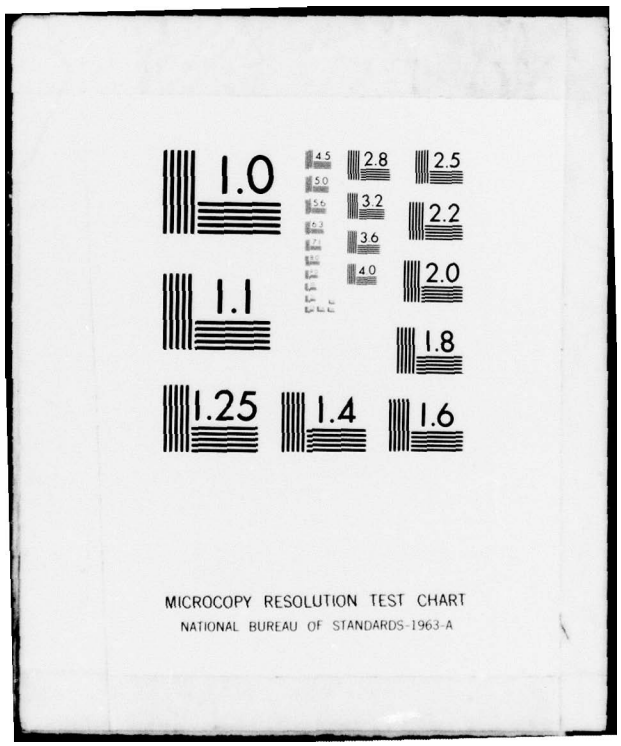
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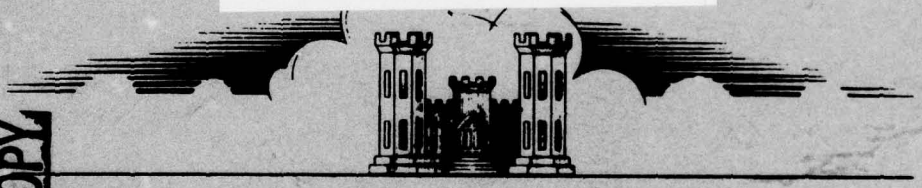
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LEVEL

WYOMING COUNTY, PENNSYLVANIA

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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PREFACE

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

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

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

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design 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.

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PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

BRIEF ASSESSMENT OF GENERAL CONDITIONS
AND RECOMMENDATIONS

Name of Dam: SADDLE LAKE DAM, NDI NO. PA-00895

State & State No. PENNSYLVANIA, 66-56

County: WYOMING

Stream: OSTERHOUT CREEK

Date of Inspection: June 20, 1979

Based upon the visual inspection, past performance and the available engineering date, the dam and its appurtenant structures appear to be in fair condition.

In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small and the hazard classification is high. The combined reservoir storage and spillway capacity is adequate to pass the PMF (Probable Maximum Flood) peak inflow without overtopping the dam. The spillway capacity is considered to be adequate.

The following recommendations are made for action by the owner:

1. That the trees, brush, and weeds be removed from the embankment slopes and to ten feet downstream from the toe of the embankment and that a close inspection of the slope surface be made at that time.

2. That the trees, brush and weeds be removed from the spillway outlet channel and stilling basin.

3. That the wet condition located to the right of the outlet structure be examined after removal of trees, brush and weeds to identify its source and that regular observations be made noting flow and clarity. If changes are noticed take immediate steps to correct the condition.

4. That a means for providing an upstream closure control on the intake structure be developed and installed.

(15) DACW31-79-C-0012

5. That a formal surveillance and downstream warning system be developed to be used during periods of heavy or prolonged precipitation.

6. That a schedule of regular maintenance of the dam be developed and implemented including slope clearance and operation of the control gate on at least an annual basis.

SUBMITTED BY:

BERGER ASSOCIATES, INC.
HARRISBURG, PA

DATE: August 24, 1979

APPROVED BY:

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

DATE: 17 Sep 79



(6) National Dam Inspection Program. Saddle Lake Dam (NDS Number PA-00895, DER Number 66-56) Susquehanna River Basin, Wyoming County, Pennsylvania. Phase I Inspection Report.

(11) Aug 79

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OVERVIEW

SADDLE LAKE DAM

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

SADDLE LAKE DAM

NDI-ID NO. PA-00895
DER-ID NO. 66-56

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

A. Authority

The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspections of dams throughout the United States.

B. Purpose

The purpose is to determine if the dam constitutes a hazard to human life and property.

1.2 DESCRIPTION OF PROJECT

A. Description of Dam and Appurtenances

The Saddle Lake Dam is a homogeneous earthfill structure with an earthfilled cutoff trench at the center of the embankment foundation. The top of the dam embankment is 24 feet above the streambed elevation. The main embankment is 350 feet in length to where it meets a natural high knoll at its right abutment. The knoll is about 100 feet across beyond which a second embankment section has been constructed extending approximately another 400 feet to the right where it abuts the natural ground surface. ~~Refer to Appendix F, Plate III for~~ plan view.

An uncontrolled concrete triangular weir spillway is located at the left abutment of the main embankment. The approach to the spillway is through a 45 foot wide approach channel from the left side of the reservoir. This channel is a 90° curved section about 200 feet in length.

The spillway outlet channel has a concrete slab and 2H to 1V sloped concrete side walls and extends 57 feet downstream from the crest of the weir. Beyond this point, the channel is paved with riprap including a stilling basin about 200 feet further downstream.

The blowoff facility consists of an 18-inch diameter steel pipe with a downstream control. The submerged entrance invert is elevation 935 and the discharge invert, downstream of the valve house is elevation 932.5. The valve house is located approximately 220 feet to the right of the spillway wall near the toe of the downstream embankment. It is a concrete structure with a removal timber roof. Access to the inside of the control house is gained by moving the roof to the side and descending a permanently anchored steel ladder. An 18-inch gate valve controls the flow through this outlet. Refer to Appendix F for selected drawings and Appendix E for photographs. The dam reservoir is used as a recreational lake for the surrounding residential community.

B. Location: Tunkhannock Township, Wyoming County
U.S.G.S. Quadrangle, Factoryville, Pa.
Latitude: 41°-37.3', Longitude: 75°-51.9'
(Refer to Appendix F, Plates I and II)

C. Size Classification: Small: Height - 24 feet.
Volume - 357 acre-feet.

D. Hazard Classification: High (See Section 3.1.E).

E. Ownership: Saddle Lake, Inc.
R. D. #5
Tunkhannock, Pa. 18657

F. Purpose: Recreation

G. Design and Construction History

The Saddle Lake Dam, as constructed, was designed by John R. Kearney, Registered Professional Engineer of Dunmore, Pennsylvania. The facility was constructed in 1964-65 by the owner-contractor J. Mark Robinson of Tankhannock, Pennsylvania. Stripping of the project area was begun in June, 1964 and the construction was completed in November, 1965.

H. Normal Operating Procedures

There is no operating procedure for this dam. Its sole purpose is recreational and the water level is controlled by runoff flow and natural springs underlying the lake.

1.3 PERTINENT DATA

A. Drainage Area (square miles)

Computed for this report	0.40

	Design Engineer's Value	0.53
B.	Discharge at Dam Site (cubic feet per second) See Appendix C for calculations	
	Maximum observed flood at dam site. Date unknown.	10
	Warm water outlet	None
	Blowoff pipe at low pool elevation 940	18
	Blowoff pipe at normal pool elevation 952	34
	Spillway capacity at maximum pool elevation 957	1,870
C.	Elevation (feet above mean sea level)	
	Top of dam (design)	957
	Low point in embankment	956.9
	Normal pool	952
	Upstream portal invert of blowoff pipe; about	935
	Downstream portal invert of blowoff pipe; about	932.5
	Streambed at centerline of dam; about	933
D.	Reservoir (miles)	
	Length of maximum pool	.7
	Length of normal pool	.6
E.	Storage (acre-feet)	
	Spillway crest (Elev. 952)	175
	Top of dam (Elev. 957)	357
F.	Reservoir Surface (acres)	
	Top of dam (Elev. 957)	44.8
	Spillway crest (Elev. 952)	29.4

G. Dam

For general plan and typical sections refer to Appendix F, Plates III and IV.

Type: Homogeneous earthfill.

Length: 850 feet.

Height: 24 feet.

Top Width: 16 and 21 feet (design).

Side Slope: Design: 3H to 1V (upstream & downstream)
Surveyed: Upstream 2.76H to 1V.
Downstream 2.85H to 1V.

Zoning: None.

Impervious Core: None.

Cutoff: Cutoff trench excavated to rock.

Grout Curtain: None.

H. Outlet Conduit

One 18-inch blowoff pipe with a 18-inch gate near downstream toe.

I. Spillway

Type: Uncontrolled triangular weir with chute constructed of concrete slabs and walls having 2:1 slope on each side.

Length: 44 feet at crest.

Crest elevation: 952.0.

J. Regulating Outlet

See Section 1.3.H.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

The engineering design information which has been located in the PennDER files and from the owner is limited to summary data tabulated on the design drawings. Hydraulic design data and test pit descriptions are included. There are no slope or structural stability calculations or hydrologic or detailed hydraulic computations.

2.2 CONSTRUCTION

Information regarding the construction of the dam is recorded in the PennDER inspection reports. Considerable guidance was given to the owner during the construction period, relative to placement of embankment materials and modifications to the design plans because of actual field conditions differing from the design assumptions. Plate V, Appendix F, reflects final design.

2.3 OPERATION

There are no operation or maintenance records in the PennDER files or with the owner. The dam and reservoir are used as a recreation lake by the surrounding residential development. Operational intentions are to keep the reservoir water surface level as near the spillway crest as possible.

2.4 EVALUATION

A. Availability

The engineering data available for examination includes design drawings, summary hydraulic information, inspection reports, and general correspondence, all in the PennDER files.

B. Adequacy

The design drawings, summary data along with the observed conditions and subsequent calculations are sufficient to make a reasonable assessment of the overall conditions of the dam.

C. Operating Records

Formal operating records are not maintained for this dam. The owner's representative reported that the maximum flow observed over the spillway was about one inch, time unknown.

D. Post Construction Changes

There have been no modifications to this facility since the completion of construction in 1965.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

A. General

The general appearance of the Saddle Lake Dam is fair. This description is based upon the heavy growth of weeds, brush and trees on the slopes and in the spillway outlet channel. Maintenance of the embankment slopes has been minimal. The control valve for the outlet pipe was opened for this inspection. It was operated satisfactorily by one man. The visual inspection check list is in Appendix A of this report. Photographs taken during the inspection are reproduced in Appendix E.

B. Embankment

The heavy growth on the embankment slopes did not permit close inspection of the slope surfaces. This condition applies to both sections of the embankment on either side of the knoll.

The top of the embankment is partially covered by the deteriorated remains of a bituminous paved surface. The field measured slope ratios are 2.76H to 1V upstream and 2.85H to 1V downstream as compared to 3H to 1V for both slopes on the design drawings.

Water was observed at one area to the right of the outlet channel downstream from the toe. The water was stagnant and flow was not detected. Inspection along the toe did not detect any other wet or seepage areas.

The major portion of the crest of the dam, on the basis of the results of the field survey, is above the crest design elevation of 957.0. One exception is a low point, 956.9, on the right segment of the embankment. Refer to Appendix A, Plate A-II.

C. Appurtenant Structures

The appurtenant structures for this facility include a concrete triangular weir, concrete paved outlet channel, concrete valve house, and concrete intake and outlet structures.

The spillway and its outlet slab and sloped walls did not show any serious deterioration or cracks. The outlet slab slopes gently to its terminus 57 feet downstream from the crest of the spillway. The spillway outlet channel continues beyond the concrete and is paved with riprap, including the side slopes to a stilling basin approximately 250

feet downstream. The riprapped portion of this channel and the stilling basin is grown over with a dense cover of brush and small trees. As a result, the condition of the channel could not be determined by visual inspection.

The concrete intake structure is submerged. The valve house, which controls the flow through the 18-inch steel pipe, is located near the downstream toe of the embankment. The house is a concrete structure with a tar paper covered wooden removable roof. The roof is vented. Access to the house is gained by sliding the roof to one side and descending a ladder made of reinforcing bars and imbedded into the concrete. The owner's representative entered the valve house and operated the 18-inch gate valve for the inspection. It was operated satisfactorily.

