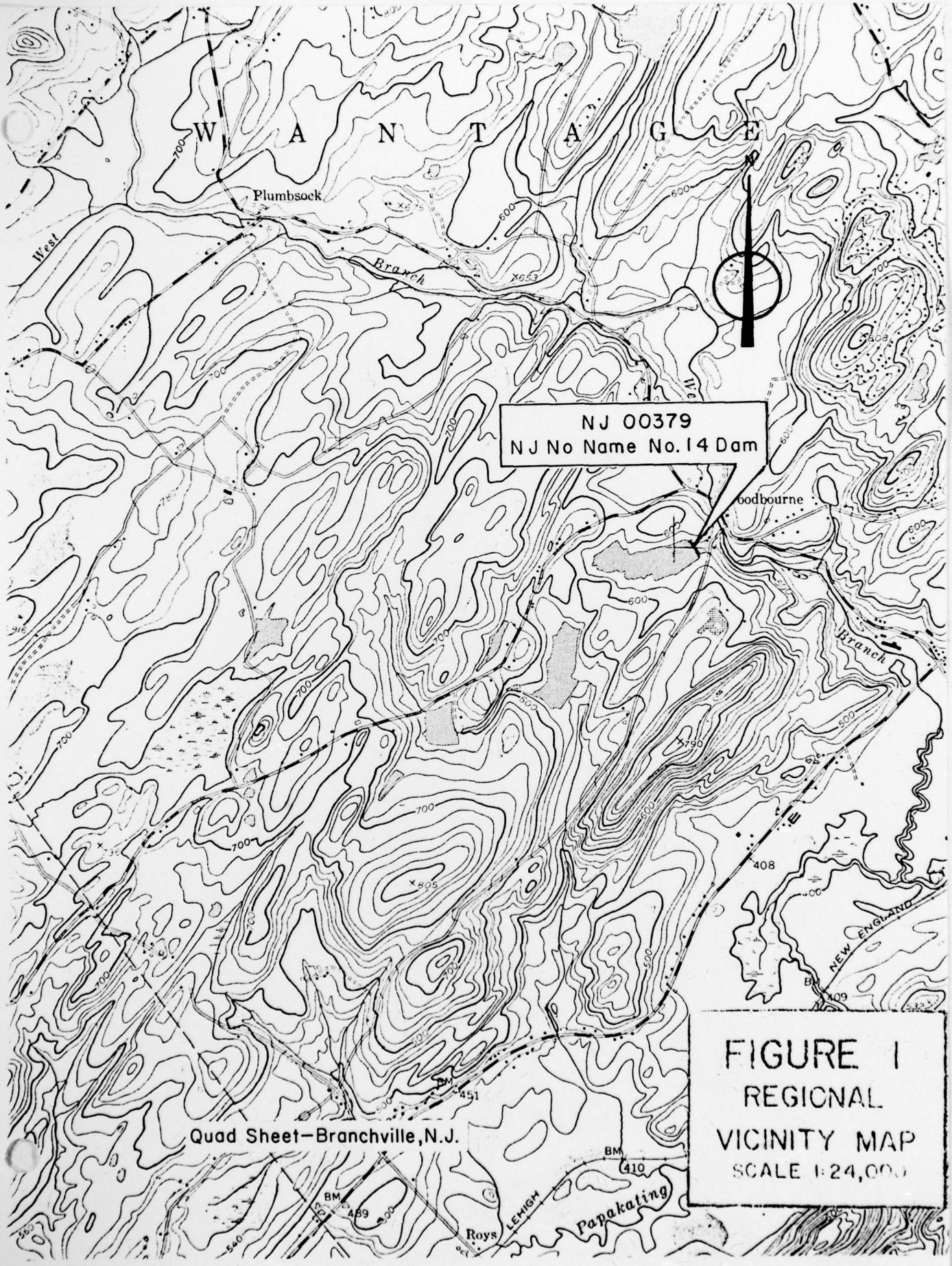
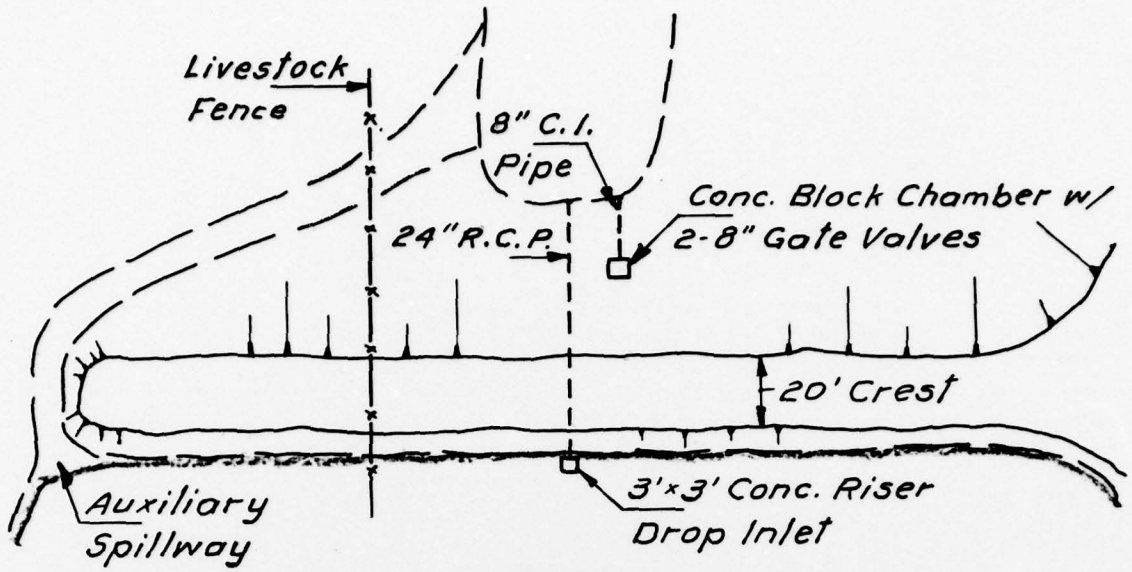
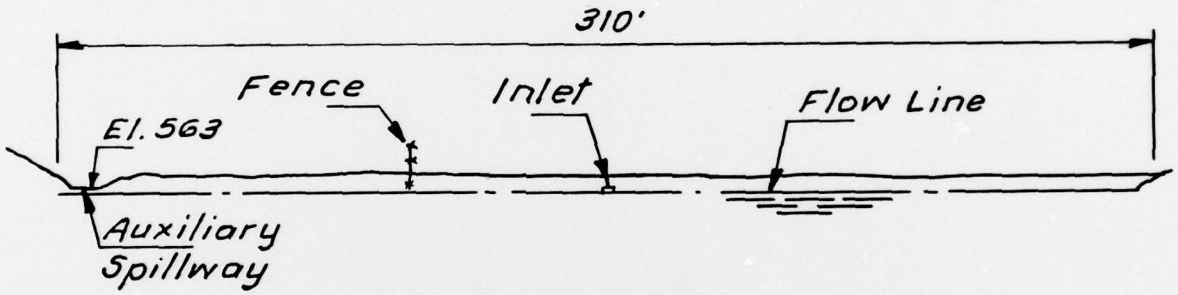


