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NATIONAL DAM INSPECTION PROGRAM. SHARPE'S POND DAM (NDI I.D. PA--E
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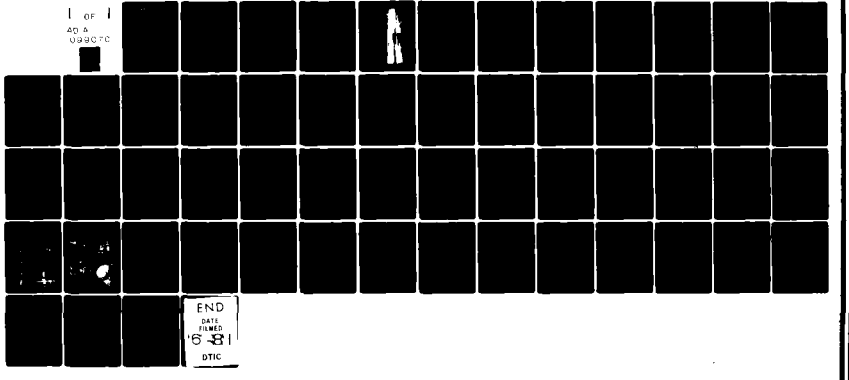


SUSQUEHANNA RIVER BASIN
LITTLE MEHOOPANY CREEK, WYOMING COUNTY

PENNSYLVANIA

(6) National Dam Inspection Program.

SHARPE'S POND DAM

(NDI I.D. PA-Ø888
DER I.D. Ø66-ØØ9)

~~OWNER: MR. CLAYTON SHARPE~~ Susquehanna River Basin, Little Mehoopany Creek, Wyoming County, Pennsylvania.

PHASE I INSPECTION REPORT.

NATIONAL DAM INSPECTION PROGRAM

(12) 57

PREPARED FOR

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
BALTIMORE, MARYLAND 21203

BY

(15) DACW 31-81-C-ØØ14

D'APPOLONIA CONSULTING ENGINEERS
10 DUFF ROAD
PITTSBURGH, PA. 15235

(11) 1981

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 Department of the Army, 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 visual observations and review of available data. Detailed investigations and analyses involving topographic mapping, subsurface investigations, material testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the inspection is intended to identify any need for such studies which should be performed by the owner.

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 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 the dam depends on numerous and constantly changing internal and external factors which are 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.

The assessment of the conditions and recommendations was made by the consulting engineer in accordance with generally and currently accepted engineering principles and practices.

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

NAME OF DAM: Sharpe's Pond Dam
STATE LOCATED: Pennsylvania
COUNTY LOCATED: Wyoming
STREAM: Little Mehoopany Creek, Tributary of Susquehanna River
SIZE CLASSIFICATION: Small
HAZARD CLASSIFICATION: High
OWNER: Mr. Clayton Sharpe
DATE OF INSPECTION: November 12, 1980 and February 4, 1981

ASSESSMENT: Based on the evaluation of the existing conditions, the condition of Sharpe's Pond Dam is considered to be fair. No conditions were noted that would significantly affect the structural stability of the dam.

The formal spillway facility, which consists of a three-foot-diameter drop inlet pipe, is considered to be vulnerable to blockage by debris during a flood and is, therefore, considered inadequate. Although a low area exists over the left abutment which may function as an emergency spillway, a need exists for the installation of a formal emergency spillway facility.

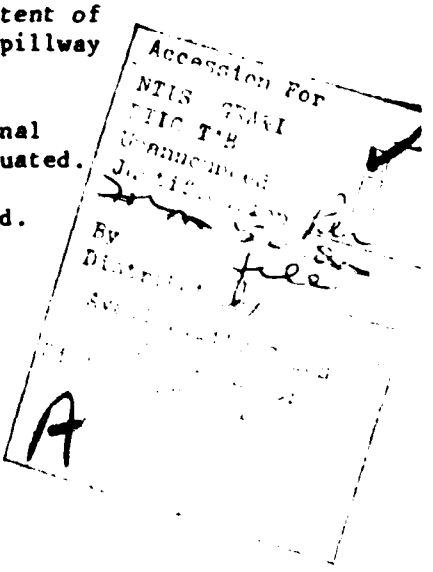
Flood discharge capacity of the dam, including the flow over the left abutment, was evaluated according to the recommended procedure and was found to be approximately 10 percent of the Probable Maximum Flood (PMF) without overtopping the low spot on the main embankment. This capacity is less than the recommended one-half of the PMF, according to the size and hazard classification for the dam. Although the spillway capacity is less than 50 percent of the PMF, overtopping of the dam is not considered to constitute a major breach potential. Therefore, the spillway is classified to be inadequate, but not seriously inadequate.

The following recommendations should be implemented immediately or on a continuing basis.

1. The owner should immediately retain a professional engineer experienced in the design and construction of dams to determine the nature and extent of improvements required to provide adequate spillway capacity.

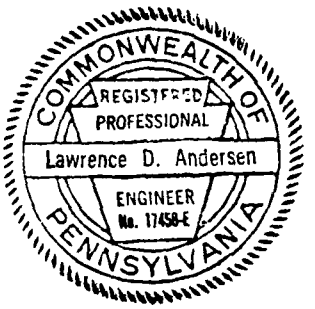
2. In conjunction with this work, the operational condition of the outlet pipe should be evaluated.

3. Brush and trees on the dam should be cleared.



4. Around-the-clock surveillance should be provided during unusually heavy runoff and a formal warning system developed to alert the downstream residents in the event of emergencies.

5. The owner should develop a formal operating and maintenance plan and inspect the dam regularly and perform necessary maintenance.



Lawrence D. Andersen, P.E.
Vice President

March 19, 1981
Date

Approved by:

JAMES W. PECK
Colonel, Corps of Engineers
District Engineer

22 APR 81
Date

SHARPE'S POND DAM
NDI I.D. PA-0888
DER I.D. 066-009
NOVEMBER 12, 1980

DOWNSTREAM VIEW

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(Continued)

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM
SHARPE'S POND DAM
NDI I.D. PA-0888
DER I.D. 066-009

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority. The inspection was performed pursuant to the authority granted by The National Dam Inspection Act, Public Law 92-367, to the Secretary of the Army, through the Corps of Engineers, to conduct inspections of dams throughout the United States.

b. Purpose. The purpose of this inspection is to determine if the dam constitutes a hazard to human life or property.

1.2 Description of Project

a. Dam and Appurtenances. Sharpe's Pond Dam consists of an earth embankment approximately 175 feet long with a maximum height of 16 feet above the downstream toe of the dam and a crest width of 12 feet. The upstream and downstream faces of the dam have slopes of approximately 3 to 1 (horizontal to vertical) and 2.5 to 1, respectively. Flood discharge facilities for the reservoir consist of a circular concrete drop inlet structure located near the left abutment which discharges into a two-foot-diameter concrete pipe through the embankment. An area near the left abutment was generally below the dam crest level and could function as an emergency spillway in the event of large flows into the reservoir. Water flowing over this region would travel through a shallow valley and back into the streambed about 500 feet downstream from the dam. The low level outlet facility appears to consist of a metal pipe, 10 or 12 inches in diameter, extending from the upstream toe into the drop inlet spillway structure and controlled by a valve inside the drop inlet structure. No other portion of the outlet works was visible.

b. Location. Sharpe's Pond Dam is located (N41° 35.2', W76° 11.2') on Little Mehoopany Creek, approximately two miles west of the town of Jenningsville in Windham Township, Wyoming County, Pennsylvania. Plate 1 illustrates the location of the dam.

c. Size Classification. Small (based on 16-foot height and 301 acre-feet maximum storage capacity).

d. Hazard Classification. The dam is classified to be in the high hazard category. Approximately 1,000 feet downstream from the dam, the

stream flows under two road embankments then discharges into Negro Pond (DER I.D. 066-010) about 1,000 feet further downstream. In this reach, two homes are located within the potential floodplain in the event of a dam failure. In particular, a home 500 feet from the dam is built very close to the streambed and is likely to receive significant damage. It is estimated that failure of the dam could cause loss of more than a few lives at the two downstream houses.

e. Ownership. Mr. Clayton Sharpe, R.D. #2, Laceyville, Pennsylvania 18623.

f. Purpose of Dam. Recreation.

g. Design and Construction History. No information is available on design and construction of the dam. The dam was first inspected by the Commonwealth of Pennsylvania in 1919.

h. Normal Operating Procedure. The reservoir is normally maintained at the crest level of the drop inlet spillway. The inflow occurring when the lake is at or above the spillway crest level is discharged through the drop inlet spillway.