The outlet structure is a concrete endwall which discharges into a narrow shallow ditch. This ditch is not very well defined. The general area downstream from the dam is swampy. This condition is attributed to natural springs throughout this area.

D. Reservoir Area

The reservoir surface area is about 29 acres. The land surrounding this area is mostly wooded with some open fields along the right side. The slopes are gentle in the open areas and moderate in the woodlands. There is no evidence of erosion and the area appears stable. Sedimentation has not been reported as a problem.

E. Downstream Channel

Saddle Lake Dam is situated at the headwaters of Osterhout Creek. The area immediately downstream from the dam has very flat overbanks and is reported by the owners representative to have been a swamp prior to the construction of the dam. The overbank areas in the flood plain are wooded for about one-half mile downstream where the stream crosses under a Township Road. Beyond this point there are some residences near the stream and some of the overbank area is cleared. Because of the hazard to roadway traffic and more than a few residents in this area, in the event of a dam break, the hazard classification of the dam is "High".

3.2 EVALUATION

On the basis of the visual observations the Saddle Lake Dam is in fair condition. This classification is based primarily on the density of weeds, brush and small trees on the slopes and in the spillway outlet channel. The wet and stagnant water condition of the water should be closely observed on a regular schedule. Its source should be identified after the slope cover has been removed. The control for the outlet pipe is downstream. Consideration should be given to provide a control at the submerged intake structure.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

Other than attempting to maintain the water level at the spillway crest elevation, there are no operating procedures for this dam.

4.2 MAINTENANCE OF DAM

There is no regular maintenance schedule for the dam. The slope cover needs to be cut and the spillway outlet channel and the stilling basin need to be cleared of brush and trees.

4.3 MAINTENANCE OF OPERATING FACILITIES

The operational facility for Saddle Lake Dam includes the outlet control valve. This valve is operated occasionally but not on any regular schedule. It was operated satisfactorily at the time of this inspection.

4.4 WARNING SYSTEM

There is no formally organized surveillance or downstream warning system in operation for this dam.

4.5 EVALUATION

As noted above, there is no planned or regularly scheduled operation or maintenance of the dam, and there is no surveillance or warning system in operation. The observed condition of the facility points out the need for the development and implementation of a regular maintenance and operation plan.

SECTION 5 - HYDROLOGY/HYDRAULICS

5.1 EVALUATION OF FEATURES

A. Design Data

The hydrologic and hydraulic analyses available from PennDER for Saddle Lake Dam were not very extensive. No frequency curve, unit hydrograph, nor flood routings were submitted by the designer to PennDER. The files indicated that the spillway had the capacity to pass the "C" curve flow of 800 cfs with about 1.7 feet of freeboard.

B. Experience Data

The greatest flow since completion of the dam has occurred on several occasions when the depth of flow over the spillway weir was about 2 inches. The project passed those small rises without any damage.

C. Visual Observations

On the date of the inspection, no conditions were observed that would indicate that the appurtenant structures of the dam could not operate satisfactorily during a flood event, until the dam is overtopped.

D. Overtopping Potential

Saddle Lake Dam has a total storage capacity of 357 acre-feet and an overall height of 24 feet, both referenced to the top of the dam. These dimensions indicate a size classification of "Small", The hazard classification is "High" (see Section 3.1.E).

The recommended Spillway Design Flood (SDF) for a dam having the above classifications is one-half the Probable Maximum Flood to the Probable Maximum Flood (PMF). For this dam, the PMF peak inflow is 2,189 cfs (see Appendix C for HEC-1 inflow computations).

Comparison of the estimated PMF peak inflow of 2,189 cfs with the estimated spillway discharge capacity of 1,870 cfs indicates that a potential for overtopping of the Saddle Lake Dam exists.

An estimate of the storage effect of the reservoir and routing of the computed inflow hydrograph through the reservoir shows that this dam has the necessary storage available to pass the PMF without overtopping.

E. Spillway Adequacy

The small size and high hazard categories, in accordance with the Corps of Engineers criteria and guidelines, indicates that the Spillway Design Flood (SDF) for this dam should be one-half the Probable Maximum Flood to the full Probable Maximum Flood (PMF).

Calculations show that the spillway discharge capacity and reservoir storage capacity combine to handle the full PMF with about 0.9 foot of freeboard (Refer to Appendix C).

Since the spillway discharge and reservoir storage capacity can pass the full PMF without overtopping, the spillway is considered to be adequate.

The hydrologic analysis for this investigation was based upon existing conditions of the watershed. The effects of future development were not considered.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

A. Visual Observations

1. Embankment

Because of the dense cover on the embankment slopes of the Saddle Lake Dam, the condition of the slope surface could not be closely observed. There were no cracks or obvious areas of settlement on the crest. The crest serves as an access road to the control house and to the spillway. The embankment crest elevation is above the design elevation except at one point where it is 0.1 foot below. The field measured slopes are 2.76H to 1V upstream and 2.85H to 1V downstream as compared to 3H to 1V design ratios for both slopes. As near as could be determined, there were no signs of heaving or settlement and the slopes are judged to be stable.

Again, the slope cover should be cut and the slope surface should be examined closely at that time.

The wet spot with stagnant water to the right of the outlet structure and downstream from the toe of the embankment does not appear to have influence on the stability of the embankment. There was no overland flow noticed from this location and the remainder of the surface along the toe was dry. The numerous natural springs in this locale suggest this may have developed from one such spring. Its source should be identified when the slope cover is removed and the condition should be observed on a regular schedule to detect any change in flow or clarity.

2. Appurtenant Structures

The appurtenant structures for Saddle Lake Dam include the spillway and its outlet channel, the intake structure, outlet pipe, valve house and outlet structure.

The intake structure is submerged and could not be observed. The outlet conduit is an 18-inch steel pipe which is controlled by an 18-inch gate valve in the valve house. All features appear in stable condition based upon the operation of the gate valve and the discharge at the outlet structure at the time of this inpsection.

The spillway and its outlet channel did not show any signs of structural distress or instability. The discharge channel, however, needs to be cleared of weeds, shrubs and small tree growth.

B. Design and Construction Data

There are no slope stability or structural stability calculations on record in the PennDER files or with the owner. Hydraulic design and test pit exploration information is summarized on the design drawings.

Construction data are limited to PennDER inspection reports. The information does not indicate any special stability problems.

C. Operating Records

There are no operating records for this dam.

D. Post Construction Changes

There have been no changes made to this facility since its completion in 1965.

E. Seismic Stability

This dam is located in Seismic Zone 1 and it is considered that the static stability is sufficient to withstand minor earthquake induced dynamic forces. No studies or calculations have been made to confirm this assumption.

SECTION 7 - ASSESSMENT & RECOMMENDATIONS

7.1 DAM ASSESSMENT

A. Safety

The visual inspection, the review of the design drawings and the historical records of the development and operation indicates that this dam is in fair condition. The inspection did not detect any signs of major distress on or in the vicinity of the embankment. There were signs of seepage as evidenced by stagnant water in the area to the right of the outlet structure. Items which require maintenance attention include trees, brush and weeds from both slope areas, and from the spillway outlet channel.

In accordance with the Corps of Engineers evaluation guidelines, the combination of storage and spillway capacity is sufficient for passing the full PMF. The spillway is considered to be adequate.

B. Adequacy of Information

Although the available engineering data are not sufficient to make a detailed analysis of the stability of the dam and its appurtenant structures, the available drawings, reports and the observed physical conditions are judged sufficient for making a reasonable assessment of the overall condition of the dam.

C. Urgency

The recommendations presented below should be implemented without delay.

D. Necessity for Additional Studies

Additional studies are not required at this time.

7.2 RECOMMENDATIONS

A. Facilities

In order to assure the continued satisfactory operation of this dam, the following recommendations are presented for implementation by the owner:

1. That the trees, brush, and weeds be removed from the embankment slopes and to ten feet downstream from the toe of the embankment and that a close inspection of the slope surface be made at that time.

2. That the trees, brush and weeds be removed from the spillway outlet channel and stilling basin.

3. That the wet condition located to the right of the outlet structure be examined after removal of trees, brush and weeds to identify its source and that regular observations be made noting flow and clarity. If changes are noticed take immediate steps to correct the condition.

4. That a means for providing an upstream closure control on the intake structure be developed and installed.

B. Operation and Maintenance Procedures

1. That a formal surveillance and downstream warning system be developed to be used during periods of heavy or prolonged precipitation.

2. That a schedule of regular maintenance of the dam be developed and implemented including slope clearance and operation of the control gate on at least an annual basis.

APPENDIX A

CHECKLIST OF VISUAL INSPECTION REPORT

CHECK LIST

PHASE I - VISUAL INSPECTION REPORT

PA DER # 66-56 NDI NO. PA-00 895

NAME OF DAM Saddle Lake Dam HAZARD CATEGORY High

TYPE OF DAM Earth Embankment

LOCATION Tunkhannock TOWNSHIP Wyoming COUNTY, PENNSYLVANIA

INSPECTION DATE 6-20-79 WEATHER Sunny TEMPERATURE 70's

INSPECTORS: R. Houseal (Recorder) OWNER'S REPRESENTATIVE(s):

H. Jongsma James Robinson

R. Shireman

J. Watson

NORMAL POOL ELEVATION: 952 AT TIME OF INSPECTION:

BREAST ELEVATION: 957 POOL ELEVATION: 952

SPILLWAY ELEVATION: 952 TAILWATER ELEVATION:

MAXIMUM RECORDED POOL ELEVATION: Spillway + 1" (time unknown)

GENERAL COMMENTS:

Valve opened about 4 years ago. Opened today for inspection. No maintenance program. This is the headwater for the stream. Springs feed the lake as the only source of water.

Downstream area reported to have been a swamp prior to construction of the dam.

NDI NO. PA-00895

VISUAL INSPECTION
EMBANKMENT

	OBSERVATIONS AND REMARKS
A. SURFACE CRACKS	None evident. Slopes completely covered with heavy growth of weeds and brush and some small trees.
B. UNUSUAL MOVEMENT BEYOND TOE	None observed - heavy stand of trees and brush downstream of toe.
C. SLOUGHING OR EROSION OF EMBANKMENT OR ABUTMENT SLOPES	None detectable - cover too thick to observe slope conditions.
D. ALIGNMENT OF CREST: HORIZONTAL: VERTICAL:	Horizontal appears good. Vertical - see Plate A-II, Appendix A.
E. RIPRAP FAILURES	None observed - weed growth too thick to waters edge.
F. JUNCTION EMBANKMENT & ABUTMENT OR SPILLWAY	Appears sound in all areas.
G. SEEPAGE	Stagnant water at toe of downstream slope near right abutment - no observed flow. No seepage evident on downstream slope. Toe area other than that above appears dry.
H. DRAINS	None visible.
J. GAGES & RECORDER	None.
K. COVER (GROWTH)	Upstream - trees, brush and weeds - some large rocks visible. Top - paved roadway - bituminous - deteriorated Downstream - trees, brush and weeds.

NDI NO. PA-00 895

VISUAL INSPECTION
OUTLET WORKS

	OBSERVATIONS AND REMARKS
A. INTAKE STRUCTURE	Submerged. No upstream control.
B. OUTLET STRUCTURE	Concrete endwall with 18" cast iron pipe from valve house. Valve house has a wooden cover with access ladder inside and is located at toe of downstream slope.
C. OUTLET CHANNEL	Narrow ditch with overgrowth of brush (24" wide ±) Stagnant water.
D. GATES	18" gate valve in valve house at toe of downstream slope.
E. EMERGENCY GATE	As above.
F. OPERATION & CONTROL	None.
G. BRIDGE (ACCESS)	None.

NDI NO. PA-00 895

VISUAL INSPECTION
SPILLWAY

	OBSERVATIONS AND REMARKS
A. APPROACH CHANNEL	From left side of reservoir - 90° curve unobstructed.
B. WEIR: Crest Condition Cracks Deterioration Foundation Abutments	Triangular weir with sloping apron (concrete). No serious displacement or cracks. Side walls - concrete sloped - apron narrows toward downstream side. Water not flowing over weir - surface just at crest.
C. DISCHARGE CHANNEL: Lining Cracks Stilling Basin	Beyond concrete apron, the channel is overgrown with heavy stand of weeds, and small trees. Curved to right. Plunge pool at end of channel in natural stream. Condition not observed due to heavy growth of brush.
D. BRIDGE & PIERS	None.
E. GATES & OPERATION EQUIPMENT	None.
F. CONTROL & HISTORY	None.