FIGURE 1
REGIONAL
VICINITY MAP
SCALE 1:24,000

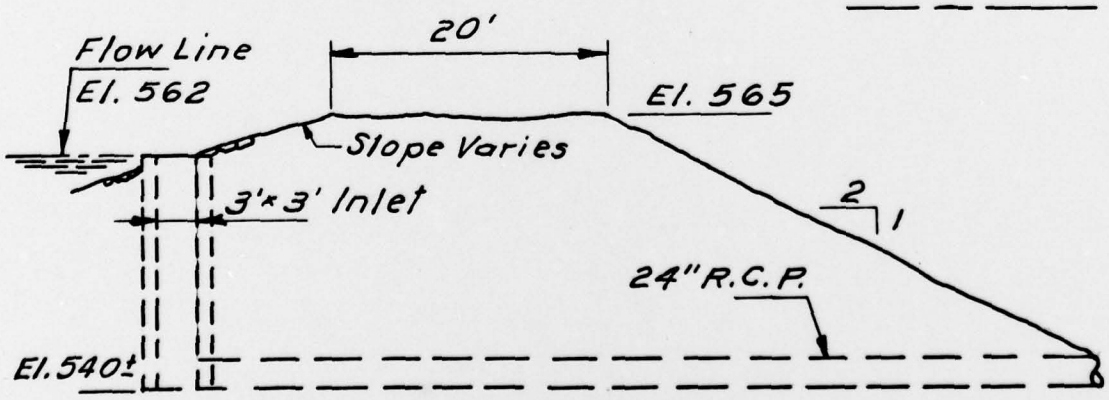


PLAN



ELEVATION

Not to Scale



SECTION THRU DAM

FIGURE 2

Check List
Visual Inspection
Phase 1

Name Dam N.J. NO NAME NO. 14 County Sussex State New Jersey Coordinators N.J.D.E.P.

Date(s) Inspection 5/7/79 Weather Clear Temperature 60°

Pool Elevation at Time of Inspection 562 M.S.L. Tailwater at Time of Inspection 540 M.S.L.

Inspection Personnel:

T. Chapter R. Lang

K. Greenfield

K. Jolls

T. Chapter Recorder

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None visible	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	Depressed area 10' wide at inlet. Unable to see inlet structure which is covered with a large flat stone slab. Small berm along toe.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Slumping at inlet - Several diagonal cowpaths on backslope from crest to barns. Front and back slope about 2 to 1.	
VERTICAL AND HORIZONTAL ALINEMENT OF THE CREST	Crest straight- No settlement - Compacted by vehicles and cows.	
RIPRAP FAILURES	Rip rap along upstream face overgrown. Appears fairly uniform where seen just below water surface.	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
EXCESSIVE SHRUB GROWTH, TREES, ETC.	Grass and dandelion cover well grazed.	Back slope needs trimming, brush height about 18".
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Okay - Embankment grades into bedrock abutment on left side; Grades smoothly into flat terrain on right.	
ANY NOTICEABLE SEEPAGE	Dampness along aux. spillway about 75' down channel.	Probably from abutment slope rather than dam.
STAFF GAGE AND RECORDER	N/A	
DRAINS	Steel pipe partially buried to right of outlet appears to drain valve chamber located about 20' upslope. Two 8" valves in chamber; one leaking. Chamber filled with debris.	May be a low level drain for lake.