1.3 Pertinent Data. Elevations referred to in this and subsequent sections of the report were calculated based on field measurements assuming the spillway crest to be at Elevation 1135 (USGS Datum) which is shown as the normal pool elevation on the USGS 7.5-minute Jenningsville quadrangle.

a. Drainage Area	0.99 square mile
b. Discharge at Dam Site (cfs)	
Maximum known flood at dam site	Unknown
Outlet conduit at maximum pool	Unknown
Gated spillway capacity at maximum pool	Not applicable
Ungated spillway capacity at maximum pool	36
Total spillway capacity at maximum pool	36
c. Elevation (USGS Datum) (feet)	
Top of dam	1136.7(1)
Maximum pool	1136.1(2)
Normal pool	1135.0
Upstream invert outlet works	1122± (estimated)
Downstream invert outlet works	1120.6
Maximum tailwater	Unknown
Toe of dam	1120.6±

(1) Left abutment embankment junction level.

(2) A low area on natural ground on the left abutment.

d. Reservoir Length (feet)

Normal pool level	3400
Maximum pool level	3466

e. Storage (acre-feet)

Normal pool level	250
Maximum pool level	301

f. Reservoir Surface (acres)

Normal pool level	45.0
Maximum pool level	47.4

g. Dam

Type	Earth embankment
Length	175 feet
Height	16 feet
Top width	12 feet
Side slopes	Downstream: 2.5H:1V; Upstream: 3H:1V
Zoning	Unknown
Impervious core	Unknown
Cutoff	Unknown
Grout curtain	Unknown

h. Regulating Outlet

Type	Appears to consist of a metal pipe approximately 10 or 12 inches in diameter, extending from the upstream toe of the dam into the drop inlet spillway structure and controlled by a valve inside the structure.
Length	90 feet±
Closure	Valve
Access	Drop inlet spillway structure
Regulating facilities	Valve

i. Spillway

Type	Circular concrete drop inlet structure
Length	9.4 feet (perimeter length of inlet)
Crest elevation	1135.0 feet
Upstream channel	Lake
Downstream channel	Earth channel

SECTION 2
DESIGN DATA

2.1 Design

a. Data Available. The available data consists of files provided by the Commonwealth of Pennsylvania, Department of Environmental Resources (PennDER) which contain correspondence and inspection reports.

(1) Hydrology and Hydraulics. No design information is available.

(2) Embankment. Available information consists of past inspection reports and correspondence.

(3) Appurtenant Structures. No design information is available.

b. Design Features

(1) Embankment. No information is available on the design of the dam. The 1919 state inspection report indicates that at that time, the dam was an eight-foot-high stone masonry structure. Presently, the dam is an earth embankment approximately 175 feet long with a maximum height of 16 feet above the downstream toe and a crest width of 12 feet. The upstream and downstream faces of the dam have slopes of approximately 3 to 1 (horizontal to vertical) and 2.5 to 1, respectively.

(2) Appurtenant Structures. The appurtenant structures consist of a primary spillway located near the left abutment and the outlet works. The spillway is comprised of a three-foot-diameter concrete drop inlet structure connected to a two-foot-diameter horizontal pipe which discharges into an earth channel at the toe of the dam.

Based on field observations, the low level outlet facilities for the dam consist of a metal pipe 10 or 12 inches in diameter, extending from the upstream toe into the drop inlet structure. No design information is available on the details of the construction of the outlet pipe through the embankment. Flow through the outlet pipe appears to be controlled by a valve inside the structure.

c. Design Data

(1) Hydrology and Hydraulics. No design data are available.

(2) Embankment. No engineering data are available on the design of the embankment.

(3) Appurtenant Structures. No design information is available on the appurtenant structures.

2.2 Construction. No information is available on construction of the dam. A 1919 state inspection report indicates that at that time, the dam was an eight-foot-high stone masonry structure. Apparently after 1919, the original dam was either replaced by the present earth embankment or earth fill was placed over the old dam to form the present embankment. A state permit issued to drain the dam in 1963 suggests that the postconstruction modification of the dam may have been undertaken at that time. It appears that the present outlet facilities were constructed in conjunction with the construction of the earth embankment.

2.3 Operation. It is reported that there are no formal operating records maintained for the dam.

2.4 Other Investigations. None.

2.5 Evaluation

a. Availability. The available information was provided by PennDER.

b. Adequacy

(1) Hydrology and Hydraulics. No information is available.

(2) Embankment. No design and construction information is available to assess the adequacy of the design of the embankment.

(3) Appurtenant Structures. No design information is available for the appurtenant structures.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General. The onsite inspection of Sharpe's Pond Dam consisted of:

1. Visual inspection of the embankment, abutments, and embankment toe.

2. Visual examination of the spillway and the visible portions of the outlet works.

3. Evaluation of the downstream area hazard potential.

The specific observations are illustrated in Plate 2.

b. Embankment. The general inspection of the embankment consisted of searching for indications of structural distress, such as cracks, subsidence, bulging, wet areas, seeps and boils, and observing general maintenance conditions, vegetative cover, erosion, and other surficial features.

In general, the condition of the dam is considered to be fair. The downstream face of the dam is covered with brush and trees and is irregular. However, no signs of distress were noted. The upstream face of the dam is covered with grass. No signs of significant shoreline erosion were noted. There is no erosion protection such as riprap along the upstream slope of the embankment.

The crest of the dam was surveyed relative to the drop inlet spillway crest elevation and it was found that the crest of the dam, from the spillway to the right abutment, is generally about two feet above the drop inlet crest level. From the spillway to the left abutment, the crest of the dam slopes down to a low area on natural ground about 100 to 200 feet from the drop inlet structure. This area can serve as an emergency spillway for release of excess flow. The crest of the embankment is illustrated in Plate 3.

c. Appurtenant Structures. The drop inlet spillway structure was examined for deterioration or other signs of distress that would limit flow. In general, the spillway, which consist of a concrete drop inlet structure which discharges into an outlet pipe, was found to be in fair condition. Due to the small size of the drop inlet structure, the spillway is considered to be vulnerable to blockage by debris during storms.

The visible portion of the outlet works consisted of the low level outlet pipe valve located in the drop inlet structure, an opening at the base of the drop inlet structure which appeared to be the upstream end of the spillway outlet pipe, and the downstream end of the outlet pipe. Operation of the low level outlet pipe valve was not observed.

d. Reservoir Area. A map review indicates that the watershed is predominantly covered by woodlands. A review of the regional geology is included in Appendix F.

e. Downstream Channel. Approximately 1,000 feet downstream from the dam, the stream flows under two road embankments. One thousand feet further downstream, the stream discharges into Negro Pond (DER I.D. 066-010) which impounds a reservoir with a surface area of 81 acres at normal pool level. Below Negro Pond are Chamberlain Pond (DER I.D. 066-011) which impounds a reservoir with a 49-acre surface area, the town of Jenningsville, and Jennings Pond (DER I.D. 066-012) with a surface area of 37 acres at normal pool. A further description of the downstream conditions is included in Section 1.2 d.

3.2 Evaluation. The condition of the dam is considered to be fair. The downstream face of the dam is covered with brush and small trees, requiring clearing. A small drop inlet type spillway is the only formal flood discharge facility for the dam. Due to its small size, this spillway is likely to be blocked by debris during floods. A low area exists over the left abutment which may serve as an emergency spillway. However, it is considered advisable that the owner should install a formal emergency spillway. The operational condition of the outlet pipe valve was not observed. Therefore, it is recommended that the outlet pipe valve should be operated and necessary maintenance performed.