NDI NO. PA-00 895

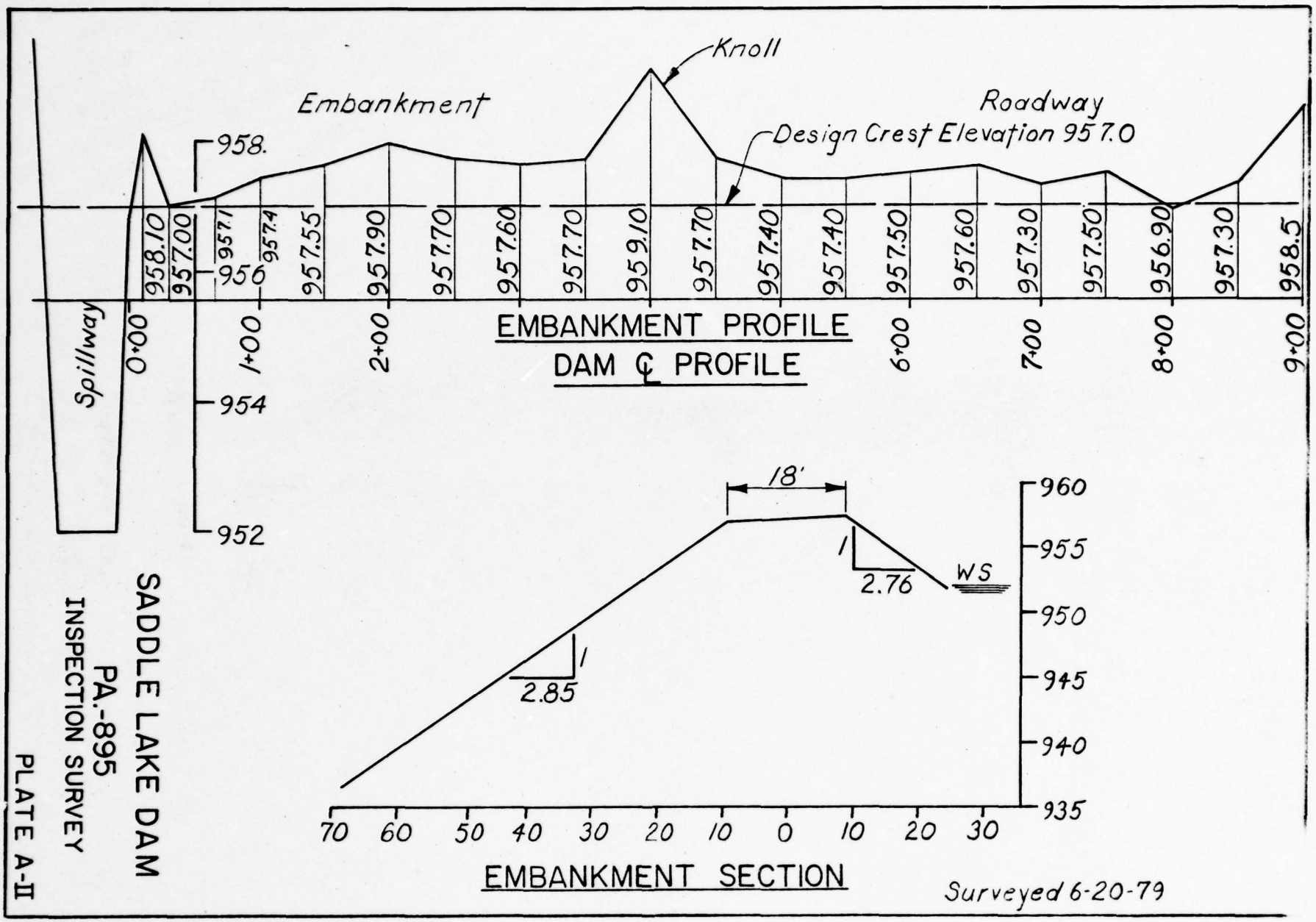
VISUAL INSPECTION

	OBSERVATIONS AND REMARKS
INSTRUMENTATION Monumentation	None.
Observation Wells	None.
Weirs	None.
Piezometers	None.
Staff Gauge	None.
Other	None.
RESERVOIR Slopes	Mostly wooded - some grassed areas.
Sedimentation	None reported.
Watershed Description	Mostly wooded.
DOWNSTREAM CHANNEL Condition	Marsh land over broad wooded area. Heavily overgrown - this area is source of any flow.
Slopes	Relatively flat and wooded.
Approximate Population	12 to 15 plus roadway traffic.
No. Homes	Township Road plus three to four residences.

Surveyed 6-20-79

SADDLE LAKE DAM
PA.895
INSPECTION SURVEY

PLATE A-I



SADDLE LAKE DAM
PA.-895
INSPECTION SURVEY
PLATE A-II

APPENDIX B

CHECKLIST OF ENGINEERING DATA

CHECK LIST
ENGINEERING DATA

PA DER # 66-56 NDI NO. PA-00 895

NAME OF DAM Saddle Lake Dam

ITEM	REMARKS
AS-BUILT DRAWINGS	None.
REGIONAL VICINITY MAP	U.S.G.S. Quadrangle, Factoryville, Pa. See Plate II, Appendix F
CONSTRUCTION HISTORY	PennDER Inspection Reports and correspondence.
GENERAL PLAN OF DAM	Design plans in PennDER files.
TYPICAL SECTIONS OF DAM	Design plans in PennDER files.
OUTLETS: PLAN DETAILS CONSTRAINTS DISCHARGE RATINGS	Design plans in PennDER files.

NDI NO. PA-00 895

ENGINEERING DATA

ITEM	REMARKS
RAINFALL & RESERVOIR RECORDS	None.
DESIGN REPORTS	None.
GEOLOGY REPORTS	None. Soils consultant reports on field investigations during construction.
DESIGN COMPUTATIONS: HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	Hydraulic data summarized on design drawings. No stability or seepage information.
MATERIALS INVESTIGATIONS: BORING RECORDS LABORATORY FIELD	Test pits dug with a backhoe. Laboratory density tests and a few field density tests.
POST CONSTRUCTION SURVEYS OF DAM	None.
BORROW SOURCES	Not identified.

NDI NO. PA-00 895

ENGINEERING DATA

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	Spillway design modified during construction to accommodate field conditions.
HIGH POOL RECORDS	None.
POST CONSTRUCTION ENGINEERING STUDIES & REPORTS	None.
PRIOR ACCIDENTS OR FAILURE OF DAM Description: Reports:	None.
MAINTENANCE & OPERATION RECORDS	None - recreation dam for residential development.
SPILLWAY PLAN, SECTIONS AND DETAILS	Revised plan included in the PennDER drawings.

NDI NO. PA-00 895

ENGINEERING DATA

ITEM	REMARKS
OPERATING EQUIPMENT, PLANS & DETAILS	Construction drawings.
CONSTRUCTION RECORDS	PennDER files.
PREVIOUS INSPECTION REPORTS & DEFICIENCIES	
MISCELLANEOUS	

NDI NO. PA-00 895

CHECK LIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: Woodland and open fields

ELEVATION:

TOP NORMAL POOL & STORAGE CAPACITY: Elev. 952 175 Acre-Feet

TOP FLOOD CONTROL POOL & STORAGE CAPACITY: Elev. 957 357 Acre-Feet

MAXIMUM DESIGN POOL: Elev. 955.25

TOP DAM: Elev. 957

SPILLWAY:

a. Elevation 952

b. Type Concrete broadcrested weir.

c. Width 44 feet.

d. Length Chute 57 feet

e. Location Spillover Left abutment.

f. Number and Type of Gates None.

OUTLET WORKS:

a. Type Submerged intake.

b. Location Near center of embankment at downstream toe.

c. Entrance inverts 933

d. Exit inverts 937.5

e. Emergency drawdown facilities 18 inch pipe

HYDROMETEOROLOGICAL GAGES:

a. Type None.

b. Location

c. Records

MAXIMUM NON-DAMAGING DISCHARGE: No record.

APPENDIX C

HYDROLOGY AND HYDRAULIC CALCULATIONS

SUMMARY DESCRIPTION
OF
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION

The hydrologic and hydraulic evaluation for this inspection report has employed computer techniques using the Corps of Engineers computer program identified as the Flood Hydrograph Package (HEC-1) Dam Safety Version.

The program has been designed to enable the user to perform two basic types of hydrologic analyses: (1) the evaluation of the overtopping potential of the dam, and (2) the capability to estimate the downstream hydrologic-hydraulic consequences resulting from assumed structural failures of the dam. A brief summary of the computation procedures typically used in the dam overtopping analysis is shown below.

- Development of an inflow hydrograph to the reservoir.
- Routing of the inflow hydrograph(s) through the reservoir to determine if the event(s) analyzed would overtop the dam.
- Routing of the outflow hydrograph(s) of the reservoir to desired downstream locations. The results provide the peak discharge, time of the peak discharge and maximum stage of each routed hydrograph at the outlet of the reach.

The output data provided by this program permits the comparison of downstream conditions just prior to a breach failure with that after a breach failure and the determination as to whether or not there is a significant increase in the hazard to loss of life as a result of such a failure.

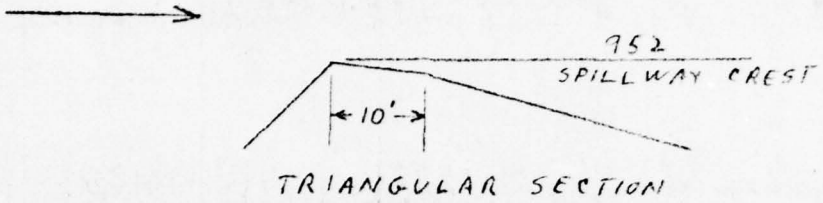
The results of the studies conducted for this report are presented in Section 5.

For detailed information regarding this program refer to the Users Manual for the Flood Hydrograph Package (HEC-1) Dam Safety Version prepared by the Hydrologic Engineering Center, U. S. Army Corps of Engineers, Davis, California.

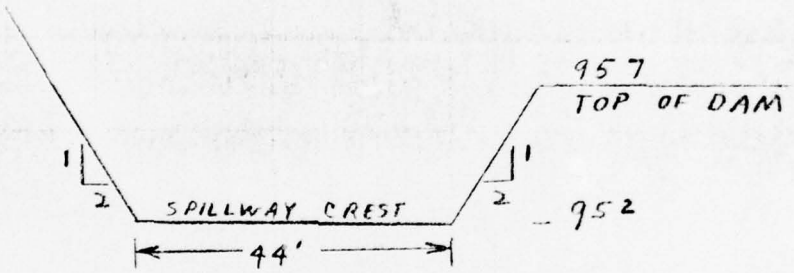
CHKD. BY _____ DATE _____ BERGER ASSOCIATES PROJECT 089-10

SUBJECT SADDLE LAKE

SPILLWAY RATING



C = 3.1 (ESTIMATED FROM KING'S HDBK.)