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Minor deterioration on end of pipe.	
INTAKE STRUCTURE	Pebbley surface - Most of box not seen as it is submerged.	Box 3' x 3' - Walls about 8" thick.
OUTLET STRUCTURE	Pipe comes right out of embankment (No headwall)	Very light erosion around outlet.
OUTLET CHANNEL	Cluttered - collapsed barn in channel - Heavy sedimentation downstream - Channel passes through 42" culvert under road 300 feet downstream.	Debris in Channel should be removed.
EMERGENCY GATE	None	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	None	
APPROACH CHANNEL	Negatively sloped, vegetated, 8' wide approach - Bedrock forms left wall.	
DISCHARGE CHANNEL	Positively sloped vegetated channel curves around toe of dam from left to right blending with the downstream outlet channel.	Dampness along portion of channel appears to be from seepage along the bedrock/ overburden interface of steep left wall.
BRIDGE AND PIERS	None	

GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL		
APPROACH CHANNEL		
DISCHARGE CHANNEL		
BRIDGE AND PIERS		
GATES AND OPERATION EQUIPMENT		

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None observed	
OBSERVATION WELLS	None observed	
WEIRS	None observed	
PIEZOMETERS	None observed	
OTHER	No instrumentation noted.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Gently rising pastures and cultivated fields. No development in immediate vicinity of lake.	
SEDIMENTATION	Unable to determine.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Barn collapsed into channel about 150' downstream. Channel passes under road through 42" dia. culvert about 300' downstream. Below road, stream drop into a 50' deep gorge of the West Branch.	Downstream channel should be cleared of all debris.
SLOPES	Side slopes approx. 2H:1V as far as the road. Slope of gorge about 1H:2V.	
APPROXIMATE NO. OF HOMES AND POPULATION	Two homes along the road 150' downstream. One empty and deserted. Second at somewhat higher elevation across road from channel may sustain some damage if dam failed. Below road the gorge would absorb a flood with little difficulty.	Downgraded hazard condition.

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Not available (No microfilm records at NJDEP)
REGIONAL VICINITY MAP	USGS Quad
CONSTRUCTION HISTORY	Unknown - Believe constructed about 1961-62.
TYPICAL SECTIONS OF DAM	Not available
HYDROLOGIC/HYDRAULIC DATA	" "
OUTLETS - PLAN	" "
- DETAILS	" "
-CONSTRAINTS -DISCHARGE RATINGS	" " "
RAINFALL/RESERVOIR RECORDS	" "

ITEM	REMARKS
SPILLWAY PLAN	Not available
SECTIONS	" "
DETAILS	" "
OPERATING EQUIPMENT PLANS & DETAILS	" "

ITEM	REMARKS
DESIGN REPORTS	None available
GEOLOGY REPORTS	" "
DESIGN COMPUTATIONS	" "
HYDROLOGY & HYDRAULICS	" "
DAM STABILITY	" "
SEEPAGE STUDIES	" "
MATERIALS INVESTIGATIONS	" "
BORING RECORDS	" "
LABORATORY	" "
FIELD	" "
POST-CONSTRUCTION SURVEYS OF DAM	None Available
BORROW SOURCES	" "

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	Unknown
HIGH POOL RECORDS	None available
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	" "
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None available
MAINTENANCE OPERATION RECORDS	" "

View of No Name #14 Dam Looking East May, 1979

View of Downstream Channel May, 1979

May, 1979

View of Intake Structure

May, 1979

View of Outlet Pipe

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 0.13 sq. mi.

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 562 MSL (85 Ac. ft.)

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

ELEVATION MAXIMUM DESIGN POOL: Unknown

ELEVATION TOP DAM: 565 MSL

CREST: Auxiliary spillway

a. Elevation 563
b. Type Trapezoidal auxiliary spillway channel
c. Width 8 feet bottom width, 17 feet top width
d. Length Approx. 150 feet
e. Location Spillover Left abutment
f. Number and Type of Gates None

OUTLET WORKS: Drop inlet structure

a. Type Concrete box riser
b. Location 140 feet from left abutment
c. Entrance inverts Unknown
d. Exit inverts 540 approx.
e. Emergency draindown facilities Unknown

HYDROMETEOROLOGICAL GAGES: None

a. Type
b. Location
c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 204 cfs

BY D.J.M. DATE 6-79
CHKD. BY ____ DATE ____
SUBJECT ____

LOUIS BERGER & ASSOCIATES INC.
N.J. NO NAME #14 DAM

SHEET NO. A1 OF
PROJECT C234

Time of concentration :