SECTION 4
OPERATIONAL FEATURES

4.1 Procedure. There are no formal operating procedures for the dam. The reservoir is normally maintained at the uncontrolled primary spillway crest level, with excess inflow discharging through the drop inlet primary spillway.

4.2 Maintenance of the Dam. The maintenance of the dam is considered to be fair. The downstream embankment slope is covered with brush and small trees and does not appear to be regularly cleared.

4.3 Maintenance of Operating Facilities. The maintenance condition of the operating facilities could not be determined. Only the downstream end of the low level outlet pipe was visible.

4.4 Warning System. No formal warning system exists for the dam. Telephone communication facilities are available via several residences along the reservoir shoreline.

4.5 Evaluation. The maintenance condition of the dam is considered to be fair. It is recommended that the operational condition of the outlet pipe valve be evaluated and necessary maintenance performed. Brush and trees on the downstream face should be cleared.

SECTION 5
HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. Sharpe's Pond Dam has a watersned area of 0.99 square mile and impounds a reservoir with a surface area of 45.0 acres at normal pool level. The flood discharge facilities consist of a three-foot-diameter drop inlet structure connected to a two-foot-diameter pipe through the dam located near the left abutment. The capacity of the spillway was determined to be 35 cfs, based on the available 1.1-foot freeboard relative to the low spot on the left abutment.

b. Experience Data. As previously stated, Sharpe's Pond Dam is classified as a small dam in the high hazard category. Under the recommended criteria for evaluating emergency spillway discharge capacity, such impoundments are required to pass one-half to full PMF. In view of the height and storage capacity of the dam which correspond to the lower limit of the small size classification and because the dam was found to be marginally into the high hazard category, the lower limit of the spillway design flood range is considered to be applicable to the dam.

The PMF inflow hydrograph for the reservoir was determined utilizing the Dam Safety Version of the HEC-1 computer program developed by the Hydrologic Engineering Center of the U.S. Army, Corps of Engineers. Data used for the computer analysis are presented in Appendix D. The inflow hydrographs were found to have peak flows of 3014 and 1507 cfs for full and 50 percent of PMF, respectively. Computer input and summary of computer output are also included in Appendix D.

c. Visual Observations. Field observations indicated that the drop inlet spillway, due to its small size, is likely to be blocked by debris during storms. For the purpose of following calculations, a reduction in the capacity of the drop inlet spillway due to possible blockage was not considered.

d. Overtopping Potential. Various percentages of the PMF inflow hydrograph were routed through the reservoir and it was found that the spillway can pass approximately 10 percent of the PMF without overtopping the low spot on the embankment. For 50 percent of the PMF, the low spot on the embankment would be overtopped for a duration of approximately 12.8 hours with a maximum depth of about 1.5 feet.

e. Spillway Adequacy. Because the spillway cannot pass the recommended design flood of one-half of the PMF without overtopping the low spot on the embankment, the spillway is classified to be inadequate. Although the spillway capacity is less than 50 percent of the PMF,

overtopping of the embankment near the left abutment is not considered to present a significant breach potential because water overtopping the left abutment would generally flow away from the embankment-abutment junction reducing the potential for serious erosion. Therefore, the spillway capacity is not considered to be seriously inadequate.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

(1) Embankment. As discussed in Section 3, the field observations did not reveal any signs of distress that would significantly affect the stability of the dam at this time, and none were reported in the past.

(2) Appurtenant Structures. The structural performance of the visible sections of the spillway appears to be satisfactory. Because only the ends of the low level outlet and spillway discharge pipes were visible, no conclusions were reached as to the structural adequacy of these facilities.

b. Design and Construction Data

(1) Embankment. No design and construction data is available to assess the structural adequacy of the dam as it was designed and constructed. As previously noted, no signs of distress were noted at this time. Therefore, based on visual observations, the static stability of the dam is considered to be adequate.

(2) Appurtenant Structures. No design and construction data are available for the appurtenant structures.

c. Operating Records. The structural stability of the dam is not considered to be affected by the operational features.

d. Postconstruction Changes. None reported.

e. Seismic Stability. The dam is located in Seismic Zone 1, and based on visual observations, the static stability of the dam is considered to be adequate. Therefore, based on the recommended criteria for the evaluation of seismic stability of dams, the structure is presumed to present no hazard from earthquakes.

SECTION 7
ASSESSMENT AND RECOMMENDATIONS/PROPOSED REMEDIAL MEASURES

7.1 Dam Assessment

a. Assessment. The visual observations indicate that Sharpe's Pond Dam is in fair condition. No conditions were observed that would significantly affect the structural performance of the dam and none have been reported in the past. The downstream face is covered with brush and small trees which require removal. The upstream face lacks erosion protection.

A drop inlet structure, which is considered to be vulnerable to blockage by debris during floods, is the only formal spillway facility for the dam. A low area exists near the left abutment which may serve as an emergency spillway. The dam is equipped with a low level outlet facility, however, operational condition of the outlet pipe was not observed. It is, therefore, recommended that the owner retain the services of a professional engineer to determine the nature and extent of improvements required to provide a formal emergency spillway facility and evaluate the operational condition of the outlet facilities.

Spillway capacity, including the flow over the spillway area, was evaluated according to the recommended procedure and was found to be approximately 10 percent of the PMF without overtopping the low spot on the embankment. This capacity is less than the recommended spillway capacity of one-half of the PMF according to the size and hazard classification for this dam. Although the spillway capacity is less than 50 percent of the PMF, it is estimated that overtopping of the embankment would not lead to a breach failure. Therefore, the spillway is classified to be inadequate, but not seriously inadequate.

b. Adequacy of Information. The available information, in conjunction with the visual observations of the inspectors, is considered sufficient to make the following recommendations.

c. Urgency. The following recommendations should be implemented immediately or on a continuing basis.

d. Necessity for Additional Data. In view of the inadequate spillway capacity, the owner should immediately initiate additional studies to more accurately ascertain the spillway capacity and the extent of improvements required to provide adequate discharge capacity.

7.2 Recommendations/Remedial Measures

It is recommended that:

1. The owner should immediately retain a professional engineer experienced in the design and construction

of dams to determine the nature and extent of improvements required to provide adequate spillway capacity.

2. In conjunction with this work, the operational condition of the outlet pipe should be evaluated.

3. Brush and trees on the dam should be cleared.

4. Around-the-clock surveillance should be provided during unusually heavy runoff and a formal warning system developed to alert the downstream residents in the event of emergencies.

5. The owner should develop a formal operating and maintenance plan and inspect the dam regularly and perform necessary maintenance.

APPENDIX A

CHECKLIST
VISUAL INSPECTION
PHASE I

APPENDIX A

CHECKLIST
VISUAL INSPECTION
PHASE I

NAME OF DAM Sharpe's Pond COUNTY Wyoming STATE Pennsylvania ID# DER: 066-009 NDI: PA-0888

TYPE OF DAM Earth embankment HAZARD CATEGORY High

DATE(S) INSPECTION November 12, 1980 WEATHER Cloudy TEMPERATURE 30's

POOL ELEVATION AT TIME OF INSPECTION 1134.8 M.S.L. TAILWATER AT TIME OF INSPECTION 1120.6± M.S.L.

INSPECTION PERSONNEL:	REVIEW INSPECTION PERSONNEL: (February 4, 1981)
Douglas Cosler	Lawrence D. Andersen
Arthur Smith	James H. Poellot
Bilgin Erel	Bilgin Erel

Owner's Representative:

Clayton Sharpe (owner)

Bilgin Erel RECORDER

VISUAL INSPECTION
PHASE I
EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	None observed.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	See Plate 3 for dam crest profile.	
RIPRAP FAILURES	Upstream slope has no riprap.	