C = 3.1

$$L = \frac{(44 + 44 + (2 \times 5 \times 2))}{2} = 54$$

H = 957 - 952 = 5'

$$Q = C L H^{3/2}$$

$$= 3.1 \times 54 \times (5)^{1.5} = 1872$$

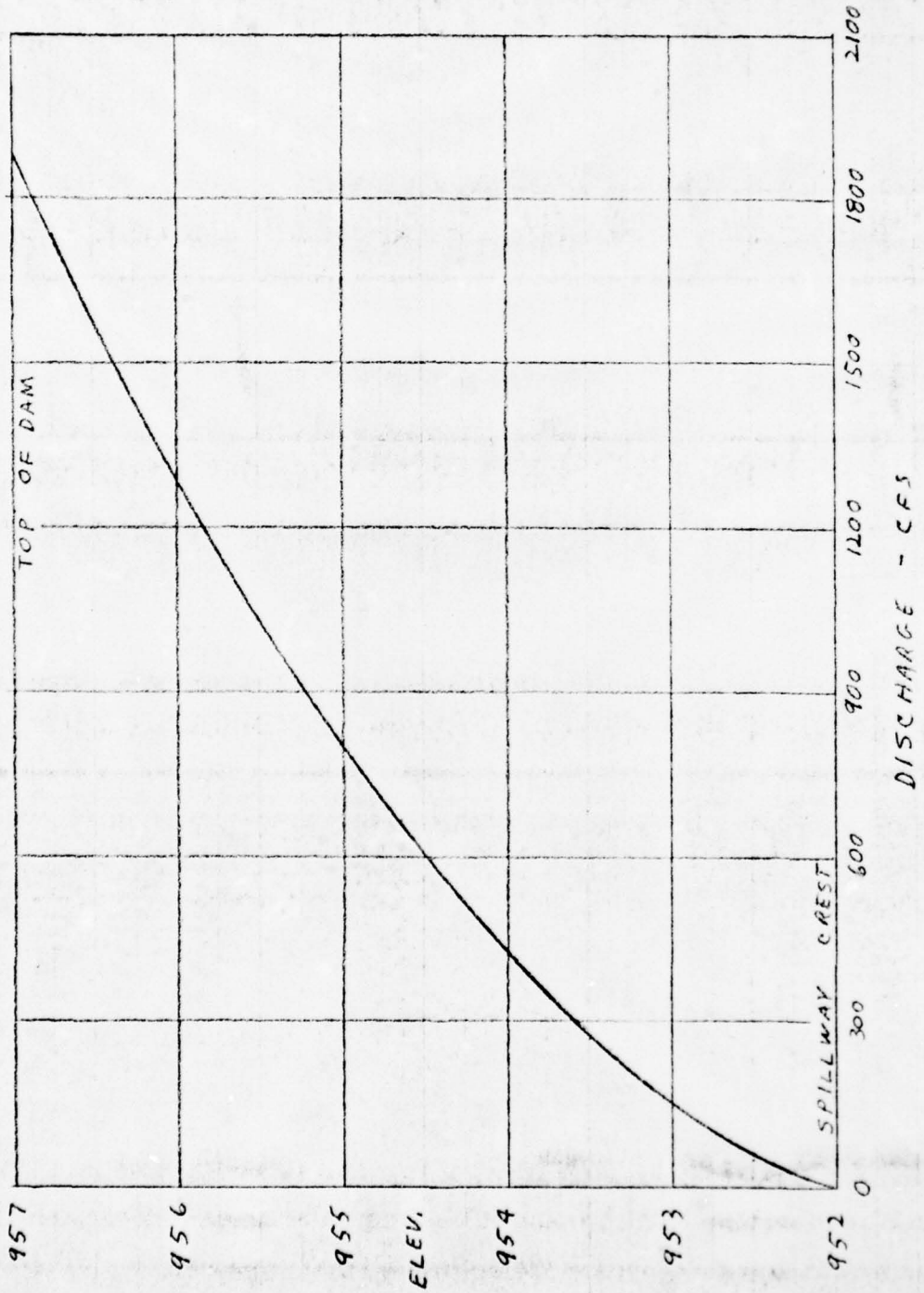
SAY 1870 CFS

BY _____ DATE _____ BERGER ASSOCIATES SHEET NO. 2

CHKD. BY _____ DATE _____ PROJECT D 8410

SUBJECT SADDLE LAKE

SPILLWAY RATING CURVE



BY ... DATE 4/11/79 BERGER ASSOCIATES SHEET NO. ...
CHKD. BY ... DATE ... PROJECT D849.0
SUBJECT SADDLE LAKE

DISCHARGE THROUGH OUTLET WORKS

18" DIA. BLOWOFF PIPE

INVERT = 935

$Q = C A \sqrt{2gH}$ $C = 0.6$

$A = \pi D^2/4 = 1.77$ S.F.

AT NORMAL POOL

$H = 952 - 935.75 = 16.25$

$Q = C A \sqrt{2gH}$
$= 0.6 \times 1.77 \times (2 \times 32.2 \times 16.25)^{.5}$

$= 34$ CFS

AT LOW POOL ELEV 940

$H = 940 - 935.75 = 4.25$

$Q = C A \sqrt{2gH}$
$= 0.6 \times 1.77 \times (2 \times 32.2 \times 4.25)^{.5}$

$= 18$ CFS

BY ... DATE ... BERGER ASSOCIATES

CHKD. BY ... DATE ... PROJECT D-84

SUBJECT SADDLE LAKE

MAXIMUM KNOWN FLOOD AT DAM SITE

IT WAS REPORTED THAT THE MAXIMUM KNOWN CAUSED THE WATER LEVEL IN THE LAKE TO RISE TO AN ELEVATION 2 INCHES HIGHER THAN THE SPILLWAY CREST.

$H = {}^{2}/_{12} = .17'$

$$L = \frac{44 + 44 + (2 \times {}^{2}/_{12} \times 2)}{2} = 44.33$$

$Q = C L H^{3/2}$

$= 3.1 \times 44.33 \times (.17)^{1.5}$

$= 9.6$ SAY 10 CFS

CHKD. BY _____ DATE _____ PROJECT D84...

SUBJECT SADDLE LAKE

SIZE CLASSIFICATION

MAXIMUM STORAGE = 357 ACRE-FEET

MAXIMUM HEIGHT = 24 FEET

SIZE CLASSIFICATION IS SMALL

HAZARD CLASSIFICATION

SEVERAL HOMES LOCATED ALONG THE DOWNSTREAM CHANNEL.

USE "HIGH"

RECOMMENDED SPILLWAY DESIGN FLOOD

THE ABOVE CLASSIFICATIONS INDICATE USE OF AN SDF EQUAL TO ONE-HALF PMF TO THE PMF.

BY _____ DATE _____ BERGER ASSOCIATES SHEET NO. 6
CHKD. BY _____ DATE _____ PROJECT D8440
SUBJECT SADDLE LAKE

HEC-1 DATA

DRAINAGE AREA = 0.4 SQ. MI.

SUSQUEHANNA BASIN REGION II

$C_P = 0.62$

$C_T = 1.5$

L' END OF RESERVOIR TO BASIN DIVIDE = 0.133 MI.

$T_P = C_T (L')^{.6}$

$T_P = 0.45$

RAINFALL (HMR-40)

INDEX = 21.4 IN.

INCREMENTAL RAINFALL

6 HR = 117.5 %

12 HR = 127 %

24 HR = 136.5 %

48 HR = 142.5 %

72 HR = 145 %

STORAGE = 175 A-F AT SPILLWAY CREST (FROM STATE FILES)

PLANIMETERED AREAS (FROM QUAD SHEET)

ELEV: 952 = 29.4 ACRES

960 = 54 ACRES

ZERO STORAGE ELEVATION

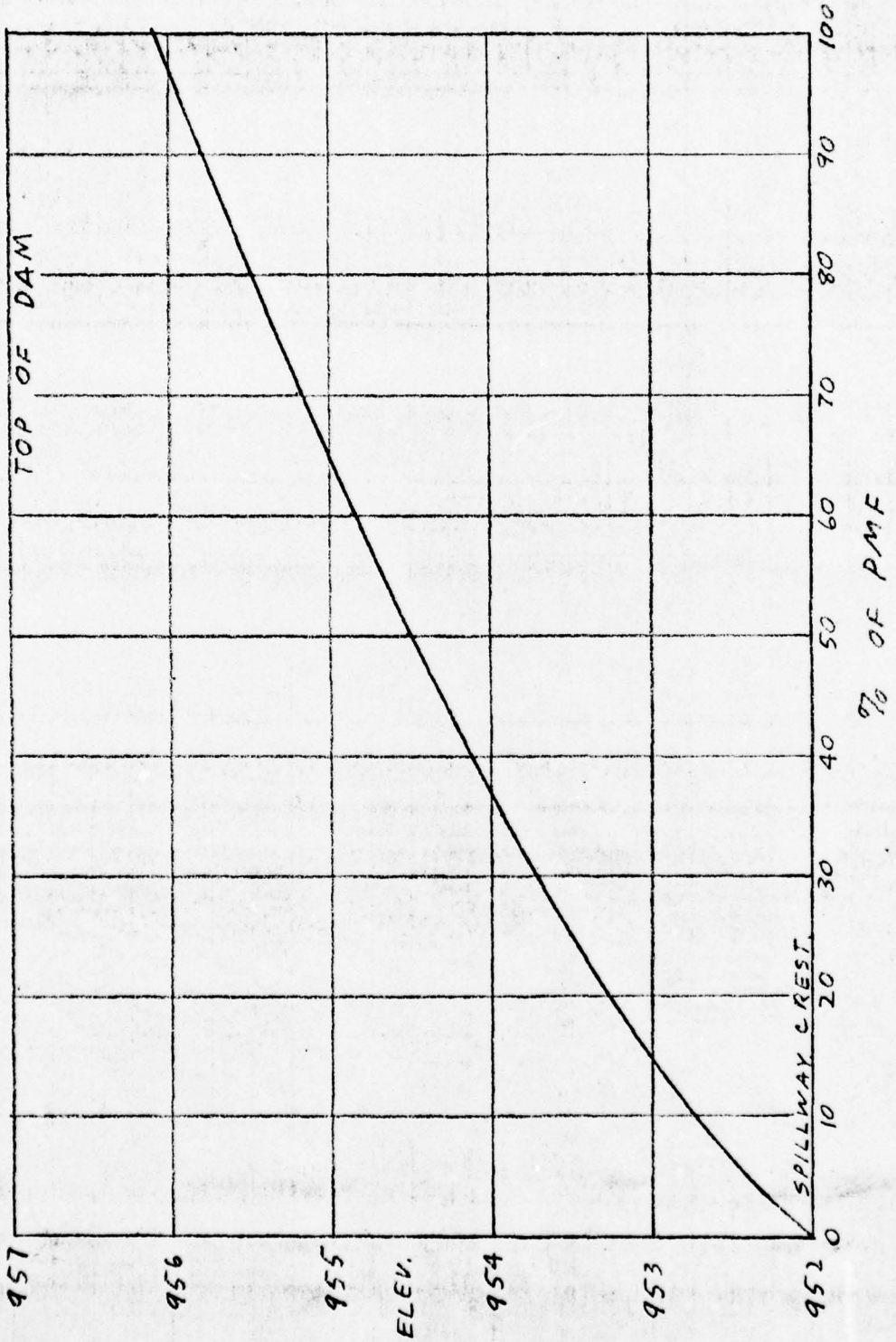
ELEV = 952 - (STORAGE X 3/AREA)

= 934.1

CHKD. BY_____ DATE_____ PROJECT 089

SUBJECT SADDLE LAKE

SPILLWAY CAPACITY CURVE



```
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION  26 FEB 79
**********************************
    1             A1      SADDLE LAKE DAM   ****   OSTERHOUT CREEK
    2             A2      TUNKHANNOCK TWP., WYOMING COUNTY, PA.
    3             A3      ND1 #  PA-00895     PA DER #  66-56
    4             B   300      0      15       0       0       0       0       0      -4       0
    5             B1    5
    6             J     1      9       1
    7             J1    1     .9      .8      .7      .6      .5     .35     .25     .15
    8             K             1                                      1
    9             K1                 INFLOW  HYDROGRAPH
   10             M     1       1      .4                                              1
   11             P            21.4   117.5     127   136.5   142.5     145
   12             T                                                    1     .05
   13             W    .45     .62
   14             X   -1.5    -.05       2
   15             K     1       2                                      1
   16             K1                 RESERVOIR  ROUTING
   17             Y                             1
   18             Y1    1                                             175      -1
   19             Y4  952   952.5     953   953.5     954     955     956     957
   20             Y5    0      49     143     268     421     805    1290    1870
   21             $A    0    29.4      54
   22             $E 934.1     952     960
   23             $$  952
   24             $D  957
   25             K    99
1                          PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

                                RUNOFF HYDROGRAPH AT          1
                                ROUTE HYDROGRAPH TO           2
                                END OF NETWORK


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

 RUN  DATE# 79/07/19.
      TIME# 10.28.51.



                     SADDLE LAKE DAM   ****   OSTERHOUT CREEK
                     TUNKHANNOCK TWP., WYOMING COUNTY, PA.
                     ND1 #  PA-00895     PA DER #  66-56

                                        JOB SPECIFICATION
                  NQ     NHR    NMIN    IDAY     IHR    IMIN   METRC    IPLT    IPRT   NSTAN
                 300       0      15       0       0       0       0       0      -4       0
                                       JOPER     NWT   LROPT   TRACE
                                           5       0       0       0


                                  MULTI-PLAN ANALYSES TO BE PERFORMED
                                      NPLAN= 1 NRTIO= 9 LRTIO= 1
                RTIOS=   1.00     .90     .80     .70     .60     .50     .35     .25     .15
```

SADDLE LAKE DAM #### OSTERHOUT CREEK
TUNKHANNOCK TWP., WYOMING COUNTY, PA.
ND1 # PA-00895 PA DER # 66-56

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
300	0	15	0	0	0	0	0	-4	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 9 LRTIO= 1
RTIOS= 1.00 .90 .80 .70 .60 .50 .35 .25 .15

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

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

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

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.40	0.00	.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.40	117.50	127.00	136.50	142.50	145.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA
TP= .45 CP= .62 NTA= 0

RECESSION DATA
STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 9 END-OF-PERIOD ORDINATES, LAG= .45 HOURS, CP= .62 VOL= 1.00
122. 326. 307. 151. 69. 32. 14. 7. 3.