A time of concentration of 5 minutes is assumed and a five minute increment used

$$\therefore \quad t_p = \frac{0.083}{2} + 0.6 \times 0.083 = 0.092 \text{ hours}$$

$$Q_p = \frac{484 \times 0.13}{0.092} \approx 687 \text{ cfs}$$

Precipitation :

Time (mins)	Precipitation (inches)	Δ (inches)	Rearrange Δ (inches)
5	0.80	0.80	0.02
10	1.28	0.48	0.02
15	1.70	0.42	0.02
20	1.94	0.24	0.02
25	2.17	0.23	0.02
30	2.40	0.23	0.02
35	2.54	0.14	0.02
40	2.67	0.13	0.02
45	2.80	0.13	0.02
50	2.90	0.10	0.02
55	3.00	0.10	0.02
60	3.10	0.10	0.02
65	3.20	0.10	0.03
70	3.30	0.10	0.02
75	3.40	0.10	0.03
80	3.50	0.10	0.03

BY D.J.M. DATE 6-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A2 OF

CHKD. BY ____ DATE ____ N.J. No NAME # 14 DAM PROJECT C234

SUBJECT ____

Time (mins)	Precipitation (inches)	Δ (inches)	Rearrange Δ (inches)
85	3.60	0.10	0.03
90	3.70	0.10	0.03
95	3.76	0.06	0.03
100	3.81	6.05	0.03
105	3.86	0.05	0.03
110	3.91	0.05	0.04
115	3.96	0.05	0.04
120	4.00	0.04	0.04
125	4.04	0.04	0 05
130	4.08	0.04	0 05
135	4.12	0.04	0.10
140	4.16	0.04	0.10
145	4.19	0.03	0.10
150	4.22	0.03	0.10
155	4.25	0.03	0.10
160	4.28	0.03	0.13
165	4.31	0.03	0.23
170	4.34	0.03	0.24
175	4.37	0.03	0.48
180	4.40	0.03	0.80
185	4.43	0.03	0.42
190	4.46	0.03	0.23
195	4.49	0.03	0.14
200	4.52	0.03	0.13
205	4.55	0.03	0.10
210	4.58	0.03	0.10
215	4.60	0.02	0.10
220	4.62	0.02	0.10
225	4.64	0.02	0.06
230	4.67	0.03	0.05

BY D.J.M. DATE 6-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A3 OF

CHKD. BY _____ DATE _____ N.J. NO NAME #14 DAM PROJECT C234

SUBJECT _____

Time (mins)	Precipitation (inches)	Δ (inches)	Rearrange Δ (inches)
235	4.69	0.02	0.05
240	4.71	0.02	0.04
245	4.74	0.03	0.04
250	4.76	0.02	0.03
255	4.78	0.02	0.03
260	4.80	0.02	0.03
265	4.82	0.02	0.03
270	4.84	0.02	0.03
275	4.86	0.02	0.03
280	4.88	0.02	0.03
285	4.90	0.02	0.02
290	4.92	0.02	0.02
295	4.94	0.02	0.02
300	4.96	0.02	0.03
305	4.98	0.02	0.02
310	5.00	0.02	0.02
315	5.02	0.02	0.02
320	5.04	0.02	0.02
325	5.06	0.02	0.02
330	5.08	0.02	0.02
335	5.10	0.02	0.02
340	5.12	0.02	0.02
345	5.14	0.02	0.02
350	5.16	0.02	0.02
355	5.18	0.02	0.02
360	5.20	0.02	0.02

BY D.J.M. DATE 6-79
CHKD. BY _____ DATE _____
SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.
N.J. NO. NAME #14 DAM

SHEET NO. 14 OF
PROJECT C-234

Unitgraph :

Time (hours)	T/Tp	Dimensionless Ordinate (DO)	Q (cfs) = Qp x DO
0.083	0.902	0.98	670
0.167	1.815	0.40	274
0.250	2.717	0.11	75
0.333	3.620	0.03	21
0.417	4.533	0.009	6
			Σ 1046

check :

$$\frac{1046 \times \cancel{Vt} \times 3600}{0.13 \times 5280^2 \times \cancel{Vt}} = 1.039$$

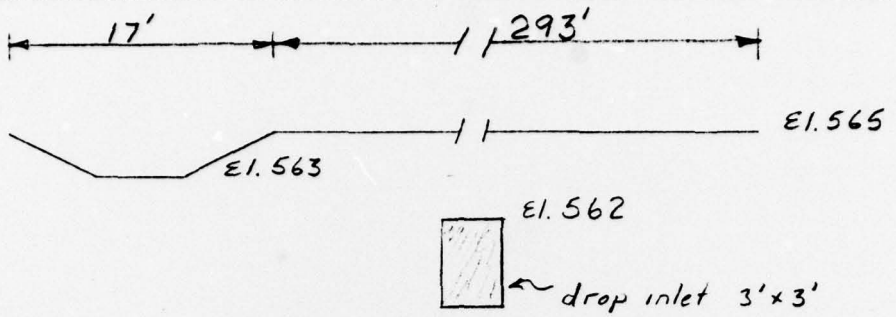
$1.039 \approx 1$ so O.K.