VISUAL INSPECTION
PHASE I
EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No problems observed.	
ANY NOTICEABLE SEEPAGE	None found.	
STAFF GAGE AND RECORDER	None	
DRAINS	None	

VISUAL INSPECTION
PHASE I
OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Two-foot in diameter, precast concrete pipe. Only the downstream end is visible. Appears to be in good condition.	
INTAKE STRUCTURE	Three-foot in diameter, circular concrete drop inlet structure.	
OUTLET STRUCTURE	None	
OUTLET CHANNEL	Natural streambed.	
EMERGENCY GATE	Low level outlet facility appears to consist of a metal outlet pipe, 10 or 12 inches in diameter, extending from the upstream toe of the dam into the drop inlet structure. Flow through this pipe is controlled by a valve located in the drop inlet structure. Operation of this valve was not observed.	The owner should evaluate the operational condition of the outlet pipe valve and perform repairs, if required.

VISUAL INSPECTION
PHASE I
UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Other than the drop inlet structure associated with the outlet facilities, the dam has no other formally constructed spillway structures.	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE AND PIERS	N/A	

VISUAL INSPECTION
PHASE I
GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	The dam has no gated spillway.	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

VISUAL INSPECTION
PHASE I
INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER	None	

VISUAL INSPECTION
PHASE I
RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	No problems observed.	
SEDIMENTATION	Unknown	
UPSTREAM RESERVOIRS	None	

VISUAL INSPECTION
PHASE I
DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	No problems observed.	
SLOPES	No problems observed.	
APPROXIMATE NUMBER OF HOMES AND POPULATION	Two homes (approximate population = 8). One house is located about 500 feet downstream from the dam and is considered to be located within the potential floodplain in the event of a dam failure.	

APPENDIX B

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
AND HYDROLOGIC AND HYDRAULIC
PHASE I

APPENDIX B

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Sharpe's Pond

ID# NDI: PA-0888
DER: 066-009

ITEM	REMARKS
AS-BUILT DRAWINGS	None available.
REGIONAL VICINITY MAP	See Plate 1.
CONSTRUCTION HISTORY	Not reported.
TYPICAL SECTIONS OF DAM	See Plate 2 (a sketch based on visual observations).
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	Not available.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
RAINFALL/RESERVOIR RECORDS	None reported.
DESIGN REPORTS	None available.
GEOLOGY REPORTS	No geology information available.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	No computations available.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None reported.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
POST CONSTRUCTION SURVEYS OF DAM	None available.
BORROW SOURCES	None reported.
MONITORING SYSTEMS	None
MODIFICATIONS	None reported.
HIGH POOL RECORDS	None available.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

ITEM	REMARKS
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None available.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None reported.
MAINTENANCE OPERATION RECORDS	No information available.
SPILLWAY PLAN SECTIONS DETAILS	Not available.
OPERATING EQUIPMENT PLANS AND DETAILS	None

CHECKLIST
ENGINEERING DATA
HYDROLOGIC AND HYDRAULIC

DRAINAGE AREA CHARACTERISTICS: 0.99 square mile (wooded)

ELEVATION, TOP OF NORMAL POOL AND STORAGE CAPACITY: 1135.0 (250 acre-feet)

ELEVATION, TOP OF FLOOD CONTROL POOL AND STORAGE CAPACITY: 1136.1 (301 acre-feet)

ELEVATION, MAXIMUM DESIGN POOL: 1136.1 (design pool elevation unknown)

ELEVATION, TOP OF DAM: 1136.1 (low spot of left spillover)

SPILLWAY:

a. Elevation 1135.0

b. Type Circular concrete drop inlet structure

c. Width Three-foot diameter

d. Length N/A

e. Location Spillover Along left shoreline (next to left abutment)

f. Number and Type of Gates None

OUTLET WORKS:

a. Type Appears to be a 10 or 12-inch pipe connected to the drop inlet structure

b. Location Upstream toe of dam

c. Entrance Inverts 1122± (estimated)

d. Exit Inverts 1120.6

e. Emergency Drawdown Facilities 10 to 12-inch blow-off pipe (estimated)

HYDROMETEOROLOGICAL GAGES:

a. Type No gages

b. Location N/A

c. Records None

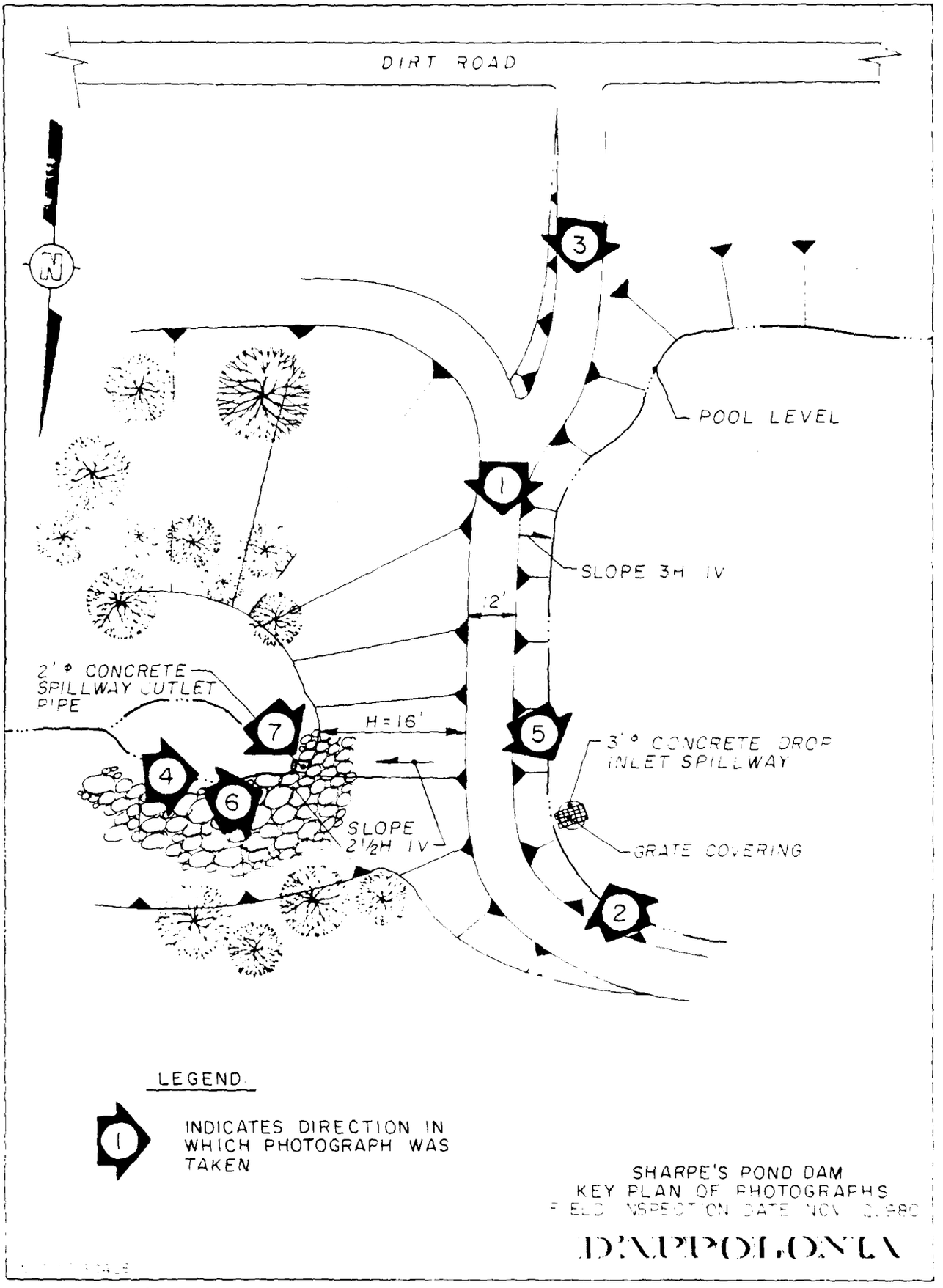
MAXIMUM NONDAMAGING DISCHARGE: Spillway capacity (36 cfs)