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	24.82	22.27	2.56	24099.
										(631.)(	566.)(	65.)(	682.41)

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

HYDROGRAPH ROUTING

HYDROGRAPH ROUTING

RESERVOIR ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	175.	-1

STAGE	952.00	952.50	953.00	953.50	954.00	955.00	956.00	957.00
FLOW	0.00	49.00	143.00	268.00	421.00	805.00	1290.00	1870.00
SURFACE AREA=	0.	29.	54.					
CAPACITY=	0.	175.	504.					
ELEVATION=	934.	952.	960.					

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
952.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
957.0	0.0	0.0	0.

PEAK OUTFLOW IS 1344. AT TIME 40.50 HOURS

PEAK OUTFLOW IS 1196. AT TIME 40.50 HOURS

PEAK OUTFLOW IS 1051. AT TIME 40.50 HOURS

PEAK OUTFLOW IS 901. AT TIME 40.50 HOURS

PEAK OUTFLOW IS 752. AT TIME 40.50 HOURS

PEAK OUTFLOW IS 616. AT TIME 40.75 HOURS

PEAK OUTFLOW IS 403. AT TIME 40.75 HOURS

PEAK OUTFLOW IS 270. AT TIME 40.75 HOURS

PEAK OUTFLOW IS 144. AT TIME 40.75 HOURS

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

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS								
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9
				1.00	.90	.80	.70	.60	.50	.35	.25	.15
HYDROGRAPH AT	1	.40	1	2189.	1970.	1751.	1532.	1313.	1094.	766.	547.	328.
	(	1.04)	(	61.98)(	55.78)(	49.59)(	43.39)(	37.19)(	30.99)(	21.69)(	15.50)(	9.30)
ROUTED TO	2	.40	1	1344.	1196.	1051.	901.	752.	616.	403.	270.	144.
	(	1.04)	(	38.05)(	33.87)(	29.77)(	25.52)(	21.29)(	17.43)(	11.42)(	7.64)(	4.07)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	951.96	952.00	957.00
STORAGE	174.	175.	357.
OUTFLOW	0.	0.	1870.

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
1.00	956.09	0.00	319.	1344.	0.00	40.50	0.00
.90	955.81	0.00	307.	1196.	0.00	40.50	0.00
.80	955.51	0.00	295.	1051.	0.00	40.50	0.00
.70	955.20	0.00	283.	901.	0.00	40.50	0.00
.60	954.86	0.00	271.	752.	0.00	40.50	0.00
.50	954.51	0.00	258.	616.	0.00	40.75	0.00
.35	953.94	0.00	238.	403.	0.00	40.75	0.00
.25	953.51	0.00	223.	270.	0.00	40.75	0.00
.15	953.00	0.00	206.	144.	0.00	40.75	0.00

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

APPENDIX D

GEOLOGIC REPORT

GEOLOGIC REPORT

Bedrock - Dam and Reservoir

Formation Name: Catskill Formation.

Lithology: The Catskill Formation consists of gray to red brown sandstones interbedded with red and gray siltstones with some minor shale beds.

Structure

The dam is located in an area of essentially horizontal bedding. No details of local geology are available. Fracture traces in the area strike N5°E and N70°E.

Overburden

The only exploration was in the form of test pits dug by backhoe. Bedrock was found at 3.5 to 6 feet below land surface. Soil was noted to be one to two feet thick.

Aquifer Characteristics

The rocks of the Catskill Formation are generally impermeable and ground water movement is on bedding planes and fractures. Where fracturing is intense, considerable movement is possible.

Discussion

The plans for this dam called for a cutoff trench to be dug into rock under the main embankment. The dike on the west side was to have a V-shaped groove cut to bedrock. There was no inspection of the foundation during construction. There is the possibility of leakage through the rock below the cutoff trench, along the strong N5°E fracture system. Leakage is not likely to cause deterioration of the bedrock.

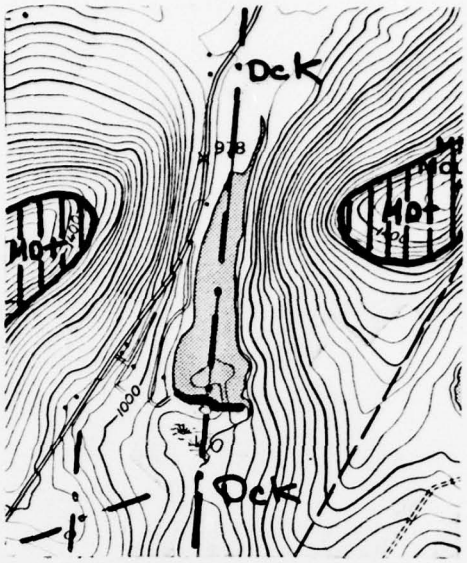
Sources of Information

1. Geologic Map of the Factoryville Quadrangle, on open file, Pa. Geol. Survey, Harrisburg, Pa.

2. Air Photographs, scale 1:24,000. Dated 1969.

3. Plans and correspondence in file.

GEOLOGIC MAP - Saddle Lake Dam



(geology from Pa. Geol. Surv. open file)