BY D.J.M. DATE 5-79
CHKD. BY ____ DATE ____
SUBJECT ____

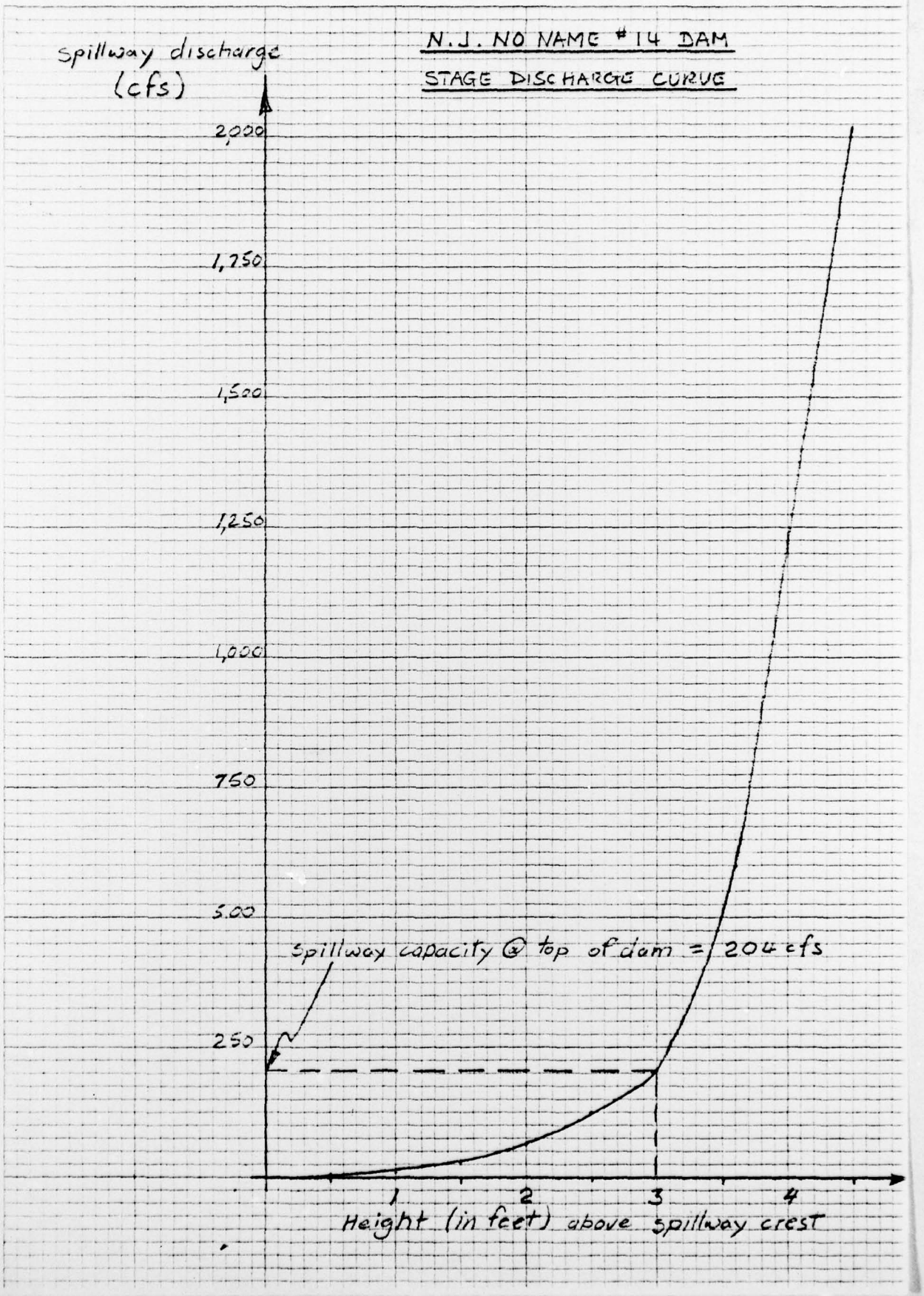
LOUIS BERGER & ASSOCIATES INC.

N.J. NO. NAME * 14 DAM

SHEET NO. A5 OF
PROJECT C234



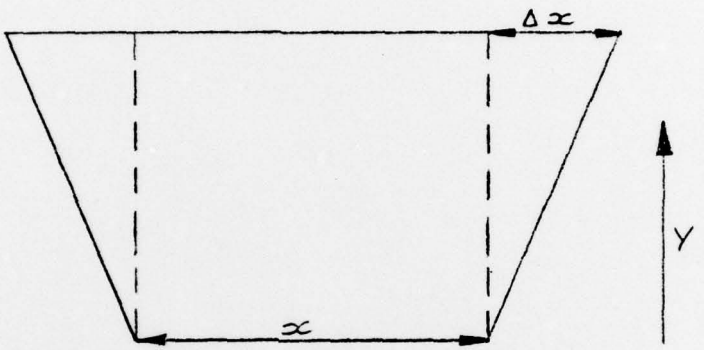
flow into drop inlet Effective Area = 2.25 ft.²				Through auxillary S=0.02 n=0.035		Over dam L = 293'			ΣQ
Elev.	H	C=0.5	Q	H	Q	H	C	Q	Q
562.0	0		0						0
562.5	0.5		6						6
563.0	1.0		9	0	0				9
563.5	1.5		11	0.5	16				27
564.0	2.0		13	1.0	53				66
564.5	2.5		14	1.5	110				124
565.0	3.0		16	2.0	188	0	2.7	0	204
565.5	3.5		17	2.5	294	0.5	2.7	280	591
566.0	4.0		18	3.0	414	1.0	2.7	791	1223
566.5	4.5		19	3.5	545	1.5	2.7	1453	2017