APPENDIX C

PHOTOGRAPHS

LIST OF PHOTOGRAPHS
SHARPE'S POND DAM
NDI I.D. NO. PA-0888
NOVEMBER 12, 1980

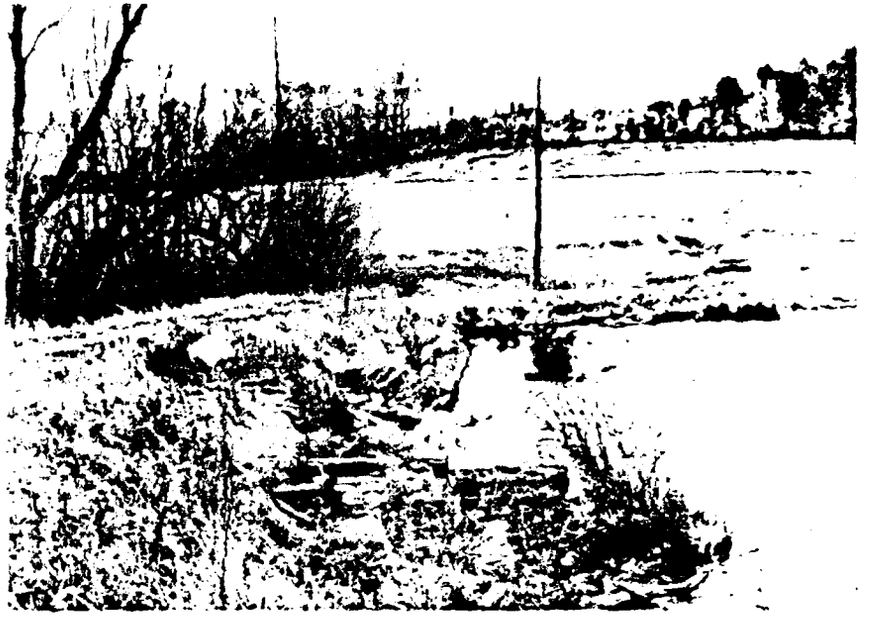
PHOTOGRAPH NO.	DESCRIPTION
1	Crest (looking north).
2	Crest (looking south).
3	Crest (looking north).
4	Downstream face.
5	Drop inlet spillway.
6	Outlet pipe (downstream end).
7	Outlet pipe (close-up).
8	House (mile 0.2).



SHARPE'S POND DAM
KEY PLAN OF PHOTOGRAPHS
FIELD INSPECTION DATE NOV 21 1980

DAPPOLONIA

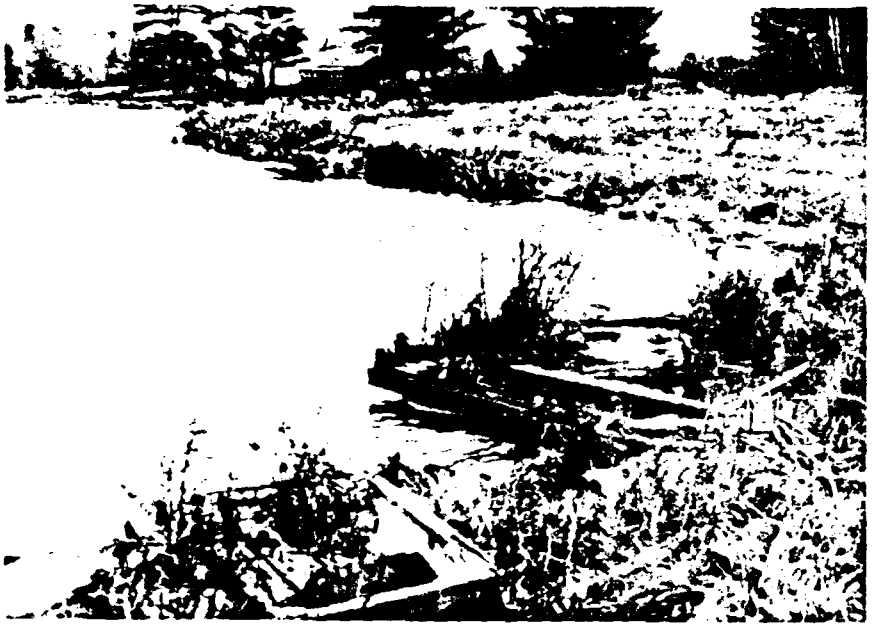
PHOTOGRAPH NO. 1



PHOTOGRAPH NO. 2

PHOTOGRAPH NO. 3

PHOTOGRAPH NO. 4



PHOTOGRAPH NO. 5

PHOTOGRAPH NO. 6

PHOTOGRAPH NO. 7

PHOTOGRAPH NO. 8

APPENDIX D

HYDROLOGY AND HYDRAULICS ANALYSES

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Sharpe's Pond Dam

PROBABLE MAXIMUM PRECIPITATION (PMP) = 22.0 INCHES/24 HOURS

STATION	1	2	3	4	5
Station Description	Sharpe's Pond Reservoir	Sharpe's Pond Dam			
Drainage Area (square miles)	0.99	-			
Cumulative Drainage Area (square miles)	0.99	0.99			
Adjustment of PMF for Drainage Area (%)(1)	97%				
6 Hours	117	-			
12 Hours	127	-			
24 Hours	136	-			
48 Hours	145	-			
72 Hours	-	-			
Snyder Hydrograph Parameters					
Zone(2)	11	-			
C_p/C_t(3)	0.62/1.5	-			
L (miles)(4)	1.23	-			
L_{ca} (miles)(4)	0.44	-			
$t_p = C_t(L \cdot L_{ca})^{0.3}$ (hours)	1.24	-			
Spillway Data					
Crest Length (ft)	-	9.4 (perimeter length)			
Freeboard (ft)	-	1.1			
Discharge Coefficient	-	Varies			
Exponent	-	1.5			

(1) Hydrometeorological Report 40, U.S. Weather Bureau, 1965.
(2) Hydrological zone defined by Corps of Engineers, Baltimore District, for determining Snyder's Coefficients (C_p and C_t).
(3) Snyder's Coefficients.
(4) L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

STORAGE VS. ELEVATION

ELEVATION	ΔH, FEET	AREA (acres)(1)	ΔVOLUME (acre-feet)(2)	STORAGE (acre-feet)
1140		56.0		502.0
1135(3) (Spillway crest El.)	5	45.0	252.0	250.0
	-	-	250.0(3)	0

(1) Planimetered from USGS maps.
(2) $\Delta Volume = \Delta H/3 \, (A_1 + A_2 + \sqrt{A_1 A_2})$.
(3) Estimated.