Mot — Catskill - Pocono transition

DcK — Catskill Fm.- undifferentiated

— . — . air photo fracture trace

SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

APPENDIX E

PHOTOGRAPHS



Top of Dam
and
Upstream Slope

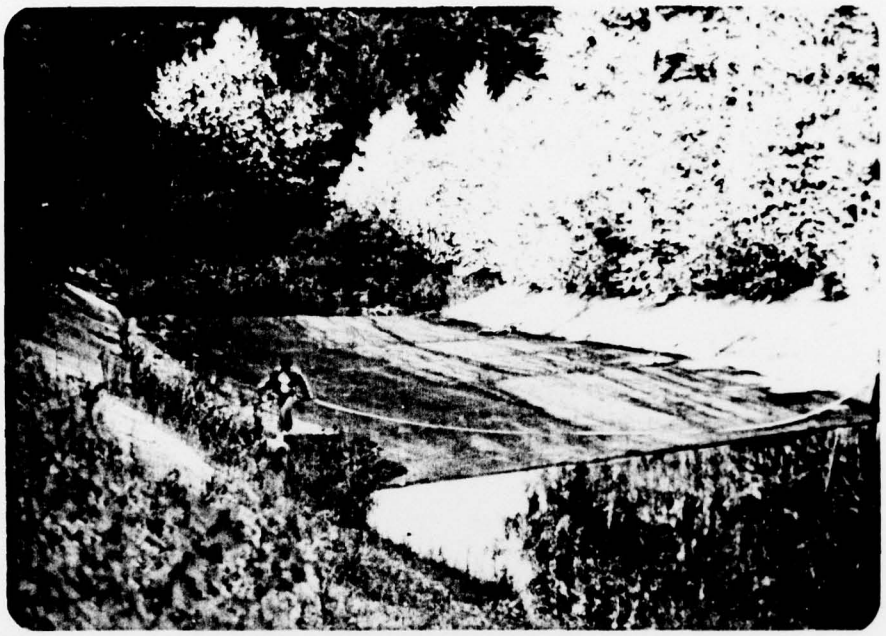


Downstream Slope
with Brush



Spillway Entrance
Channel

PA-895
PLATE E-I



Spillway & Overgrown Discharge Channel

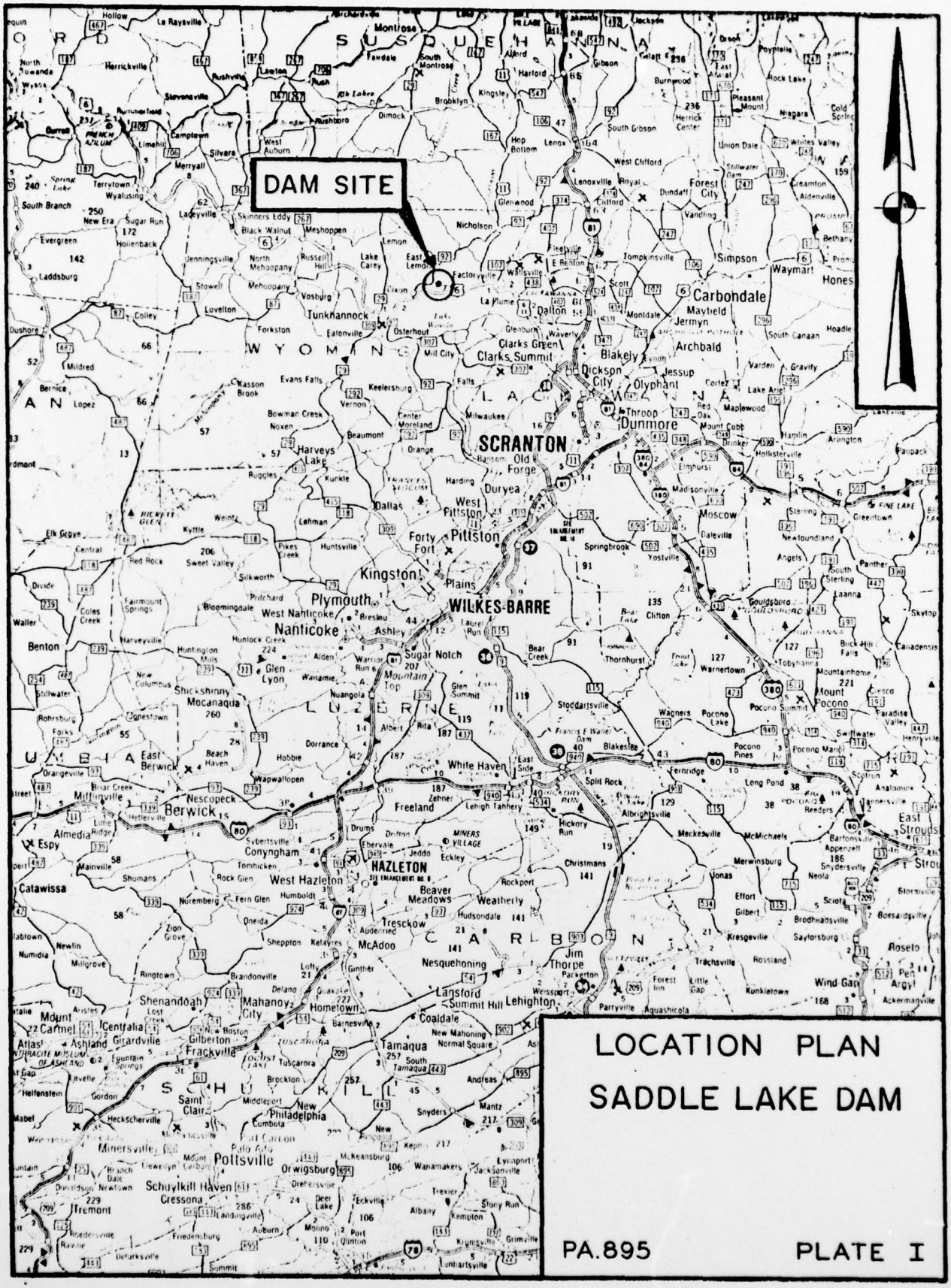


Reservoir

PA-895
PLATE E-II

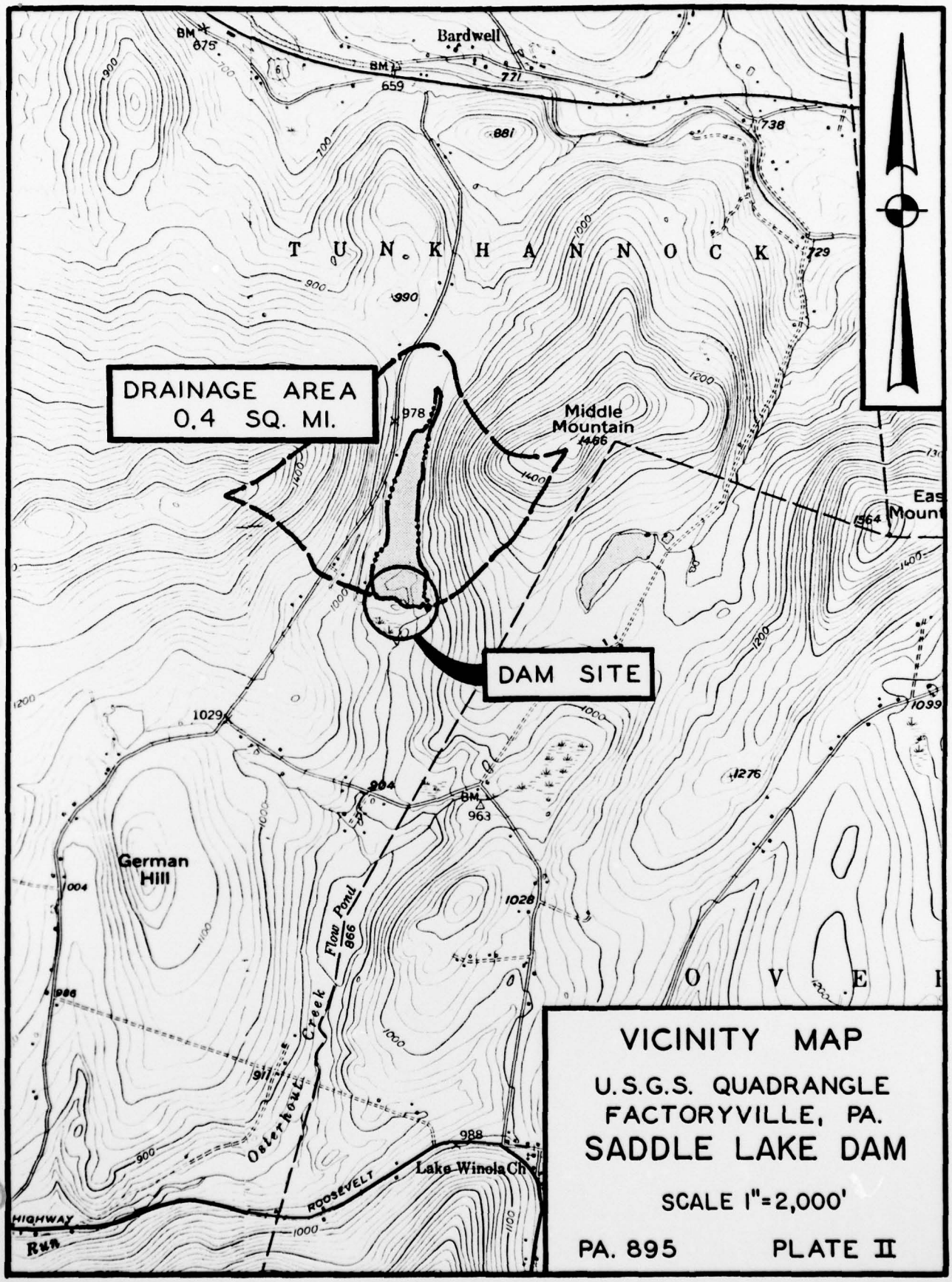
APPENDIX F

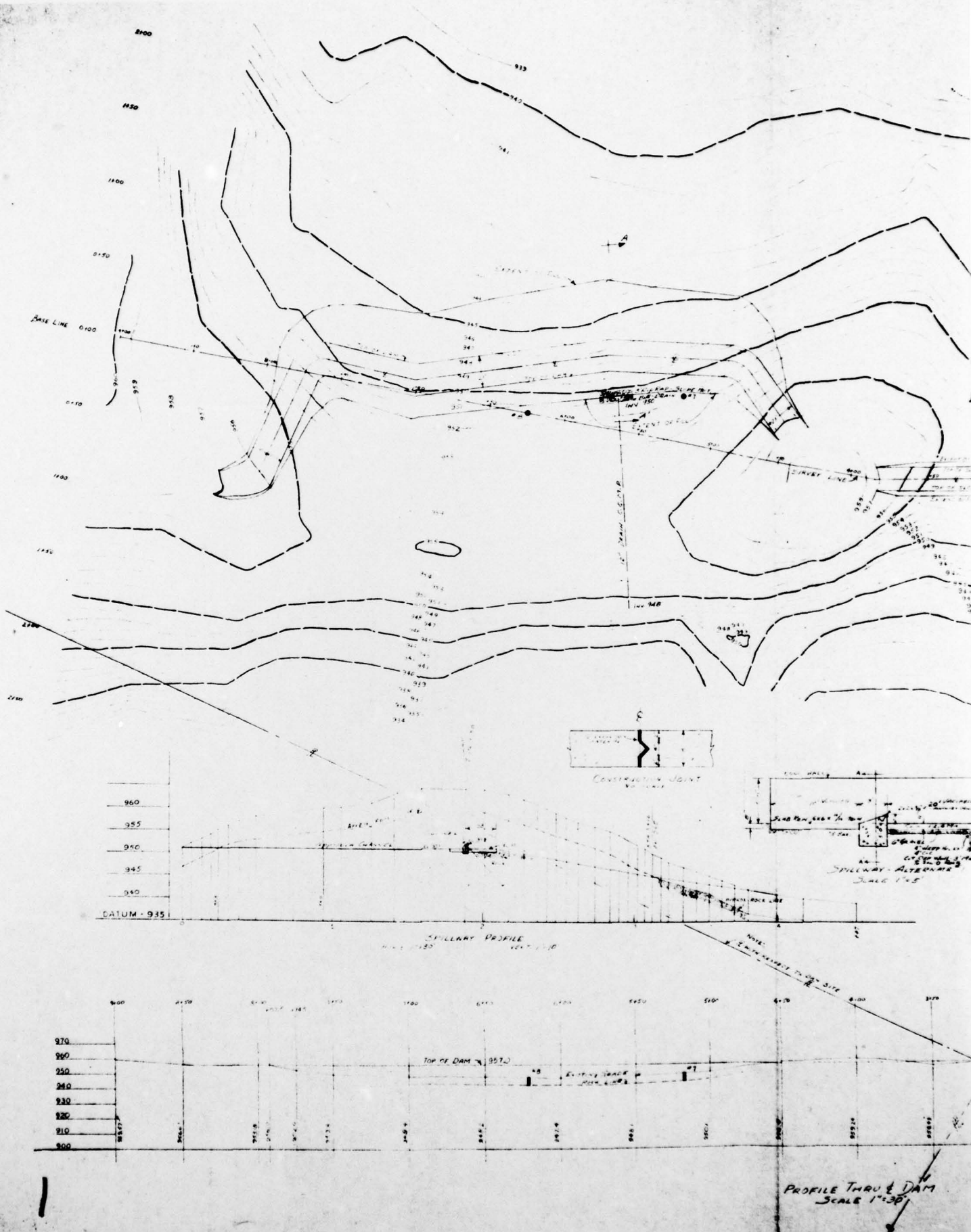
PLATES

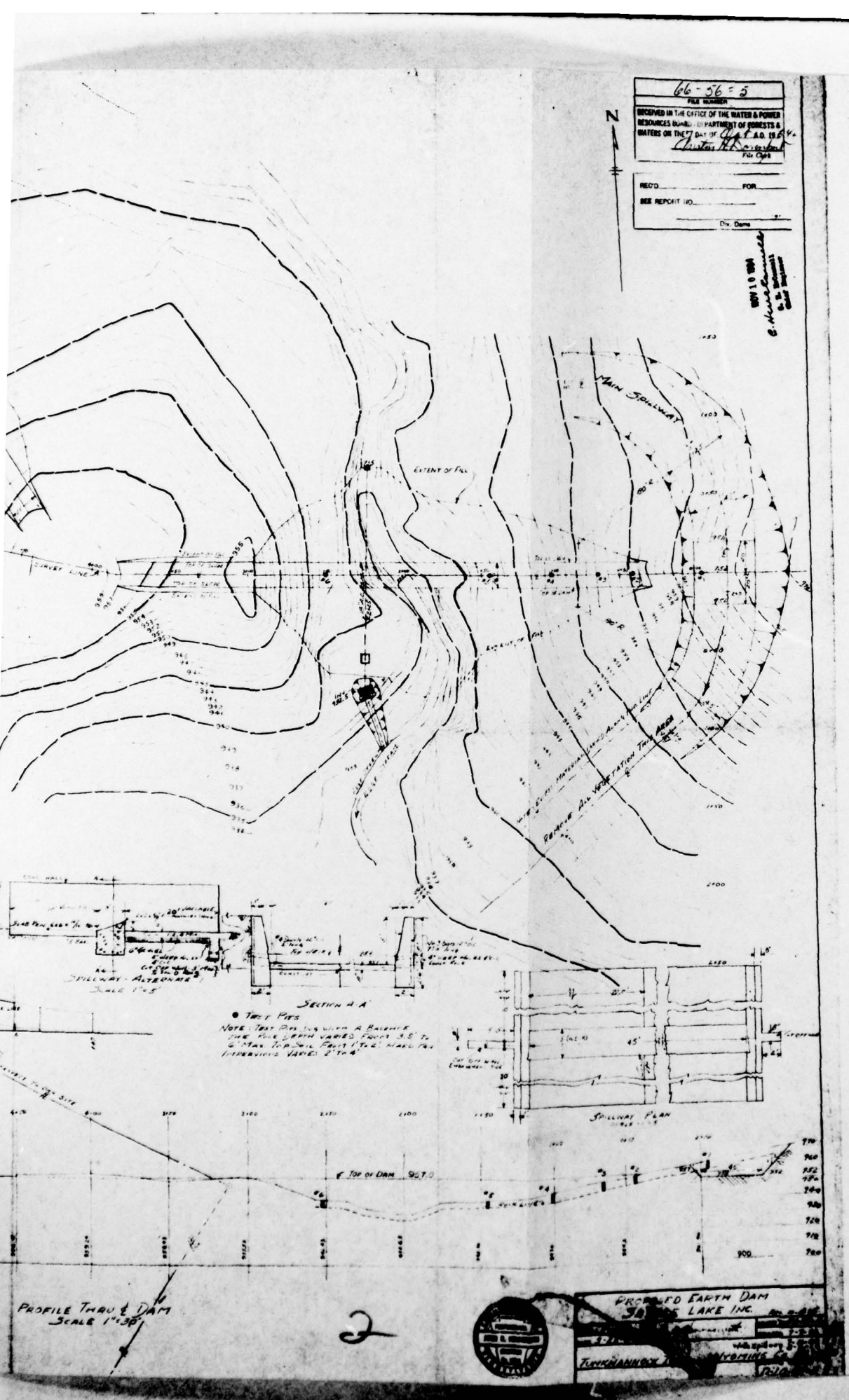


LOCATION PLAN
SADDLE LAKE DAM

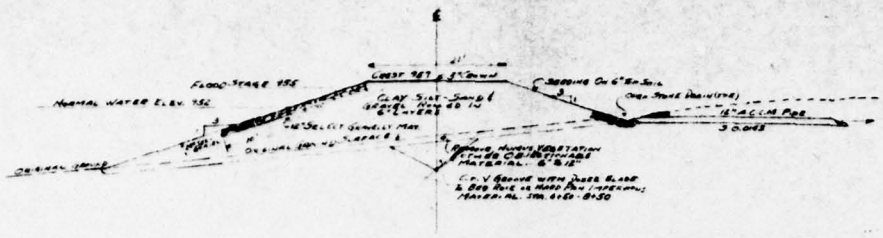
PA.895 PLATE I


Bardwell
BM 875
BM 659
771
738
881
729
T U N K H A N N O C K
990
DRAINAGE AREA
0.4 SQ. MI.
978
Middle Mountain
1486
1564
DAM SITE
1029
1099
1276
904
BM 963
German Hill
1004
1028
Flow Pond
866
Osterhout Creek
911
988
Lake Winola Ch
ROOSEVELT HIGHWAY
Run
O V E
VICINITY MAP
U.S.G.S. QUADRANGLE
FACTORYVILLE, PA.
SADDLE LAKE DAM
SCALE 1"=2,000'
PA. 895 PLATE II