LOUIS BERGER & ASSOCIATES INC.
N.J. NO. NAME # 14 DAM

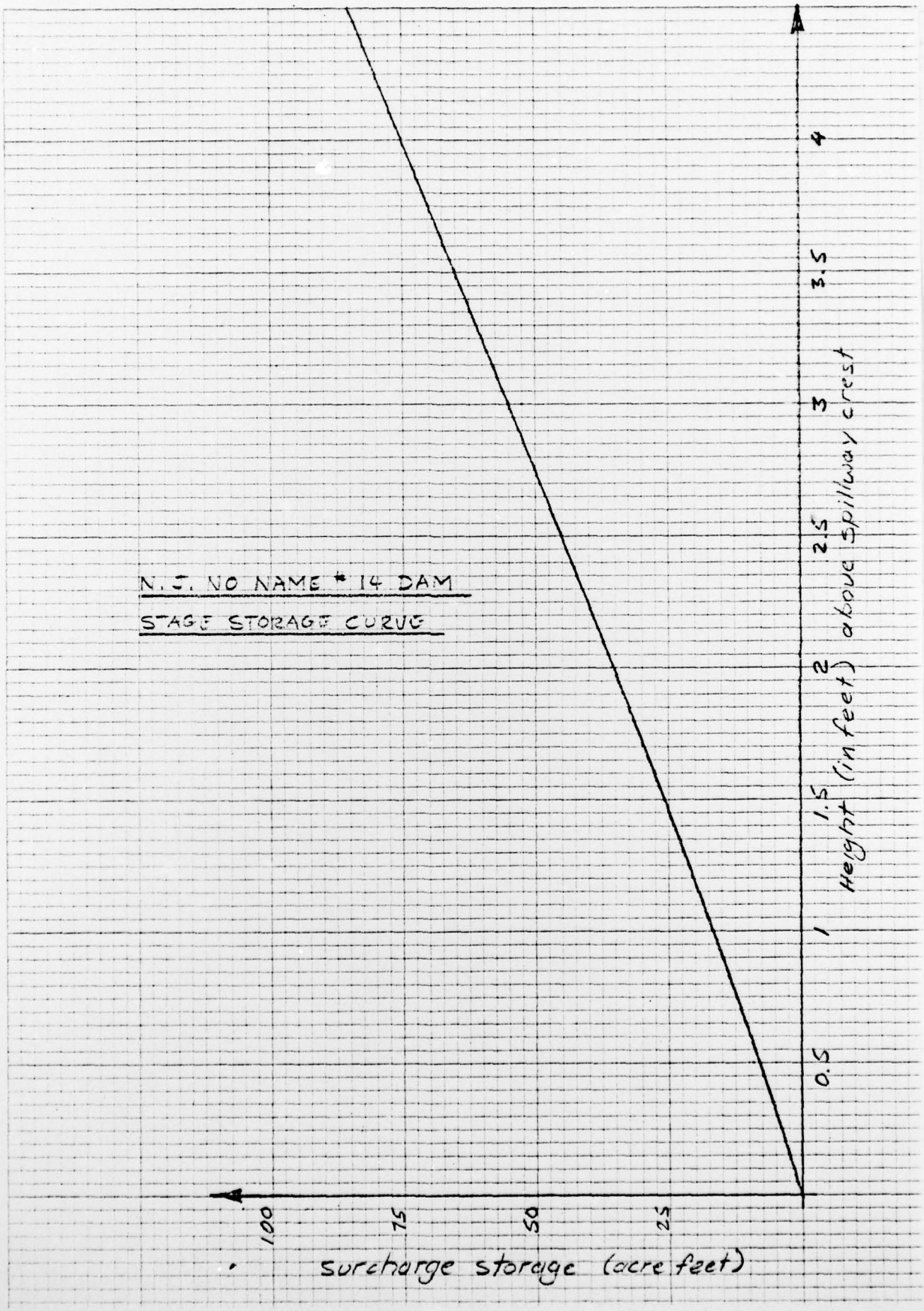
SURCHARGE STORAGE:

Area of lake @ normal pool = 17 acres
Area of lake @ top of dam = 19.5 acres
Area of 580' contour = 32 acres



Increment in volume $\Delta V = (x + \Delta x)Y$

Height in feet above spillway crest	Surcharge Storage (acre feet)
0	0
0.5	9
1.0	17
1.5	26
2.0	36
2.5	45
3.0	55
3.5	65
4.0	75
4.5	85