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  01 APR 80
**********
    1                A1       SNYDER UNIT HYDROGRAPH,DAM OVERTOPPING ANALYSIS
    2                A2       SHARPE'S POND,(DER I.D. 66-09) WYOMING COUNTY,PA.   PROJECT NO.80-[illegible]
    3                A3       FOR 20%,30%,40%,50%,60%,70%,80%,90%,AND 100% PROBABLE MAXIMUM FLOOD(PMF)
    4                B     300        0       12        0        0        0        0        0       -4        0
    5                B1      5
    6                J       1        9        1
    7                J1   0.20     0.30     0.40     0.50     0.60     0.70     0.80     0.90     1.00
    8                K       0        1                                             1
    9                K1       CALCULATION OF SNYDER INFLOW HYDROGRAPH TO SHARPE'S POND,(DER 66-09)
   10                M       1        1     0.99              0.99                                    1
   11                P                21.5      117      127      136      145
   12                T                                                           1.0      0.5             0.0709
   13                W    1.24     0.62
   14                X    -1.5    -0.05      2.0
   15                K       1        2                                             1
   16                K1       ROUTING FLOW THROUGH SHARPE'S POND,(DER 66-09)
   17                Y                                         1        1
   18                Y1      1                                                -1135.0       -1
   19                Y41135.0  1135.2   1135.4   1135.6   1135.8   1136.0 1136.13   1137.0   1138.0   1138.5
   20                Y41139.0 1139.54   1140.0   1141.0   1142.0   1143.0
   21                Y5   0.00      2.7      7.6     14.0     21.6     30.2     36.2     48.1     59.0     65.7
   22                Y5   68.1     72.5     73.3     75.0     76.7     78.3
   23                $A   45.0     56.0     99.2
   24                $E1135.0   1140.0   1160.0
   25                $$1135.0
   26                $D1136.1     2.65      1.5    525.0
   27                $L  100.0    150.0    200.0    250.0    300.0    350.0    450.0    475.0    513.0    525.0
   28                $V1136.1   1136.2   1136.5   1136.9   1137.0   1137.1   1137.2   1137.4   1139.2   1141.3
   29                K      99
```

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1135.00	1135.00	1136.10
STORAGE	0.	0.	51.
OUTFLOW	0.	0.	55.

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
.20	1136.88	.78	89.	432.	9.40	41.80	0.00
.30	1137.19	1.09	104.	764.	10.80	41.40	0.00
.40	1137.40	1.30	114.	1098.	12.00	41.20	0.00