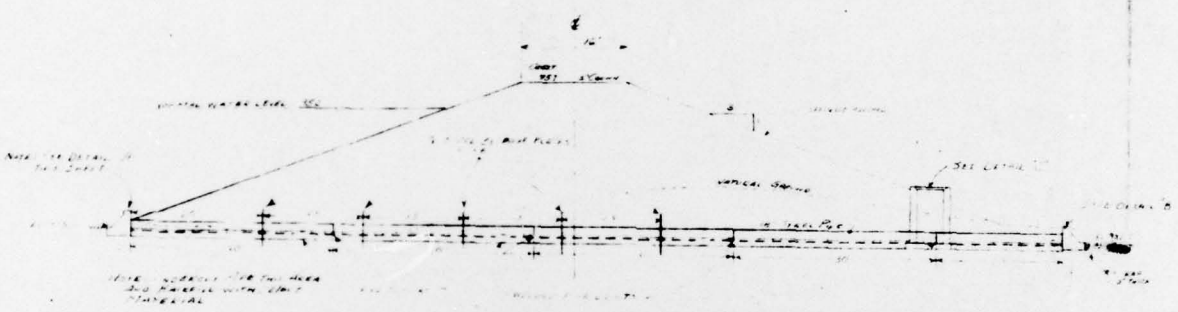

BASE LINE
SURVEY LINE A
DATUM - 935
SPILLWAY PROFILE
SPILLWAY - ALTERNATE
SCALE 1"=5'
CONSTRUCTION JOINT
TOP OF DAM - 957.0
PROFILE THRU ℄ DAM
SCALE 1"=30'



PA.-895
PLATE III



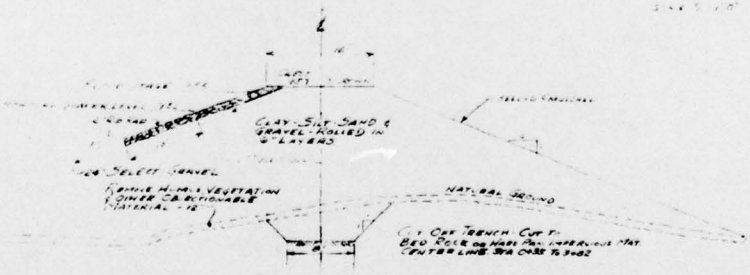
DIKE SECTION STA. 4+50 TO 8+50
SCALE 1"=10'



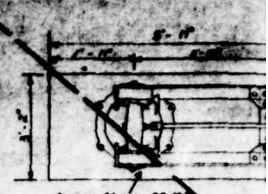
STATION 8+50 DIKE SECTION
SCALE 1"=10'

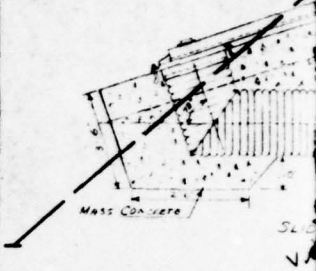


PIPE SUPPORTS
SCALE 1"=10'



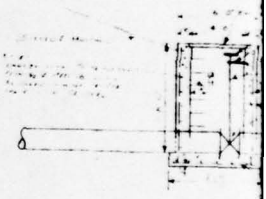
MAXIMUM DIKE SECTION
SCALE: 1"=10'



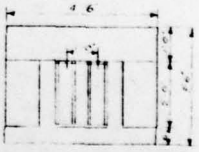


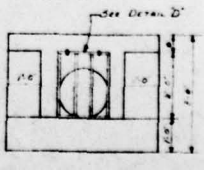
BILL OF

SLIDE GATE ARM	
STEM - COLD	
STEM SPLICE	
STEM GUIDE WITH ANCHOR	
HANDWHEEL LIFT	



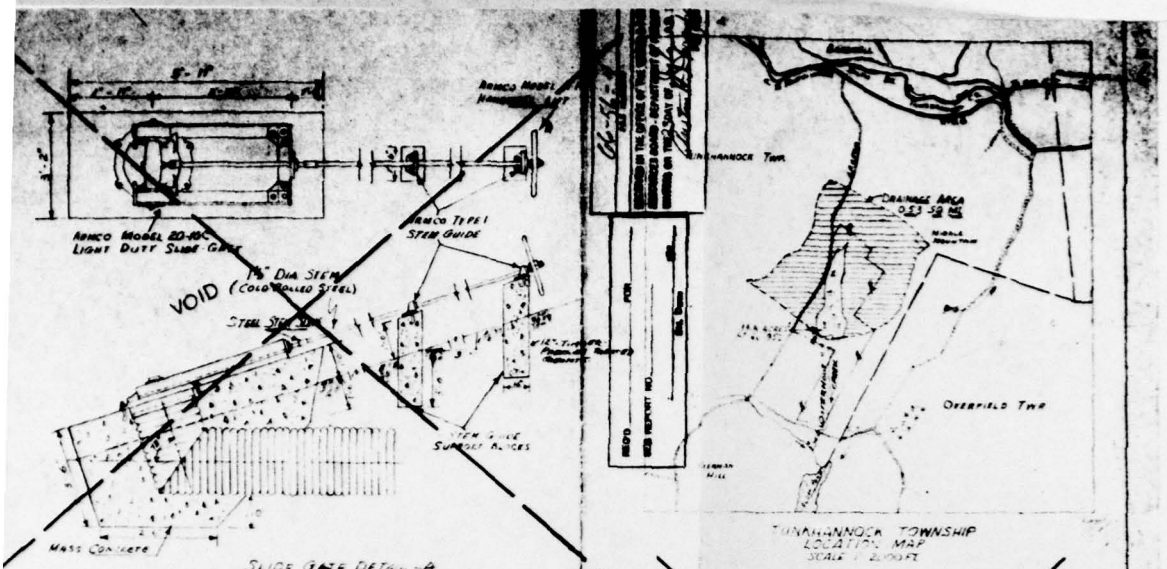
DETAIL





DETAIL

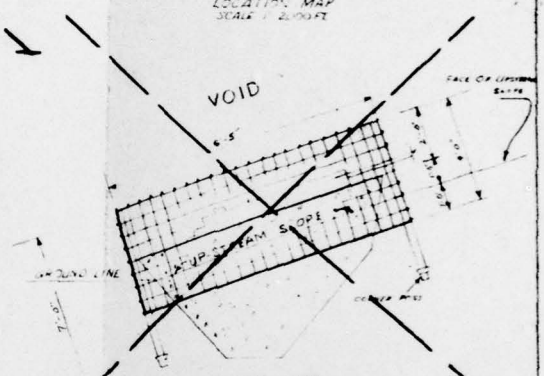
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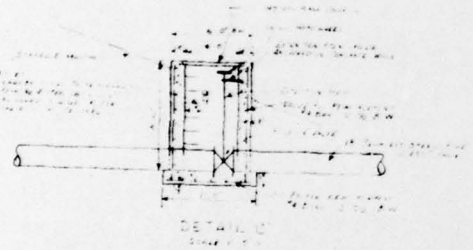


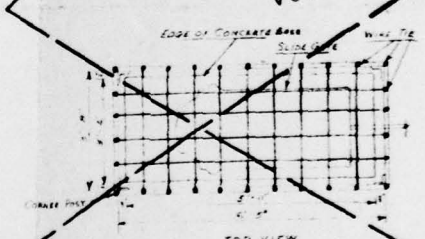
VOID

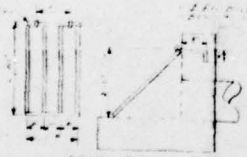
BILL OF MATERIALS

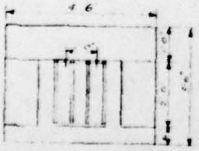
ITEM	SIZE	LENGTH	QUANTITY
SLIDE GATE ARMCO MODEL 20-RC (SPLICE TYPE) WITH ANCHOR BOLTS	8"		
STEM - COLD ROLLED STEEL	1"		1
STEM SPLICE (STEEL)			
STEM GUIDE ARMCO TYPE I WITH ANCHOR BOLTS			4
HANDWHEEL LIFT ARMCO MODEL H-8	18"		1



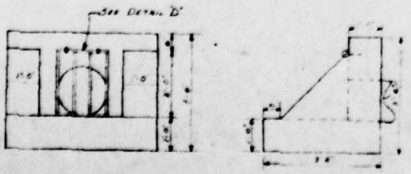


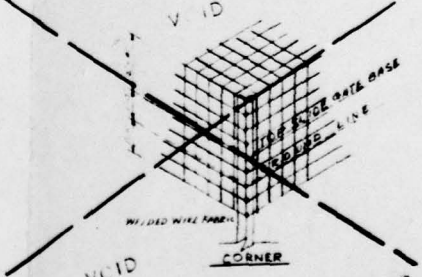






NOTE: DETAIL "B" SIMILAR TO DETAIL "A" NO TRASH RACK





SLIDE GATE TRASH GUARD

BILL OF MATERIALS

ITEM	SIZE	LENGTH	QUANTITY
CORNER POST		7'	4
WELDED WIRE FABRIC ASTM GUAGE 9½ (SPACING 6"x6")	6"x6"	4'-6"	2
WELDED WIRE FABRIC ASTM GUAGE 9½ (SPACING 6"x6")	6"x6"	5'-6"	2
WELDED WIRE FABRIC ASTM GUAGE 9½ (WIRE SPACING)	6"x6"	5'-6"	1

VOID

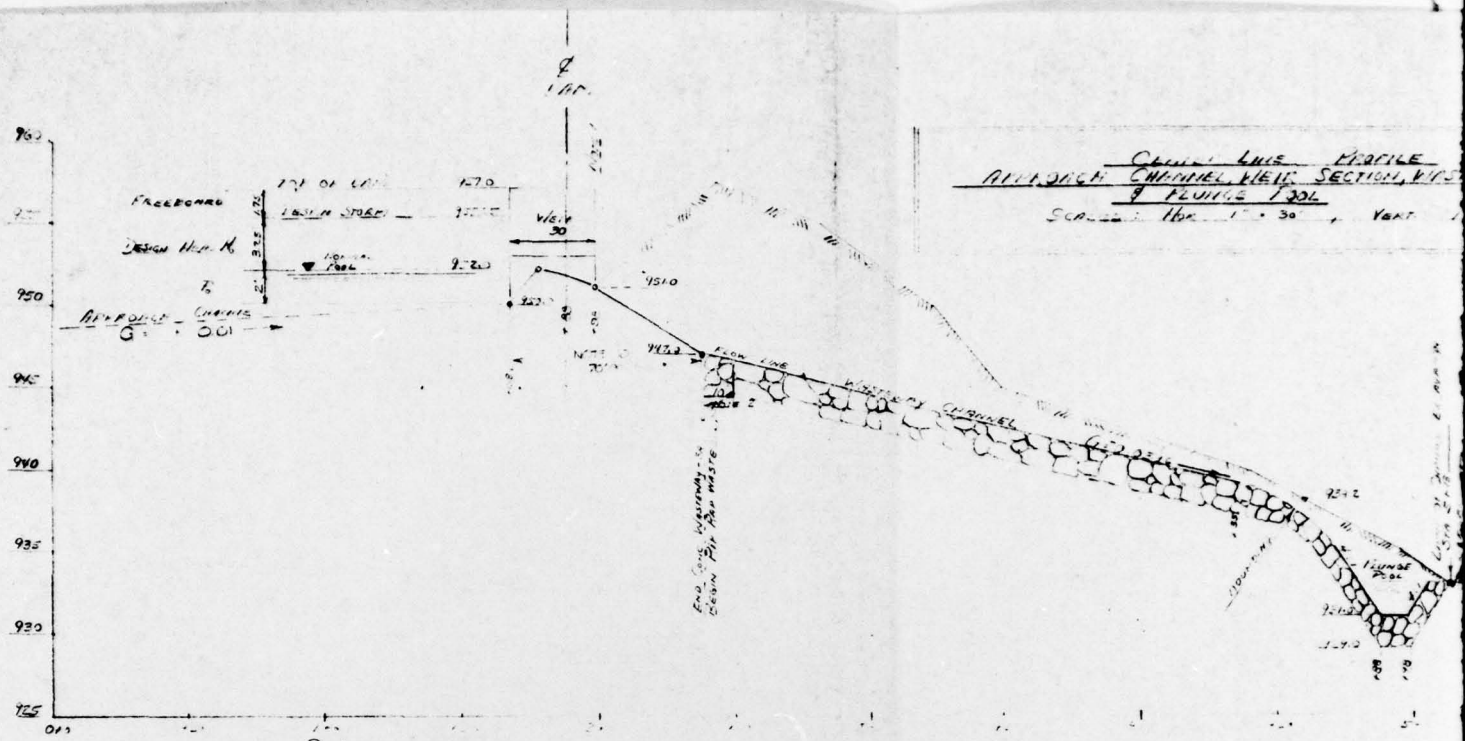
2

PROPOSED EARTH DAM
SADDLE LAKE INC.