BY D.J.M. DATE 6-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A1 OF
CHKD. BY DATE N.J. NO NAME PROJECT C-234
SUBJECT

GENERAL SUMMARY OF APPENDIX :

length of dam = 310'
length of spillway = 9'
average length of auxiliary spillway = 12.5'

Maximum non damaging discharge = 204 cfs

Surcharge storage @ top of dam = 55 acre feet
storage @ normal pool = 85 acre feet

. . Maximum storage @ top of dam = 140 acre feet

Area of lake @ normal pool = 17 acres
Area of lake @ top of dam = 19.5 acres

Drainage area = 0.13 square miles

BY D J M DATE 6-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. A10 OF

CHKD. BY ____ DATE ____ N.J. NO DAME #14 DAM PROJECT C-234

SUBJECT Approximate drawdown curve

Normal pool storage = 85 acre feet
= 3702600 feet^3

Available head = 22' assume drawdown in three stages through 8" pipe

i) Head = 18.33'
Q = 4 cfs

$$\text{time} = \frac{3702600}{4 \times 3600 \times 3} = 85.7 \text{ hours}$$

ii) Head = 11'
Q = 3 cfs

$$\text{time} = \frac{3702600}{3 \times 3600 \times 3} = 114.3 \text{ hours}$$

iii) Head = 3.67'
Q = 1.6 cfs

$$\text{time} = \frac{3702600}{1.6 \times 3600 \times 3} = 214.3 \text{ hours}$$

$$\Sigma \text{ time} = (214.3 + 114.3 + 85.7)/24 = 17.3 \text{ days}$$

Say 17 ½ days

No inflow or tailwater assumed

BY L.J.M DATE 6-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. All OF

CHKD. BY _____ DATE _____ N.J. NO NAME #14 DAM PROJECT C-224

SUBJECT _____

N.J. NO NAME 14 DAM
BY D.J.M.
JUNE 25 1979

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
100	0	5	0	0	0	0	0	0	0

JOPER NWT
3 0

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

SUB-AREA RUNOFF COMPUTATION

INFLOW TO RESERVOIR

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

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	0.13	0.0	0.13	0.0	0.0	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
72	0.0	0.0	0.0

PRECIP PATTERN

0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.0
0.02	0.02	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.0
0.03	0.04	0.04	0.04	0.05	0.05	0.10	0.10	0.10	0.1
0.10	0.13	0.23	0.24	0.48	0.80	0.42	0.23	0.14	0.1
0.10	0.10	0.10	0.10	0.06	0.05	0.05	0.04	0.04	0.0
0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.0
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.0
0.02	0.02								

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.0	0.0	1.00	0.0	0.0	1.00	0.50	0.10	0.0	0.0

GIVEN UNIT GRAPH, NUHGG= 5

670. 274. 75. 21. 6.

UNIT GRAPH TOTALS 1046. CFS OR 1.04 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.0 QRCSN= 0.0 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.02	0.00	0.
2	0.02	0.00	0.
3	0.02	0.00	0.
4	0.02	0.00	0.
5	0.02	0.00	0.

LOUIS BERGER & ASSOCIATES INC.

N.J. NO DAME DO. 14 DAM

6	0.02	0.00	0.
7	0.02	0.00	0.
8	0.02	0.00	0.
9	0.02	0.00	0.
10	0.02	0.00	0.
11	0.02	0.00	0.
12	0.02	0.00	0.
13	0.03	0.00	0.
14	0.02	0.00	0.
15	0.03	0.00	0.
16	0.03	0.00	0.
17	0.03	0.00	0.
18	0.03	0.00	0.
19	0.03	0.00	0.
20	0.03	0.00	0.
21	0.03	0.00	0.
22	0.04	0.03	21.
23	0.04	0.03	30.
24	0.04	0.03	32.
25	0.05	0.04	40.
26	0.05	0.04	43.
27	0.10	0.09	77.
28	0.10	0.09	91.
29	0.10	0.09	95.
30	0.10	0.09	96.
31	0.10	0.09	96.
32	0.13	0.12	116.
33	0.23	0.22	191.
34	0.24	0.23	228.
35	0.48	0.47	399.
36	0.80	0.79	682.
37	0.42	0.41	534.
38	0.23	0.22	332.
39	0.14	0.13	199.
40	0.13	0.12	148.
41	0.10	0.09	112.
42	0.10	0.09	100.
43	0.10	0.09	97.
44	0.10	0.09	96.
45	0.06	0.05	69.
46	0.05	0.04	51.
47	0.05	0.04	46.
48	0.04	0.03	37.
49	0.04	0.03	34.
50	0.03	0.02	27.
51	0.03	0.02	24.
52	0.03	0.02	23.
53	0.03	0.02	23.
54	0.03	0.02	23.
55	0.03	0.02	23.
56	0.03	0.02	23.
57	0.02	0.01	16.
58	0.02	0.01	13.
59	0.02	0.01	12.
60	0.02	0.01	12.
61	0.02	0.01	12.
62	0.02	0.01	12.
63	0.02	0.01	12.
64	0.02	0.01	12.
65	0.02	0.01	12.
66	0.02	0.01	12.