.50	1137.56	1.46	122.	1411.	12.80	41.00	0.00
.60	1137.71	1.61	130.	1720.	13.40	41.00	0.00
.70	1137.84	1.74	136.	2022.	14.00	41.00	0.00
.80	1137.96	1.86	143.	2322.	14.60	41.00	0.00
.90	1138.08	1.98	149.	2620.	15.00	41.00	0.00
1.00	1138.19	2.09	154.	2918.	15.40	41.00	0.00

*Low area on left abutment.

RATIO OF PMF	MAXIMUM DEPTH OVER DAM**
20	0.18
30	0.49
40	0.70
50	0.86
60	1.01
70	1.14
80	1.26
90	1.38
100	1.49

**Elevation low area on dam 1136.7.

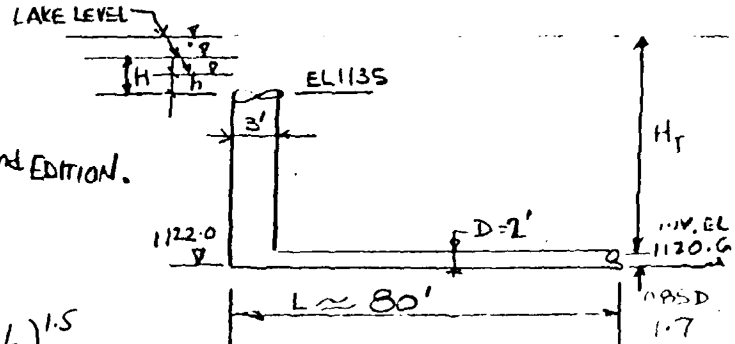
PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS								
				RATIO 1 .20	RATIO 2 .30	RATIO 3 .40	RATIO 4 .50	RATIO 5 .60	RATIO 6 .70	RATIO 7 .80	RATIO 8 .90	RATIO 9 1.00
HYDROGRAPH AT	1	.99	1	603.	904.	1206.	1507.	1808.	2110.	2411.	2713.	3014.
	(	2.56)	(	17.07)(	25.60)(	34.14)(	42.67)(	51.21)(	59.74)(	68.28)(	76.81)(	85.35)
ROUTED TO	2	.99	1	432.	764.	1098.	1411.	1720.	2022.	2322.	2620.	2918.
	(	2.56)	(	12.22)(	21.63)(	31.09)(	39.95)(	48.70)(	57.26)(	65.75)(	74.20)(	82.64)

DAPPOLONIA
CONSULTING ENGINEERS, INC.

By WTC Date 1-13-81 Subject SHARPE'S POND Sheet No 5 of 6
Chkd. By DJC Date 1/15/81 SPILLWAY DISCHARGE CAPACITY Proj. No. 80-556-0

SPILLWAY DISCHARGE CAPACITY



REFERENCE · DESIGN OF SMALL DAM 2nd EDITION.

FOR WEIR FLOW CONTROL

$$Q_W = C L h^{1.5} = (3.2)(\pi)(3)(h)^{1.5}$$
$$= 30.16\, h^{1.5} = 30.16\,(\text{LAKE ELEV} - 1135)^{1.5} \quad -(\text{EQ } 1)$$

FOR ORIFICE FLOW CONTROL

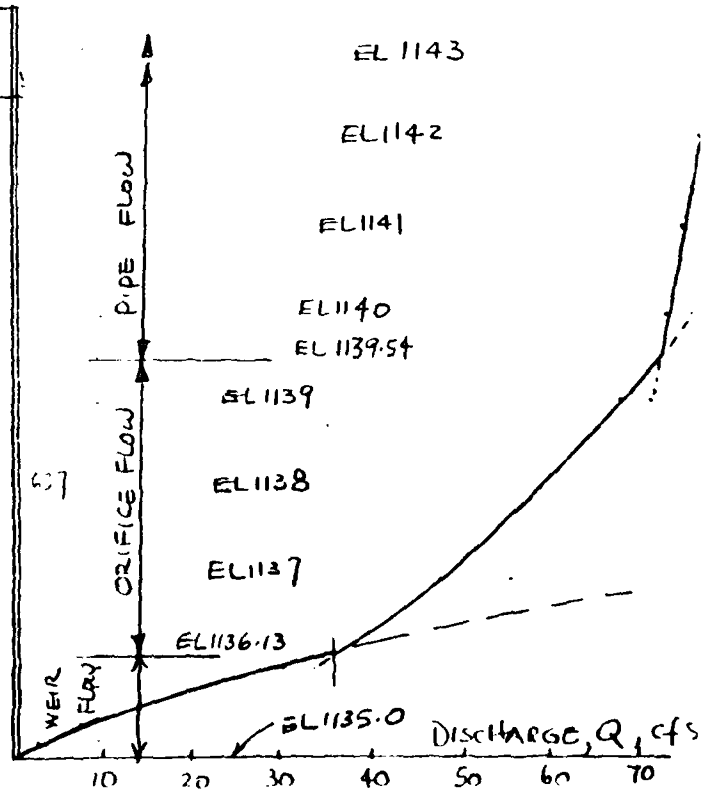
$$Q_o = C_o A \sqrt{2gH} = (0.6)\left(\frac{\pi 3^2}{4}\right)(64.4)^{1/2}\sqrt{H} = 34.04\sqrt{H} = 34.04\sqrt{\text{LAKE EL} - 113\ldots} \quad (\text{EQ } 2)$$

FOR PIPE FLOW CONTROL

$$H_T = \left[\frac{2.5204(1+K_e)}{D^4} + \frac{466.18\, n^2 L}{D^{16/3}}\right]\left(\frac{Q_p}{10}\right)^2 = \left[\frac{2.5204(1.5)}{(2)^4} + \frac{(466.18)(0.013)^2(30)}{(2)^{16/3}}\right]\left(\frac{Q_p}{10}\right)^2$$

$$Q_p = 15.96\sqrt{H_T} = 15.96\sqrt{\text{LAKE EL.} - 1120.6 - 0.85(2)} = 15.96\sqrt{\text{LAKE EL} - 1118.9} \quad (\text{EQ } 3)$$

LAKE ELEVATION	Q_w cfs	Q_o cfs	Q_p cfs	SPILLWAY CAPACITY Q, cfs
1135.0	0	0	0	0
1135.2	2.7			2.7
1135.4	7.6			7.6
1135.6	14.0			14.0
1135.8	21.6			21.6
1136.0	30.2	34.0		30.2
1136.13	36.2	36.2		36.2
1137.0	85.3	48.1		48.1
1138.0		59.0		59.0
1139.0		68.1	71.6	68.1
→ 1139.54		72.5	72.5	72.5
1140.0		76.1	73.3	73.3
1141.0			75.0	75.0
1142.0			76.7	76.7
1143.0			78.3	78.3



APPENDIX E

PLATES

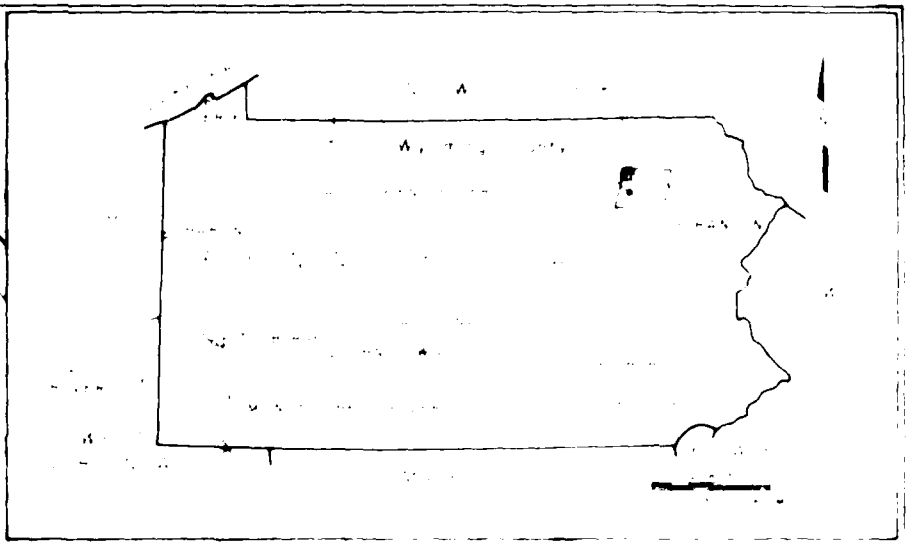
DRAWN BY	ACS	CHECKED BY		2-17-81	DRAWING NUMBER 80-556-B1
	12-2-80	APPROVED BY		2-17-81	

APPROXIMATE
WATERSHED AREA

REFERENCES

1. U.S.G.S. JENNINGSVILLE, PA. QUADRANGLE
   PHOTOREVISED 1969, SCALE 1:24000
2. USGS. MESHOPPEN, PA. QUADRANGLE