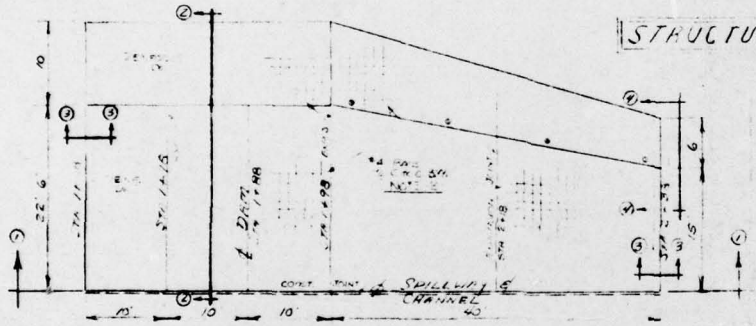
TUNKHANNOCK TWP. WYOMING CO.

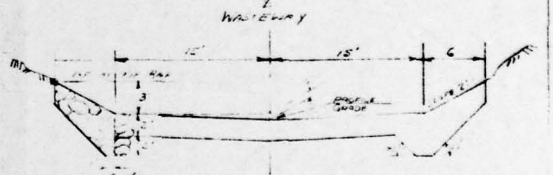
D-10-

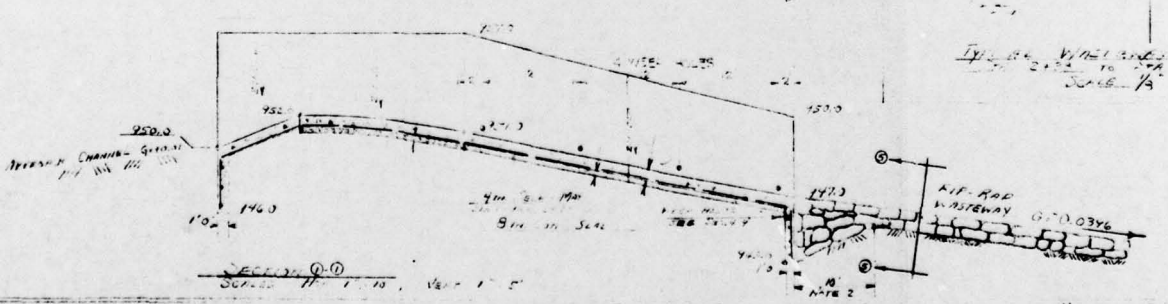
PA.-895
PLATE IV

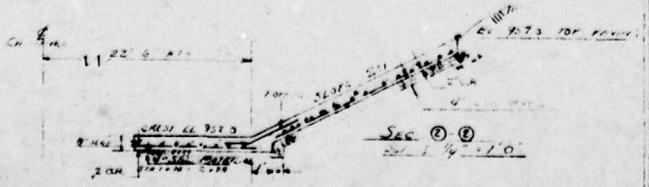


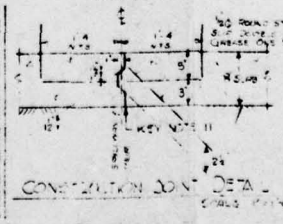
STRUCTURAL DETAILS

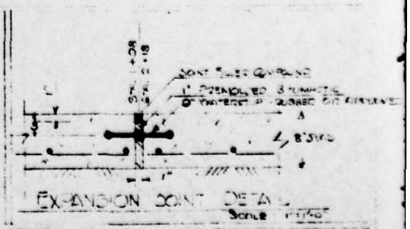


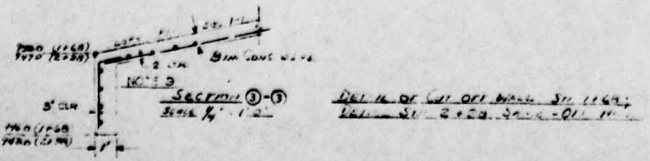


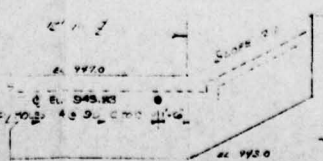


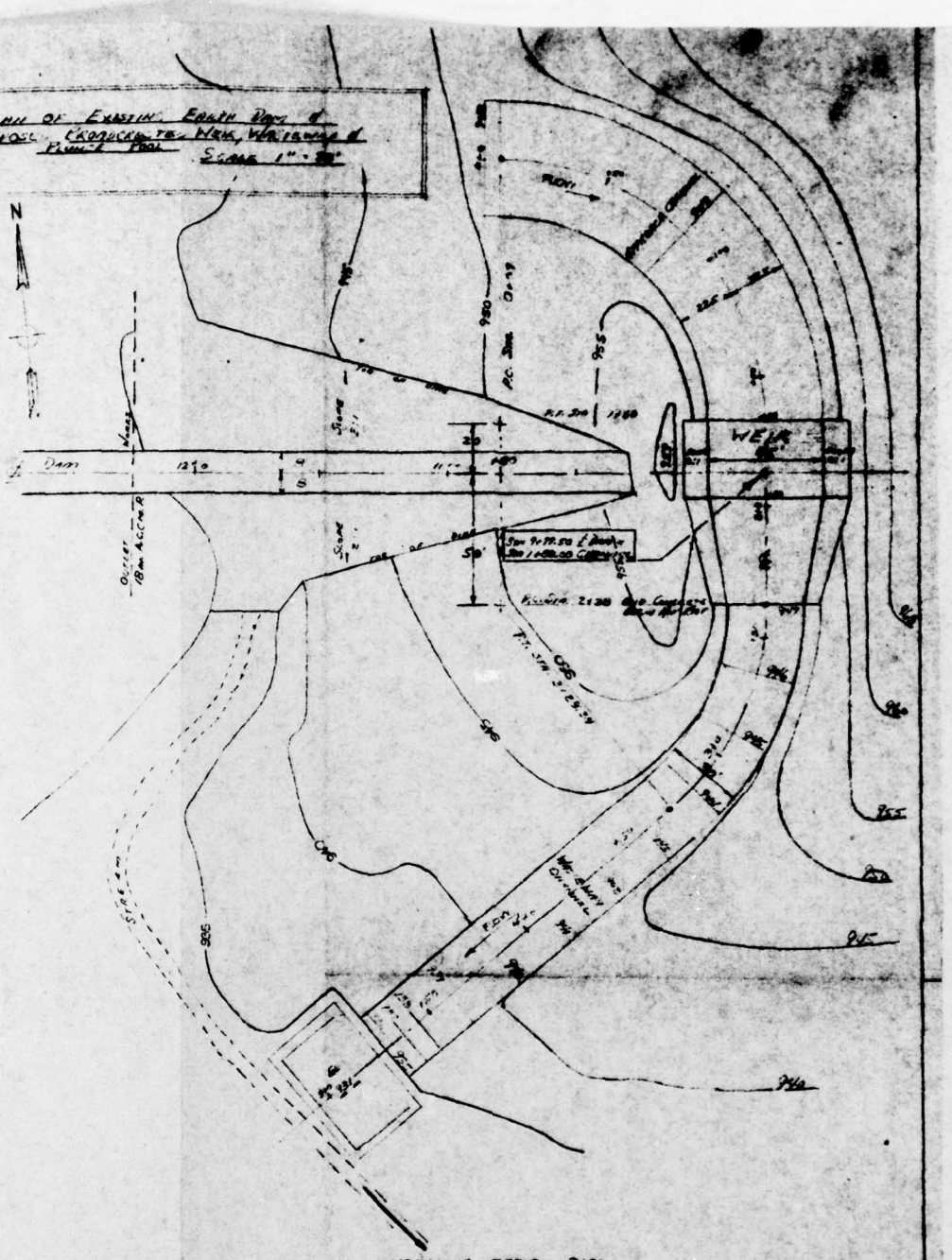












HYDRAULIC DESIGN DATA

1. Q = MAX. FLOOD 1490 C.F.S./SQ MI. 'C' CURVE PLATE I
   Q = 1490 × 0.53 = 791 C.F.S. DESIGN STORM SADDLE LAKE
2. SPILLWAY CAPACITY $Q = 2.8(45)\,3.25^{3/2} + 2.8(1)\,3.25^{5/2} = 885$ C.F.S.
3. VELOCITY IN APPROACH CHANNEL = 885/(3.25 × 45 + 3.25 × 6.86) = 5.6 F.P.S.
4. VELOCITY OVER SPILLWAY
   $V = 1.486/0.060 \times 0.316 \times 0.6306 = 32.7$ F.P.S.
   A = 27.12 Ft.
   Q IN SPILLWAY = 310 C.F.S.
   $R = 0.868^{2/3} = 0.836$
   $S = 0.100^{1/2} = 0.316$
5. VELOCITY IN ZIP DAM WASTEWAY
   $V = 1.486/0.028 \times 1.32 \times 0.199 = 18.60$ F.P.S.
   Q = 456 C.F.S.
   A = 24.8 FT.² R = 37.6 FT.
   $Q = 1.51 \times 2^{2/3} = 1.32$
   $S = 0.0896^{1/2}$ $S_f = 0.158$

APPROXIMATE PRESENT LIMIT OF FLOODING
ZIP DAM TO BE HANDPLACED & DUMPED RIP-RAP
RIP-RAP TO BE OBTAINED FROM CLASS I EXCAVATION
OVERFLOW SPILLWAY IN ABUTMENT TO PLACE RIP-RAP
ALL CONCRETE TO BE 3000 P.S.I. AT EARLY STRENGTH
ALL REINFORCING STEEL TO BE 20,000 P.S.I.
FIELD INFORMATION HAS BEEN FURNISHED BY OTHERS
ALL SLABS REINFORCED WITH #4 BARS @ 24 IN. C TO C BOTH WAYS
ALL BARS LAPPED 30 DIAMETERS
NO BACKFILL PERMITTED IN THIS AREA
KEY TO BE POURED OF #4 @ 6" & 8 GAUGE SHEET METAL
ALL JOINTS TO PROJECT 30 DIAMETERS WHERE FOUR S NOT VERTICAL TO C
PIPE TO BE 4 IN. DIAM. STEEL, INLET END FITTED WITH NON-CORROSIVE SCREEN, ¼ IN. OPNG. SLOPE 2%

DESIGN OF
BROADCRESTED WEIR & SPILLWAY
SADDLE LAKE DAM
TUNKHANNOCK TOWNSHIP, WYOMING COUNTY
PENNSYLVANIA
DATE: 1 MARCH 1965 BY: JOHN R. MANNEY
SCALE: 1 INCH = 50 FEET

PA.-895
PLATE V

2

For Lut on Dam #1 4-5-65