67	0.02	0.01	12.
68	0.02	0.01	12.
69	0.02	0.01	12.
70	0.02	0.01	12.
71	0.02	0.01	12.
72	0.02	0.01	12.
73	0.0	0.0	4.
74	0.0	0.0	1.
75	0.0	0.0	0.
76	0.0	0.0	0.
77	0.0	0.0	0.
78	0.0	0.0	0.
79	0.0	0.0	0.
80	0.0	0.0	0.
81	0.0	0.0	0.
82	0.0	0.0	0.
83	0.0	0.0	0.
84	0.0	0.0	0.
85	0.0	0.0	0.
86	0.0	0.0	0.
87	0.0	0.0	0.
88	0.0	0.0	0.
89	0.0	0.0	0.
90	0.0	0.0	0.
91	0.0	0.0	0.
92	0.0	0.0	0.
93	0.0	0.0	0.
94	0.0	0.0	0.
95	0.0	0.0	0.
96	0.0	0.0	0.
97	0.0	0.0	0.
98	0.0	0.0	0.
99	0.0	0.0	0.
100	0.0	0.0	0.
SUM	5.19	4.18	4460.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	682.	62.	45.	45.	4461.
INCHES		4.43	4.43	4.43	4.43
AC-FT		31.	31.	31.	31.

HYDROGRAPH ROUTING

ROUTING THROUGH RESERVOIR

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

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

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

STORAGE=	0.	9.	17.	26.	36.	45.	55.	65.	75.	85.
OUTFLOW=	0.	6.	9.	27.	66.	124.	204.	591.	1223.	2017.

BY D.J.M. DATE 6-77

CHKD. BY _____ DATE _____

SUBJECT _____

LOUIS BERGER & ASSOCIATES INC.

N.J. NO NAME NO. 14 DAM

SHEET NO. A14 OF

PROJECT C-234

TIME	EOP STOR	AVG IN	EOP OUT
1	0.	0.	0.
2	0.	0.	0.
3	0.	0.	0.
4	0.	0.	0.
5	0.	0.	0.
6	0.	0.	0.
7	0.	0.	0.
8	0.	0.	0.
9	0.	0.	0.
10	0.	0.	0.
11	0.	0.	0.
12	0.	0.	0.
13	0.	0.	0.
14	0.	0.	0.
15	0.	0.	0.
16	0.	0.	0.
17	0.	0.	0.
18	0.	0.	0.
19	0.	0.	0.
20	0.	0.	0.
21	0.	0.	0.
22	0.	11.	0.
23	0.	26.	0.
24	0.	31.	0.
25	1.	36.	0.
26	1.	41.	1.
27	1.	60.	1.
28	2.	84.	1.
29	3.	93.	2.
30	3.	95.	2.
31	4.	96.	3.
32	5.	106.	3.
33	6.	154.	4.
34	7.	209.	5.
35	9.	313.	6.
36	13.	541.	7.
37	17.	608.	9.
38	20.	433.	15.
39	22.	266.	18.
40	23.	173.	20.
41	23.	130.	22.
42	24.	106.	23.
43	24.	98.	24.
44	25.	96.	25.
45	25.	83.	26.
46	26.	60.	26.
47	26.	49.	27.
48	26.	42.	27.
49	26.	36.	27.
50	26.	30.	27.
51	26.	25.	27.
52	26.	23.	27.
53	26.	23.	27.
54	26.	23.	27.
55	26.	23.	27.
56	26.	23.	27.
57	26.	19.	27.
58	26.	15.	26.
59	26.	13.	26.
60	25.	12.	26.

LOUIS BERGER & ASSOCIATES INC.

N.J. NONAME #14 DAM

61	25.	12.	26.
62	25.	12.	26.
63	25.	12.	25.
64	25.	12.	25.
65	25.	12.	25.
66	25.	12.	25.
67	25.	12.	25.
68	25.	12.	25.
69	25.	12.	24.
70	25.	12.	24.
71	25.	12.	24.
72	24.	12.	24.
73	24.	8.	24.
74	24.	3.	23.
75	24.	1.	23.
76	24.	0.	23.
77	24.	0.	22.
78	24.	0.	22.
79	23.	0.	22.
80	23.	0.	22.
81	23.	0.	21.
82	23.	0.	21.
83	23.	0.	21.
84	23.	0.	20.
85	23.	0.	20.
86	22.	0.	20.
87	22.	0.	20.
88	22.	0.	19.
89	22.	0.	19.
90	22.	0.	19.
91	22.	0.	19.
92	22.	0.	18.
93	22.	0.	18.
94	21.	0.	18.
95	21.	0.	18.
96	21.	0.	17.
97	21.	0.	17.
98	21.	0.	17.
99	21.	0.	17.
100	21.	0.	16.
SUM			1468.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	27.	20.	15.	15.	1468.
INCHES		1.45	1.46	1.46	1.46
AC-FT		10.	10.	10.	10.

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	1	682.	62.	45.	45.	0.13
ROUTED TO	11	27.	20.	15.	15.	0.13