   PHOTOREVISED 1969, SCALE 1:24000

0 2



KEY PLAN

SCALE

0 2000 4000 6000 8000 10000 FEET

DIAPPOLONIA

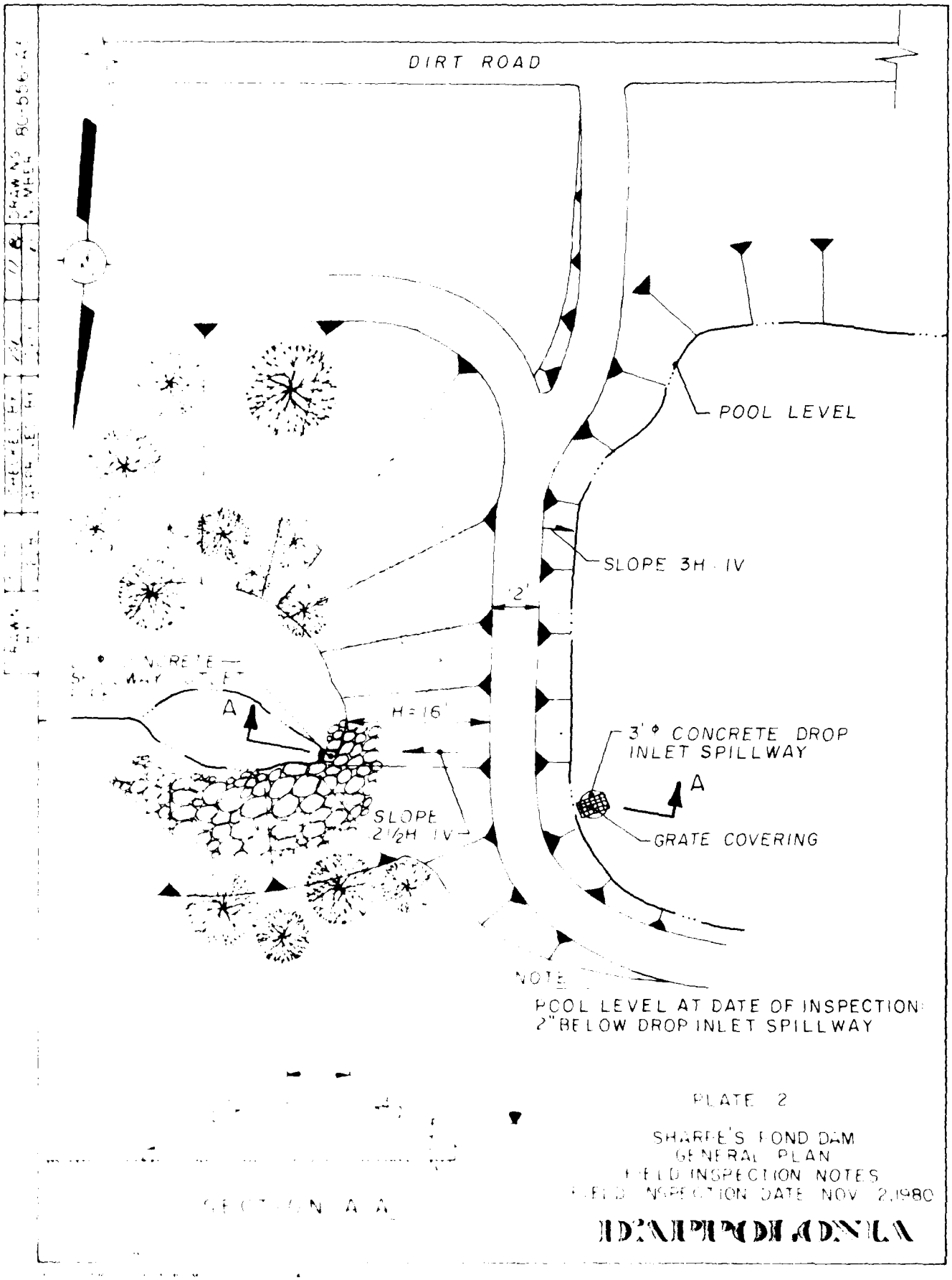


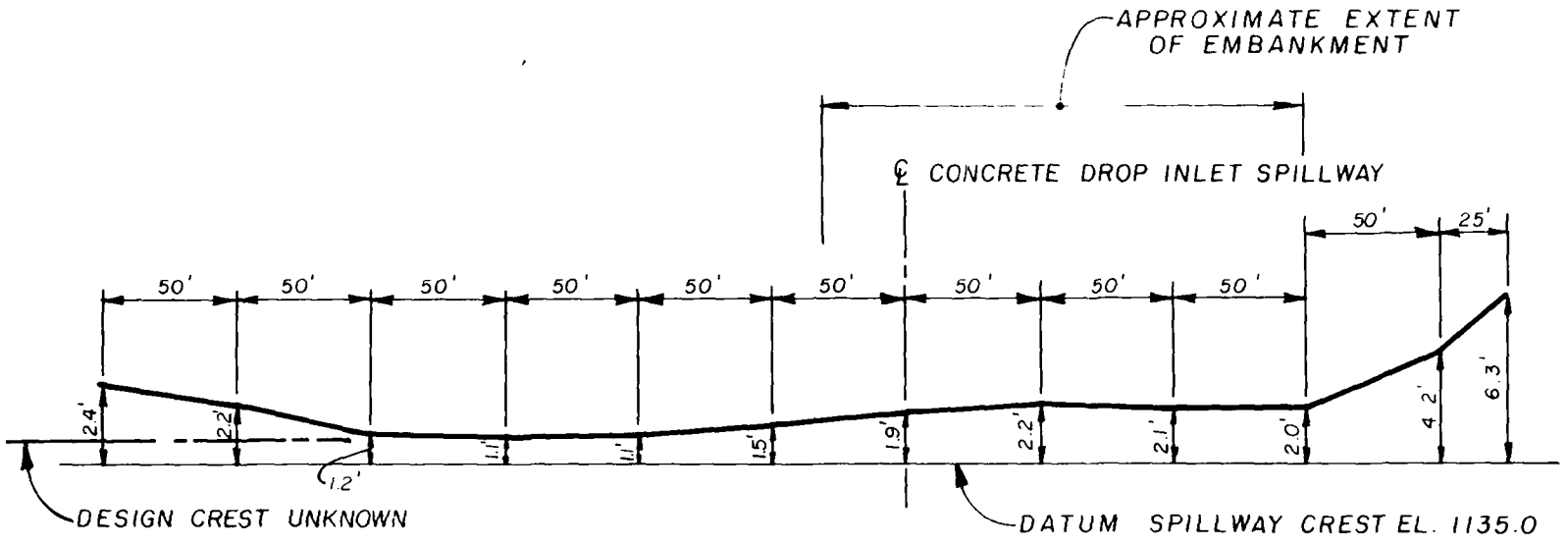
PLATE 2

SHARPE'S POND DAM
GENERAL PLAN
FIELD INSPECTION NOTES
FIELD INSPECTION DATE NOV 2,1980

SECTION A-A

DAMBROOK

DRAWN BY	sh	CHECKED BY			DRAWING NUMBER 80-556-A6
	12/28/80	APPROVED BY			



DAM CREST PROFILE
(LOOKING DOWNSTREAM)

NOTES

1. DAM CREST WAS SURVEYED RELATIVE TO SPILLWAY CREST LEVEL.
2. DATUM ELEVATION PER U.S.G.S. MAPS

PLATE 3

SHARPE'S POND DAM
DAM CREST SURVEY
FIELD INSPECTION DATE: NOV. 12, 1980

APPENDIX F

REGIONAL GEOLOGY

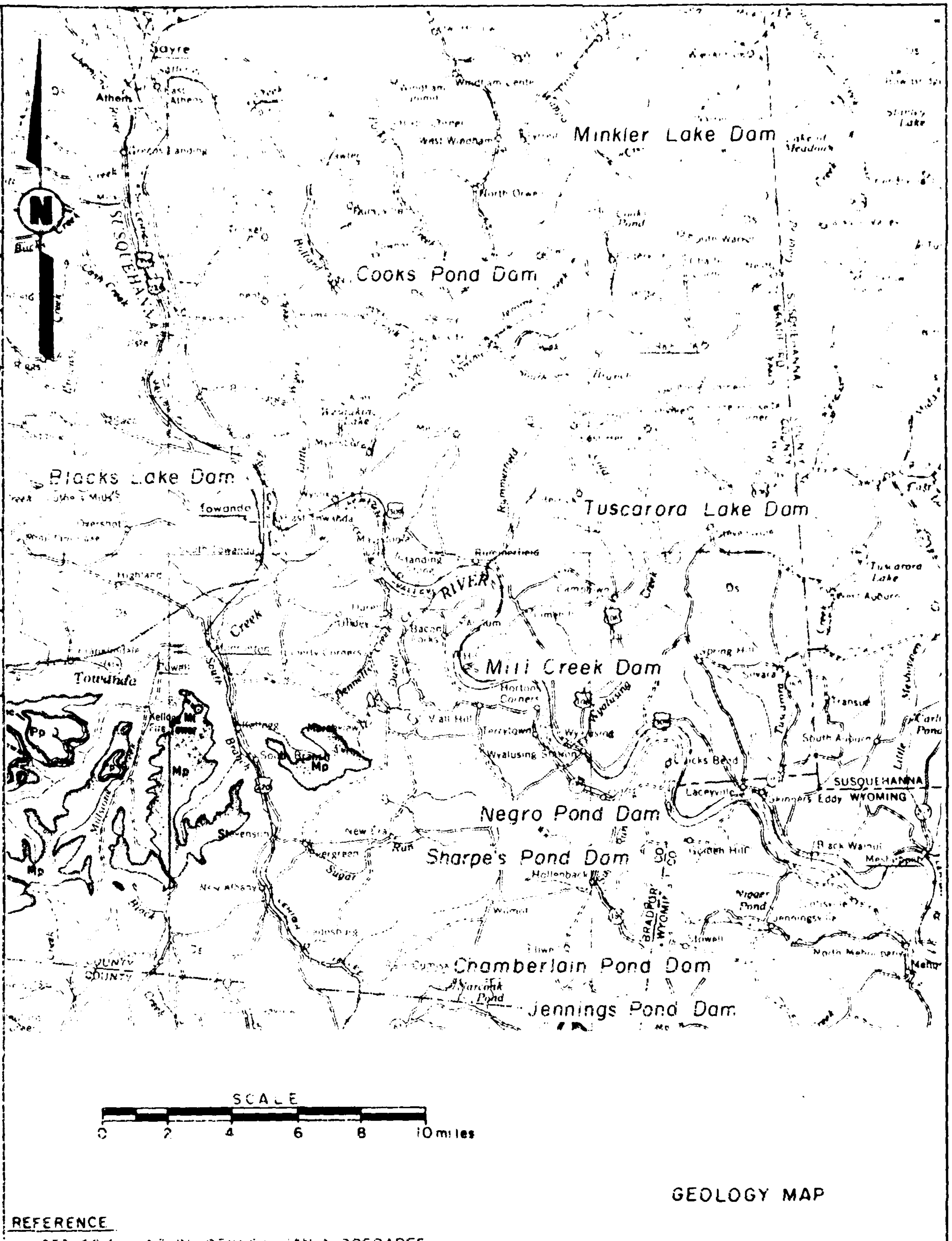
REGIONAL GEOLOGY
NEGRO POND, SHARPE'S POND, CHAMBERLAIN POND AND JENNINGS POND DAMS

The Negro Pond, Sharpe's Pond, Chamberlain Pond, and Jennings Pond dams are located in the glaciated low plateaus section of the Appalachian Plateau physiographic province, characterized as a mature glaciated plateau of moderate relief.

The geologic structure consists of a series of northeast trending folds (approximately N70°E) which plunge gently to the southwest. The dip of the limbs of the folds in the vicinity of the dams is less than five degrees, with the southeast limb steeper than the northwest limb. The dams are located south of the Wilmot Anticline. In general, the discontinuity trends are northeast and northwest.

The stratigraphy consists of glacial till which will range in thickness from very thin to approximately 200 feet. The glacial till is underlain by the Devonian Chemung Formation, which is approximately 475 feet thick in this area. The Chemung Formation is marine in origin, consisting of green-gray sandstone, multicolored shale, and sandy shale. The shale strata tend to weather rapidly when exposed.

DRAWN BY	ACS	1-2-81	CHECKED BY		2-17-81	DRAWING NUMBER	80-556-A3
			APPROVED BY		2-17-81		



SCALE

0 2 4 6 8 10 miles

GEOLOGY MAP

REFERENCE

GEOLOGIC MAP OF PENNSYLVANIA PREPARED BY COMMONWEALTH OF PENNA. DEPARTMENT OF ENVIRONMENTAL RESOURCES DATED 1960 SCALE 1:250,000

D'APPOLONIA

DRAWN BY	ACS	CHECKED BY		2-17-81	DRAWING NUMBER 80-556-A4
	1-2-81	APPROVED BY		2-17-81	

PENNSYLVANIAN

APPALACHIAN PLATEAU

Ps — Allegheny Group

Pp — Pottsville Group

ANTHRACITE REGION

Pp — Pottsville Group

MISSISSIPPIAN

Mmc — Mauch Chunk Formation

Mp — Pocono Group

DEVONIAN

UPPER

CENTRAL AND EASTERN PENNSYLVANIA

Doc — Oswayo Formation

Dck — Catskill Formation

Ds — Susquehanna Group

Marine beds

GEOLOGY MAP LEGEND

REFERENCE

GEOLOGIC MAP OF PENNSYLVANIA PREPARED BY COMMONWEALTH OF PENNA, DEPARTMENT OF ENVIRONMENTAL RESOURCES DATED 1960
SCALE : 250 000

D'APPOLONIA


DA
FIL